

ALTERNATIVES

Testimony of Susan V. Lee

SUMMARY OF FINDINGS

In the analysis of individual resource areas, the Final Staff Assessment identifies potential adverse impacts of the proposed San Francisco Electric Reliability Project air quality, cultural resources, hazardous materials management, land use, noise, and public health. Based on these and other concerns, this section evaluates six alternatives in detail. An additional 24 alternatives were considered but eliminated from detailed analysis. The alternatives analyzed in detail include three site alternatives (involving construction of the three turbines in a different location) at Brisbane, San Francisco International Airport, and East Bay alternative sites, two project alternatives (the Trans Bay Cable Project and the Potrero Power Plant Unit 7 Project), and the No Project Alternative.

Among the project alternatives analyzed, the alternative considering construction of Potrero Power Plant Unit 7 has the potential for greatest impacts. Of the alternative sites evaluated, the Brisbane Alternative has the potential for greatest impacts and would have greater impacts in comparison with the proposed San Francisco Electric Reliability Project in the issue areas of noise, land use, traffic, visual resources, and water and soils, as well as concerns relating to transmission system engineering and transmission safety and nuisance.

The Trans Bay Cable Project, the Brisbane site, San Francisco International Airport, and East Bay Alternatives would fail to meet a major project objective: closing aging in-City generation, i.e., releasing Potrero Units 3 through 6 from applicable RMR contracts. Because these alternatives would not result in generation within the City and County of San Francisco, they would not meet California Independent System Operator requirements for generation to be “north of Martin Substation.” The Trans Bay Cable Project would likely have the least environmental impacts overall (primarily because, as a transmission project, its operational impacts would be minor), but construction of this project would result in greater impacts than the proposed project to aquatic biological resources, water and soil, traffic, geological resources, and transmission line safety and nuisance impacts. However, without the ability to cause closure of in-City generation facilities, the overall impacts of the Trans Bay Cable Project would be greater than those of the San Francisco Electric Reliability Project.

Staff also believes that, overall, the No Project Alternative is not superior to the proposed project. This scenario would likely delay the closure of the Potrero Power Plant Units 3 through 6, which are objectives of the proposed San Francisco Electric Reliability Project and are older plants with have relatively higher air emissions. The No Project Alternative would also result in reduced reliability for San Francisco’s electrical supply.

INTRODUCTION

The purpose of staff's alternatives analysis is to consider whether there are alternatives that could feasibly attain most of the basic objectives of the project and avoid or substantially lessen one or more of the significant effects of the project. If the Energy Commission determines that the proposed project will result in significant adverse impacts and identifies an alternative that meets these criteria, it cannot license the project unless it finds that the benefits of the project outweigh the impacts and that the alternative is infeasible. However, the Energy Commission does not have the authority to approve alternative configurations, require alternative technology designs, or to require the applicant to move the proposed project to another location without first conducting a more in-depth review of the environmental consequences of the alternative. If the applicant moves its proposed project to one of the alternative sites, Energy Commission staff will analyze any new proposed site to the same level of detail as the original proposed site. In addition, Energy Commission staff is required by agency regulations to examine the "feasibility of available site and facility alternatives to the applicant's proposal which substantially lessen the significant adverse impacts of the proposal on the environment" (Cal. Code Regs., tit. 20, §1765).

The Energy Commission is the permitting agency and "lead agency" for thermal power plants in California over 50 MW. It provides an environmental assessment of proposed projects pursuant to a regulatory program certified by the Secretary of Resources pursuant to the California Environmental Quality Act (CEQA). The Commission's certified regulatory program is exempt from the requirement that it prepare an Environmental Impact Report (EIR). However, its environmental analysis must meet many basic CEQA requirements. When it prepares its analysis of project alternatives, staff follows the basic tenets of the CEQA Guidelines in the development of its analysis.

The CEQA Guidelines provide further direction by requiring an evaluation of the comparative merits of "a range of reasonable alternatives to the project, or to the location of the project, which would feasibly attain most of the project objectives" (Cal. Code Regs., tit. 14 §15126.6). The analysis should identify and compare the impacts of the various alternatives, but analysis of alternatives need not be in as much detail as the analysis of the proposed project.

In order to provide a comprehensive evaluation, staff's analysis considers a full range of alternatives. This section presents a summary of alternatives that were considered in two previous Energy Commission proceedings for San Francisco power plants: the 1994 proposal by the San Francisco Energy Corporation (SFEC; 94-AFC-1) and the 2000 Potrero Power Plant Unit 7 Project (00-AFC-4). The analysis also considers alternatives studied in the California Public Utilities Commission's (CPUC) Jefferson-Martin 230 kV Transmission Project Final Environmental Impact Report (CPUC 2003). In addition to information from these proceedings, this section evaluates other alternatives recommended by the public and those developed by staff.

Organization of This Section. The body of the analysis explains the analysis methodology used for alternatives and summarizes the conclusions of this section. Three appendices follow this Final Staff Assessment (FSA) section:

- Appendix A presents environmental evaluation of the six selected alternatives (by environmental issue area).
- Appendix B presents the explanation of alternatives eliminated from detailed analysis.
- Appendix C presents supporting documentation (letters between the CCSF and the CA ISO and the San Francisco Action Plan).

APPROACH

This alternatives analysis uses the following approach, based on guidance in the CEQA Deskbook (1999):

1. Describe the project objectives.
2. Assess the proposed project's significant environmental effects.
3. Develop screening criteria for feasibility of alternatives.
4. Consider a broad range of alternatives, including the No Project Alternative, and select a reasonable range of alternatives that:
 - Meet some or all of the project objectives.
 - May be located on alternatives sites.
 - Substantially avoid or lessen one or more of the potential significant effects of the project; and
 - Are feasible based on specific economic, social, legal, or technical considerations.
5. Explain why other alternatives have been rejected from evaluation (Appendix B).
6. Provide meaningful evaluation and analysis of environmental impacts of the reasonable range of alternatives and the No Project Alternative in comparison with environmental effects of the proposed project (Appendix A).
7. Identify the environmentally superior alternative.

SUMMARY DESCRIPTION OF PROPOSED PROJECT

The proposed SFERP would consist of a nominal 145-megawatt (MW) simple-cycle plant, using three natural gas-fired General Electric LM 6000 gas turbines and associated infrastructure. Each CTG would generate a nominal 48 MW with the use of chillers. The project site is located near the San Francisco Bay in the Potrero District of San Francisco, on a four-acre site of City-owned land (see **ALTERNATIVES Figure 1** in

Appendix A). The project would include the construction of a new air-insulated 115-kilovolt (kV) switchyard on the north side of the site adjacent to 25th Street. A detailed description of the proposed SFERP is included in the Project Description section of this Staff Assessment.

BASIC OBJECTIVES OF THE PROJECT

The applicant has identified several basic objectives in the AFC, consistent with the findings and recommendations contained in its Electricity Resource Plan (ERP), for the development of the proposed power project. These objectives are:

1. Improve CCSF's electricity reliability;
2. Facilitate the shutdown of older, more polluting in-City generation; and
3. Minimize local impacts of electrical generation.

The CCSF, PG&E, and the California Independent System Operator (CA ISO) have extensively studied the electrical infrastructure in the CCSF. The applicant and CA ISO state in the San Francisco Action Plan¹ and related documents that SFERP is needed, as part of a portfolio of resources, to maintain system reliability and provide for closure of existing power plants (Edwards 2004a and 2004b). The applicant states that it is committed to maximizing energy efficiency improvements, developing renewable power, encouraging clean distributed generation and supporting needed transmission additions. Nonetheless, the siting of new, clean and operationally flexible generation is also considered necessary to provide for the near-term closure of the Hunters Point Power Plant and to address operational needs. The SFERP will also, in the longer term, facilitate the closure of units at the Potrero Power Plant.

POTENTIAL SIGNIFICANT ENVIRONMENTAL IMPACTS AND AREAS OF IDENTIFIED PUBLIC CONCERN

In this FSA, staff has identified that the SFERP has the potential to cause significant impacts to air quality, cultural resources, hazardous materials management, land use, noise, and public health. However, following the implementation of recommended mitigation, all impacts are expected to be reduced to less than significant levels. Staff's detailed assessments of the expected environmental consequences of the proposed project are discussed in the individual technical sections of the FSA. The following paragraphs summarize the areas of concern.

- **Air Quality.** The community has expressed concerns regarding the dispatch hours and the appropriate location for taking monitoring samples, about the cumulative air impacts of the project and air quality modeling predicts that the impacts for PM10 and PM2.5 would be greatest along the fence line of the facility. Since the public has access up to the property fence, additional mitigation beyond those proposed in the

¹ The San Francisco Action Plan was developed by the CA ISO working with the City of San Francisco and other stakeholders to establish the conditions upon which the existing generation at Hunters Point and Potrero would be released from RMR contracts. The San Francisco Action Plan involves the successful completion of a total of 12 transmission projects by PG&E, four peaking power plants by CCSF, and the Mirant retrofit of Potrero Unit 3 with emissions control technology for its temporary operation. The CA ISO does not control the dates of completion of these projects, nor does it control the permanent shutdown of the Hunters Point and Potrero generation.

AFC may be required to mitigate these impacts. However, Staff finds that, with the inclusion of the Conditions of Certification, the proposed project would be in compliance with all applicable laws, ordinances, regulations, and standards and would not result in any significant air quality-related impacts.

- **Cultural Resources.** Members of the Native American community have expressed concerns regarding development along the Bay. In addition, Staff initially identified the potential impact of vibrations from the construction of trenches on historic buildings within one block on either side of proposed trenches required for the underground transmission line, especially along 3rd Street between 20th and 23rd Streets. There is also a potential for the presence of prehistoric archaeological resources on the process water pipeline route. However, overall Staff determined that there would be no impact on significant historic standing structures, historic districts, or ethnographic resources. Impacts to archaeological resources will be discussed at a later time, when the applicant provides two reports on the archaeological survey of portions of the impact area, projected for September 14, 2005 (Carrier 2005). When the reports are received and the cultural resources inventory is complete, the analysis of SFERP's potential impacts to archaeological resources will be completed and mitigation measures proposed for all impacts that are potentially significant.
- **Hazardous Materials Management.** The community is concerned about the impact of increased hazardous materials in their neighborhood; specifically, the impacts from the transportation of aqueous ammonia. Using treated wastewater for cooling the SFERP has been raised as a local public health concern to the immediate area and secondary impacts to the community near the Southeast Water Pollution Control Plant (SEWPCP). However, Staff's evaluation of the proposed project (with Staff's proposed mitigation measures) had determined that hazardous materials use would not present a significant impact to the public.
- **Land Use.** Conflicts may result between new housing proposed in community plans (i.e., Draft Central Waterfront Neighborhood Plan, South Bayshore Area Plan, and the Draft Bayview Hunters Point Redevelopment and Rezoning Project) and the expansion of long established industrial uses, such as power plants. Current and draft land use plans encourage new residential development as well as other industrial uses such as the cruise ship dry dock facility. However, Staff has found that the project will comply with all applicable land use laws, ordinances, regulations and standards and the proposed power plant will be compatible with existing and planned land uses.
- **Noise.** The project would increase noise levels in the project area. However, Staff finds that, with the inclusion of the Conditions of Certification, the proposed project would be in compliance with all applicable laws, ordinances, regulations, and standards and would not result in any significant noise-related impacts.
- **Public Health.** Public health impacts from air pollution generated by power plants are a major concern to the surrounding community. Concerns have been expressed by members of the community that the potential air quality impacts from the SFERP could exacerbate known health problems, including asthma rates in children. Specific mitigation measures have been requested by the community to address impacts to air quality with a program that is implemented locally. However, Staff does not

expect there would be any significant adverse cancer, or short - or long-term noncancer health effects from project toxic emissions if the proposed Conditions of Certification in this section and the Air Quality section are implemented.

IDENTIFICATION AND SCREENING OF ALTERNATIVES

Staff used a two-stage process to select alternatives for analysis. First a reasonable range of alternatives was identified, and then these alternatives were screened to select those that qualified for detailed evaluation. Staff considered alternatives to the project that were identified by several sources, including the applicant, members of the public, previous environmental documents, and other Energy Commission staff.

The following sections first describe alternatives suggested by the applicant, followed by alternative sites identified by the public and sites identified by staff. Appendix A presents analysis of six alternatives:

- Three site alternatives (involving construction of the three turbines in a different location): the Brisbane, San Francisco International Airport, and East Bay alternative sites.
- Two project alternatives: the Trans Bay Cable Project and the Potrero Power Plant Unit 7 Project.
- The No Project Alternative.

Appendix B describes alternatives that were eliminated from detailed consideration and presents an explanation of why these alternatives are not analyzed. Alternatives that were eliminated from detailed consideration are:

- Thirteen site alternatives (three sites are retained for full analysis).
- Two transmission alternatives (one transmission alternative is retained for full analysis).
- Renewable resources (solar, wind, biomass, tidal, geothermal).
- Demand side management.
- Distributed generation.
- Integrated resources alternative.

ALTERNATIVES Table 1 lists all alternatives identified in this analysis, and states whether each is considered for detailed evaluation.

**ALTERNATIVES Table 1
Alternatives Considered**

Alternative	Qualify?	If Not, Why Not?
TECHNOLOGY ALTERNATIVES		
Demand Side Management	No	Already factored into electrical system planning
Distributed Generation	No	Technological, market, and regulatory barriers, as well as feasibility and timeliness concerns. Some types could cause significant environmental impacts and would not be consistent with project objectives
Renewable Resources	No	Feasibility and availability concerns. Some types could cause significant environmental impacts and would not be consistent with project objectives
Integrated Resource Alternative	No	Feasibility and reliability concerns
ALTERNATIVE SITES		
Applicant's Alternative Sites		
Cesar Chavez Site	No	No environmental benefit compared to proposed
Mirant Site	Yes	Considered as Potrero Power Plant Unit 7 in Appendix A
Illinois Street Site	No	No environmental benefit compared to proposed
Pier 70 Site	No	Greater impacts to historic resources; closer to residences
Western Pacific Site	No	Site would be laydown area for proposed SFERP; located on Port property with planned land use and public trust doctrine incompatibility issues
Larkin Substation vicinity	No	No space available
Mission Substation vicinity	No	No space available; proximity of residences
Hunters Point Substation vicinity	No	Proximity of residences
Alternative Sites Identified by the Public		
Smaller Sites	No	Insufficient space or generation capacity for 3 turbines; potentially greater impacts
SF Airport Area	Yes	Considered as SFIA Alternative in Appendix A
NRG Steam Plant (Fifth & Jessie Streets)	No	Nearby residences; insufficient space for 3 turbines; cost prohibitive
Treasure Island	No	Incompatible land use and inadequate infrastructure (transmission lines, natural gas)
The Presidio	No	Visual and recreation impacts, incompatible land use, lack of infrastructure; and policy inconsistency with NPS
Alternative Sites Considered in the SFEC FSA		
Innes Avenue	No	No environmental benefit compared to proposed
City Asphalt Plant	No	Too small for 3 turbines
SF Thermal Plant	No	Too small for 3 turbines
Hunters Point Power Plant	No	No environmental benefit; incompatible land use due to residences nearby
China Basin Stadium Site	No	Unavailable due to Mission Bay development underway
Mission Bay Development	No	Unavailable due to Mission Bay development underway
Rail Yard South of China Basin	No	Unavailable due to Mission Bay development underway
Cow Palace, Daly City	No	No environmental benefit (residential developments

Alternative	Qualify?	If Not, Why Not?
		now surround available land)
Treasure Island	No	Inadequate infrastructure (transmission lines, natural gas) and geotechnical concerns related to building on fill
Hunters Point Naval Shipyard	No	Development plans underway for residential and other uses
West of PG&E's Martin Substation, Daly City	No	Inadequate land now available due to residential development
Tuntex Site, Brisbane	Yes	Considered as Brisbane Alternative in Appendix A
Alternative Sites Considered in the Potrero Power Plant Unit 7 FSA		
Cargo Way Site	No	No environmental benefit compared to proposed
Gilman Avenue	No	Proximity of residences
Jamie Court, South San Francisco	No	Similar to SFIA Alternative
United Site at SFIA	Yes	Considered as SFIA Alternative in Appendix A
3Com Park Area: Carroll Avenue	No	No environmental benefit compared to proposed
South San Francisco: Belle Air Road	No	Inadequate land available
3Com Park, San Francisco	No	Timing of availability uncertain
Alternative Sites/Projects Identified by Staff		
East Bay Alternative, Hayward	Yes	Considered in Appendix A
Potrero Unit 7 Power Plant (as proposed by Mirant)	Yes	Considered in Appendix A
Trans Bay Cable	Yes	Considered in Appendix A

CONSIDERATION OF ALTERNATIVE SITES

BACKGROUND

During the CCSF's siting process, CCSF and the CA ISO engaged in discussions regarding reliable electricity service to CCSF and the requirements for closure of existing in-City generation. As a result of the correspondence, it is CCSF's position that the SFERP should clearly provide for closure of Hunters Point Power Plant (Units 1 and 4) in the event that the Jefferson-Martin transmission line² and related transmission projects are not placed in service. It is also CCSF's position that if the Jefferson-Martin line and associated transmission projects (set forth in a May 4, 2004, letter from PG&E to the CA ISO) provide for closure of the Hunters Point Power Plant (Units 1 and 4), then the SFERP should provide for closure of generating units at the existing Potrero Power Plant complex (SFERP 2004aa).

Prior to the May 4, 2004, letter, in making decisions about alternatives to site the SFERP, CCSF relied on the following four communications from the CA ISO, the first three of which are included in Appendix C to this Alternatives section:

1. An April 18, 2003, letter from CA ISO President and CEO Terry M. Winter to Theresa Mueller, Deputy City Attorney, City and County of San Francisco, and Kevin Dasso of PG&E;
2. An October 22, 2003, letter from CA ISO President and CEO Terry M. Winter to San Francisco Supervisor Sophie Maxwell;

² The Jefferson-Martin 230 kV Transmission Project was approved by the California Public Utilities Commission on August 19, 2004. Construction is underway and is expected to be completed in April 2006.

3. A matrix entitled "ISO Grid Planning Draft" forwarded by CA ISO staff to the San Francisco Public Utilities Commission (SFPUC) on February 9, 2004; and
4. A statement by CA ISO planning staff at a March 4, 2004, hearing before the City Services Committee of the San Francisco Board of Supervisors (SFERP 2004q).

The attachments to the April 18, 2003, and October 22, 2003, letters indicated that to allow for the shut down of units at Hunters Point Power Plant, the combustion turbines must be "electrically connected to the internal San Francisco 115kV transmission network."

The April 18, 2003, letter set forth the requirements to shut down Hunters Point Power Plant Unit 4, absent the Jefferson-Martin 230 kV Transmission Project, and indicates that four combustion turbines and six transmission projects would be required. The October 22, 2003, letter sets forth the requirements to shut down Hunters Point Power Plant Units 1 and 4, absent the Jefferson-Martin project, and indicates that four combustion turbines and eight transmission projects would be required. Furthermore, with both the SFERP and the Jefferson-Martin line in place, along with related transmission upgrades, the SFERP should, based on numbers set forth in the October 22, 2003, letter, at least provide for the additional closure of Potrero Units 4, 5 and 6.

The February 9, 2004, matrix indicates that Hunters Point Power Plant Units 1 and 4 could be shut down (absent the Jefferson-Martin transmission line), with three combustion turbines and the same eight other transmission projects. This information was confirmed by CA ISO planning staff at the March 4, 2004, hearing before the City Services Committee of the San Francisco Board of Supervisors. On May 28, 2004, San Francisco Mayor Gavin Newsom and Supervisor Sophie Maxwell wrote to CA ISO to request additional information about the ability to shut down in-City generation (including Potrero Power Plant Unit 3) in various scenarios. CCSF received a response to this letter on July 1, 2004 (from Jim Detmers, CA ISO Acting Chief Operations Officer to San Francisco Mayor Newsom, Supervisor Maxwell, and others; also included in Appendix C). CCSF has continued to forcefully press the CA ISO to define the conditions that would allow closure of Potrero Power Plant Unit 3.

In CCSF's data response to SF Power, they state that in a meeting between CCSF, community members and the CA ISO, the CA ISO agreed to engage in an expedited six-week process to define such preconditions. Further, on July 29, 2004, Greg Asay on behalf of Supervisor Maxwell reiterated to the CA ISO governing board CCSF's need for concrete and clear information from the CA ISO about the preconditions for closure of in-City generation. Although CCSF cannot guarantee that closure of all older in-City generation will in fact occur, it is the CCSF's objective in pursuing the SFERP to achieve this goal (SFERP 2004aa).

The efforts of CCSF and other stakeholders working with the CA ISO for three years culminated on September 10, 2004, in a presentation to the CA ISO Board of Governors of an Action Plan for San Francisco (SF Action Plan), which provides specific direction on how the old generation at Hunters Point and Potrero could be released from their RMR Agreements, ultimately leading to their retirement (SFPUC 2005a). At that time,

the SF Action Plan showed that the Potrero peakers (Units 4, 5, and 6) would be retired before Potrero Unit 3. The CCSF requested the CA ISO to consider the possibility of retiring Potrero 3 first, followed by the Potrero peakers. The CA ISO evaluated CCSF's request and concluded in October 2004 that this "switch" would be appropriate (DeShazo 2005).

Accordingly, the CA ISO revised the SF Action Plan and on November 10, 2004, the revised Plan was adopted by the Board. The Plan listed a combination of 14 transmission projects and 4 peaking power plants (including the proposed SFERP) that allow the following sequential shutdown of the existing generation (see additional discussion under No Project Alternative and **ALTERNATIVES Table 5** for a list of the required projects) (Edwards 2004a and 2004b):

- **Hunters Point Units 2 & 3:** Completion of one transmission project, which was completed by PG&E in December 2004. These units were released from their RMR Agreements on January 1, 2005.
- **Hunters Point Units 1 & 4:** Completion of seven transmission projects and the retrofit of Potrero Unit 3 (see below); the final project (Jefferson–Martin 230 kV Transmission Project) is scheduled for completion in March 2006. The RMR contracts would be terminated as soon as the remaining transmission projects are deemed completed and in operation (both by PG&E and the CA ISO).
- **Potrero Unit 3:** Completion of Peaking Power Plants (i.e., SFERP and one combustion turbine at the San Francisco International Airport) by CCSF; the scheduled completion is December 2006. Therefore, this unit is planned to be recommended for release from its RMR Agreement in September 2006 for the 2007 RMR Year.
- **Potrero Units 4, 5, & 6:** Completion of four transmission projects and assuming previous completion of the Peaking Power Plants referenced above; PG&E is currently evaluating the project completion dates, but believes they are likely to be scheduled for 2007. Were this to occur, the CA ISO would plan to recommend this units for release from their RMR Agreements in September 2007 for the 2008 RMR year.

PG&E and the CA ISO are implementing the SF Action Plan at this time and expect to be completed by the end of 2007.

ALTERNATIVES ANALYSIS COMPLETED BY THE APPLICANT

CCSF identified and assessed the suitability of several properties for the proposed project that could house different numbers of turbines. A 1998 survey indicates that only 14 percent of the land in the City is zoned as Industrial (SFERP 2004aa). As part of this assessment, it reviewed four siting options. These included siting all four combustion turbines at one site, siting three combustion turbines at one site and one combustion turbine elsewhere, siting two combustion turbines at one site and two elsewhere, and lastly, returning the combustion turbines to the State of California and not siting any combustion turbines (the No Project Alternative). After analyzing these options, CCSF determined that siting multiple combustion turbines at one site offered several advantages, most notably, lower capital and operating costs, and reduced permitting and construction schedules. However, in order to distribute the impacts of power generation

more equitably, the applicant decided to proceed with siting three units at the Potrero site and the fourth 48-MW unit at SFIA. The fourth turbine, known as the S.F. International Airport Power Plant (City of San Francisco Planning Department No. 2004.0384), would be located on approximately 2 acres at the corner of North Access Road and Clearwater Drive (SFIA Plot 20) on a projection of filled land known as North Field, approximately 3,100 feet from the existing United Cogeneration Plant, south of the SFIA Wastewater Treatment Plant and adjacent to and west of City College of San Francisco Aviation College (CCSF 2004).

Sites Near 115 kV Substations

To electrically connect at least three combustion turbines to the internal San Francisco 115 kV transmission network, CCSF staff concluded that considering possible line outages as well as interconnection costs, the best interconnection points would be at one of the existing PG&E 115 kV substations. There are four 115 kV substations in CCSF: Larkin, Mission, Potrero and Hunters Point. The **Larkin Substation** (located near the corner of Larkin and McAllister in the Civic Center area) was eliminated from consideration because there is no industrially zoned land in the vicinity.

While there is some industrial land adjacent to **Mission Substation** (located at Mission Street and 8th/9th Streets), the substation was eliminated from consideration to site three combustion turbines because there was insufficient land to locate multiple combustion turbines in the vicinity or for a construction lay down area, modifications, including seismic retrofits of the masonry buildings, would be necessary, and because of the expense of natural gas interconnection in the area. In addition, the Mission Substation is surrounded by commercial and residential land uses, with a low-income apartment building directly to the west of the site on Minna Street. Use of PG&E's Station I Site on the corner of 8th and Mission, diagonally across from the Mission Substation, was also eliminated for these reasons.

The **Hunters Point Substation** was eliminated from consideration due to environmental justice concerns and land use incompatibility with residences nearby. Specifically, CCSF notes that "communities in the vicinity of Hunters Point Substation (which is immediately adjacent to the Hunters Point Power Plant) have borne and continue to bear the impacts from substantial industrial activity, most notably the Hunters Point Power Plant and the SEWPCP" (SFERP 2004a and SFPUC 2005a). To ameliorate environmental justice concerns, it has been CCSF's objective since 1998 to close Hunters Point Power Plant. Given the longstanding impacts of the Hunters Point Power Plant on the local communities, and continued community concerns about the impacts from SEWPCP, CCSF did not consider siting new generation in the Hunters Point area.

In Section 9 of the AFC, the applicant identified and evaluated five alternative sites for the proposed power plant in the vicinity of the **Potrero Substation** (immediately west of the Potrero Power Plant which is approximately 0.5 miles north of the proposed SFERP site): the Cesar Chavez, Mirant, Illinois, Pier 70, and the Western Pacific Alternatives. Staff evaluates the Mirant Site (see Potrero Power Plant Unit 7 Alternative) in Appendix A. The other four sites were eliminated from detailed evaluation, primarily because they are not substantially different from the proposed site and offer no substantial environmental benefits. The specific reasons for elimination of each of these four sites are presented in Appendix B, Alternatives Eliminated.

Sites Not Near 115 kV Substations

In addition to the sites near the Potrero Substation, four other sites were considered and discarded during the planning and screening phase of the AFC. One of these sites was a multiple unit site: at the San Francisco International Airport (SFIA), east of the United Cogeneration facility. The City eliminated this site from further consideration because of indications from the CA ISO that it would not meet the CCSF's goal of shutting down existing in-City generation, in particular, the Hunters Point Power Plant. However, staff retains this alternative for full analysis (see Appendix A).

Two other sites considered by CCSF were potential single-turbine sites located at the NRG Thermal plant near Fifth and Jessie Streets or at the SEWPCP. Neither of these sites is evaluated fully in this Staff Assessment; the rationale for their elimination is discussed in Appendix B, Alternatives Eliminated.

The third potential single-turbine site was located on Caltrans property near the Bay Bridge. Caltrans currently intends to use the site as a lay-down area for freeway off-ramp seismic improvements. The closest substation is the Embarcadero 230 kV Substation at 1st and Folsom Streets. To meet the siting criteria, a plant located at this site would have to interconnect to the Mission Substation. CCSF states that both electric and gas interconnection costs would be very expensive, construction costs would be expensive due to lack of a construction staging area, and that noise abatement and visual treatments would likely require either a high sound wall or enclosure. Therefore, this site was eliminated early in the screening process.

The AFC also discussed the feasibility of using Mirant's other Bay Area power plants (the existing Pittsburg and Contra Costa Power Plants). The AFC considered the No Project Alternative, transmission system alternatives, transmission interconnection alternatives, alternative generation technologies and configurations, alternative fuels, and alternative cooling system/water supplies. The AFC also presented a summary of the alternative sites evaluated in the SFEC proceeding.

Alternative Technologies

In addition to site alternatives, several potential NO_x control technologies for combustion gas turbines were evaluated in the AFC (Section 9.6.1). The SCONO_x combustion modification technology is not evaluated in this section but is considered in the Hazardous Materials Management section of this FSA.

The applicant also considered alternatives to Ammonia-based Emission Control Systems. These technologies are also evaluated in the Staff Assessment section on Hazardous Materials Management.

ALTERNATIVE SITES IDENTIFIED BY THE PUBLIC

On June 15, 2004, the Energy Commission held the Informational Hearing and Site Visit that begins its project review process. Several members of the public spoke during the public comment period in support of consideration of alternative sites, but no specific sites were suggested in that forum. In addition, Energy Commission staff met with various community members and groups to hear their concerns and solicit recommendations for alternative sites. Sites at the SFIA, Treasure Island, and the

Presidio were suggested as potential alternatives. The SFIA site is fully considered herein (see Appendix A), but the Treasure Island and Presidio sites are not evaluated in detail, as explained more fully in Appendix B, Alternatives Eliminated.

ALTERNATIVE SITES/PROJECTS IDENTIFIED BY STAFF

Based on CEQA requirements, staff's alternatives analysis was based on consideration of the following criteria:

1. An alternative should avoid or substantially lessen one or more of the potential significant effects of the project.
2. An ideal alternative location would be on the San Francisco Peninsula north of PG&E's Martin Substation.
3. A site should be at least 4 acres for the siting of three turbines (the shape of the site also affects its suitability).
4. The site should be within a reasonable distance of the electric transmission system, natural gas supply, and water supply.
5. The site should be available.
6. The site should not be located adjacent to moderate or high density residential areas, sensitive receptors (such as schools and hospitals), or recreation areas.

The second criterion above, that alternatives be located north of Martin Substation, resulted from a recent CA ISO analysis indicating that the entire Hunters Point Power Plant could be retired (a project objective) if at least three of the four combustion turbines available to San Francisco were located north of the Martin Substation. However, in order to provide the public and decisionmakers with analysis of a wide range of alternatives, staff has considered a broader geographic area for alternative sites, including one site south of Martin Substation (at SFIA) on the peninsula and one site in the East Bay.

From a long list of alternatives from current and previous projects (see **ALTERNATIVES Table 1**) and from field reconnaissance, staff identified five alternatives to be carried forward for detailed analysis:

- The Brisbane Alternative is on a vacant parcel in the City of Brisbane across the street from Martin Substation.
- The SFIA Alternative is at the north end of the SFIA on airport land adjacent to the United Airlines maintenance facility and cogeneration plant.
- The East Bay Alternative in Alameda County near the City of Hayward (near the site of the approved Russell City Energy Center, 01-AFC-7).
- The 530 MW Potrero Unit 7 Power Plant Project, a combined cycle project, as proposed by Mirant and as analyzed in the Final Staff Assessment published by the Energy Commission on February 13, 2002.
- The Trans Bay Cable Project, a transmission line between Pittsburg, in Contra Costa County, and the Potrero Substation.

Also, as required under CEQA, the No Project Alternative is also considered. Appendix A presents each of the six selected alternatives described in detail, including environmental and engineering analysis in all disciplines. Appendix B presents a discussion of the alternatives that were eliminated from detailed analysis.

RESPONSE TO AGENCY AND PUBLIC COMMENTS

One comment letter was received from Samuel Wehn, Trans Bay Cable, LLC, dated October 14, 2005, which discussed the Alternatives section. In response to the letter, text in the section discussing “Biological Resources – Aquatic” under the Trans Bay Cable Project Alternative has been revised to clarify that dredging periods would be established by the National Marine Fisheries Service (NMFS) and dredging permits from the NMFS and U.S. Army Corps of Engineers would be required, which would include safeguards and mitigation for aquatic biota. No other text changes were made in response to agency and public comments.

SUMMARY OF IMPACTS OF ALTERNATIVES

ALTERNATIVES Table 2 presents a summary of the comparative impacts of the five alternative sites and projects with the proposed project. This table states whether the impacts of each site in each issue area result in that site being preferred to the proposed site or not. The Potrero Power Plant Unit 7 alternative has the potential for greatest impacts of all the alternatives. Of the four alternative sites evaluated, the Brisbane Alternative has the potential for greatest impacts and would have greater impacts in comparison with the proposed SFERP in the issue areas of noise, land use, traffic, visual resources, and water and soils, as well as issues relating to transmission system engineering and transmission safety and nuisance.

In addition, the Trans Bay Cable Project and the Brisbane, SFIA, and East Bay Alternatives would fail to meet a major project objective of closing down aging in-City generation (e.g., releasing Potrero Units 3 through 6 from applicable RMR contracts) because they would not be located within the CCSF, and would not meet CA ISO requirements for generation to be “north of Martin Substation.” The Trans Bay Cable Project would likely have the least environmental impacts overall (primarily because, as a transmission project, its operational impacts would be minor) but construction of this project would result in greater impacts to aquatic biological resources, water and soil, traffic, geological resources, and transmission line safety and nuisance impacts.

Staff also believes that, overall, the No Project Alternative is not superior to the proposed project. The No Project scenario (described in Appendix A) would likely delay the closure of the Hunters Point Power Plant and Potrero Power Plant Units 3 through 6, which are objectives of the proposed SFERP and are older plants, which have relatively higher air emissions. The No Project Alternative would also result in reduced reliability for San Francisco’s electrical supply.

ALTERNATIVES Table 2
Comparison of Impacts of Alternative Sites to the Proposed SFERP

Issue Area		Brisbane Alternative	SFIA Alternative	East Bay Alternative	Potrero Unit 7	Trans Bay Cable
Environmental Assessment						
Air Quality		Similar	Similar [for 3 turbines]	Similar	Less preferred	Preferred
Biological Resources	Terrestrial	Similar	Less preferred	Less preferred	Similar	Less preferred
	Aquatic	Similar	Less preferred	Less preferred	Less preferred (w/ once-through cooling) Similar (w/hybrid)	Less preferred
Cultural Resources		Similar	Slightly Preferred	Slightly Preferred	Similar	Less Preferred
Hazardous Materials Management		Similar	Similar	Similar	Less preferred	Preferred
Land Use		Less preferred	Similar	Similar	Less preferred	Preferred
Noise		Less preferred	Less preferred	Similar	Less preferred	Preferred
Public Health		Similar	Similar [for 3 turbines]	Similar	Less preferred	Similar
Socioeconomics		Similar	Similar	Similar	Similar	Preferred
Traffic and Transportation		Less preferred	Preferred	Similar	Less preferred	Less preferred
Transmission Line Safety and Nuisance		Less preferred	Depends on transmission line routing	Less preferred	Less preferred	Less preferred
Visual Resources		Less preferred	Similar	Similar	Less preferred	Similar
Waste Management		Similar	Similar	Similar	Less preferred	Slightly preferred
Water and Soils		Less preferred	Preferred	Similar	Less preferred	Less preferred

Issue Area	Brisbane Alternative	SFIA Alternative	East Bay Alternative	Potrero Unit 7	Trans Bay Cable
Worker Safety and Fire Protection	Similar	Similar	Similar	Similar	Preferred
Engineering Assessment					
Facility Design	Similar	Similar	Similar	Similar	Similar
Geology and Paleontology	Similar	Similar	Similar	Similar	Less preferred
Power Plant Efficiency	Similar	Similar	Similar	Preferred	No impact
Power Plant Reliability	Similar	Similar	Similar	Slightly less preferred	No impact
Transmission System Engineering	Less preferred	Less preferred	Less preferred	Preferred	Less Preferred

APPENDIX A: ALTERNATIVES EVALUATED IN DETAIL

Six alternatives are evaluated in this section, including three alternative sites for the three turbines proposed by CCSF, two alternatives to the SFERP project as a whole, and the No Project Alternative as required by CEQA. The alternatives are:

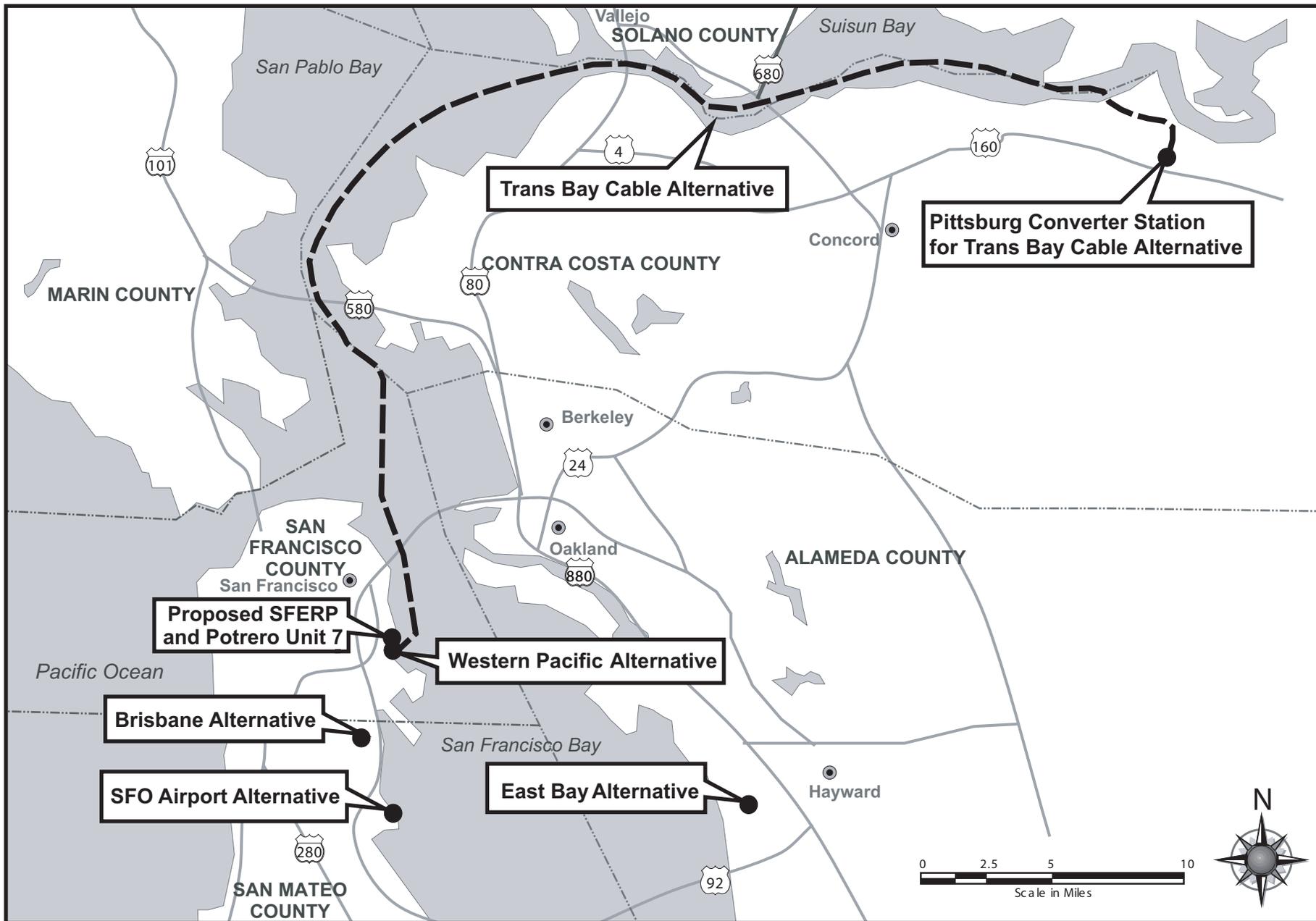
- Site Alternatives:
 - Brisbane Alternative
 - SFIA Alternative
 - East Bay Alternative
- Project Alternatives:
 - Potrero Unit 7 Power Plant
 - Trans Bay Cable
- No Project Alternative

Each alternative is described below, followed by analysis of the environmental impacts and engineering constraints of that alternative. **ALTERNATIVES Figure 1** shows the location of all of the alternatives that were evaluated. **ALTERNATIVES Table 2** on the previous page is a comparison table that summarizes the impacts of each alternative in each issue area.

ALTERNATIVES - FIGURE 1

San Francisco Electric Reliability Project Supplement A - Overview of Alternatives Evaluated

FEBRUARY 2006



ALTERNATIVES

BRISBANE ALTERNATIVE

Site Description

This site is owned by Sunquest Properties and is located within a large (approximately 180 acres) area of level, vacant land that was used by Southern Pacific Transportation Company for major railcar rehabilitation and locomotive maintenance operations from about 1914 to 1960. The site was purchased by the Taiwan-based firm Sunquest (formerly called Tuntex) Properties in 1990.

The site is located in Visitacion Valley, a basin tributary to the San Francisco Bay and an area of the City of Brisbane known as the Baylands Planning Area. The Bay is located about 2,000 feet east of the site, immediately east of Highway 101. The alternative site would be located northeast of the intersection of Bayshore Boulevard and Geneva Avenue. PG&E's Martin Substation is located on the southwest corner of the intersection. A Union Pacific railroad siding runs just east of and parallel to Bayshore Boulevard in the area of Geneva Avenue, and the proposed site location would be immediately east of the retired siding.

The entire area between Bayshore Boulevard and Highway 101 is vacant and undeveloped so adequate space is available. In this regard, the site would be adequate for either three or four gas turbines (though only the proposed three-turbine option is considered here). The switchyard would be oriented in the westerly direction facing Martin Substation.

The portion of the site located north and east of Geneva Avenue has undergone remediation for heavy metals contamination. A groundwater pump-and-treat system for this area was installed in October 1994. The site portion south of Geneva Avenue is still contaminated with hydrocarbons and is under control of the RWQCB (DTSC 2004).

The Brisbane General Plan calls for this site to be used for "Trade Commercial Planned Development" (TC/PD: for hotels, research, and development, etc.). This site is zoned C-1, which allows mixed-use and commercial development and the owner is working with the City of Brisbane to develop the property into large corporate-style, light-industrial uses. However, no development plans have been formally submitted for the property (Taylor 2004). The site's current zoning reflects a zone change to convert the site's historic M-1 industrial designation. Currently, general development guidelines do not support the location of heavy industrial uses on this site. Therefore, a General Plan amendment and a zoning change would be required to accommodate the siting of power generating facilities at this site (CEC 2002a).

To the west of the site are commercial and service commercial uses along Bayshore Boulevard and Geneva Avenue. Also, the Cow Palace, a regional exhibition facility, is located 0.6 miles west of Bayshore Boulevard on the south side of Geneva Avenue. The land use character of the immediate alternative site area is predominantly industrial, due to the existing electric transmission infrastructure (i.e., Martin Substation) west of the site and the adjacent and nearby light-industrial and heavy industrial uses. However, numerous single-family residences and two elementary schools are located in Daly City to the west in the vicinity of this site. The closest residences are at Talbert Street and

MacDonald Avenue, one block west of Bayshore Boulevard (approximately 2,000 feet), and the closest school is approximately 0.4 miles to the west.

Infrastructure Availability

The City of Brisbane purchases its water from CCSF's Southeast Water Pollution Control Plant (SEWPCP) (located approximately 3 miles north of this site). The sewer main to this facility, which is operated by the Bayshore Sanitary District, runs north from the Carlyle Pump Station at Industrial Avenue along Bayshore Boulevard adjacent to the Brisbane Alternative Site. Therefore, water for this alternative site could be obtained by tapping into the 14-inch force main in Bayshore Boulevard and there is adequate space available to include a treatment facility onsite, as would be installed for the proposed project. Discharge of wastewater would require permits from both the Bayshore Sanitary District and the SFPUC.

A 13.8 to 115 kilovolt (kV) step-up transformer for each unit and 115 kV on-site switchyard would be required. A new 115 kV overhead or underground transmission line would run from the plant switchyard across Bayshore Boulevard to PG&E's Martin Substation, a distance of approximately 600 feet. This line would interconnect to Martin Substation at 115 kV at a location within the substation to be designated by PG&E.

Fuel gas would be supplied from a PG&E gas pipeline in Bayshore Boulevard. Less than 600 feet of new gas pipeline would be required to connect the plant site to the PG&E line (CEC 2002a). Gas compression will be required at the site to provide correct operating pressure for the gas turbines.

ALTERNATIVES Figure 2 shows the likely location and layout of the generating facility within the Brisbane Alternative site.

Environmental Assessment for Brisbane Alternative

Air Quality

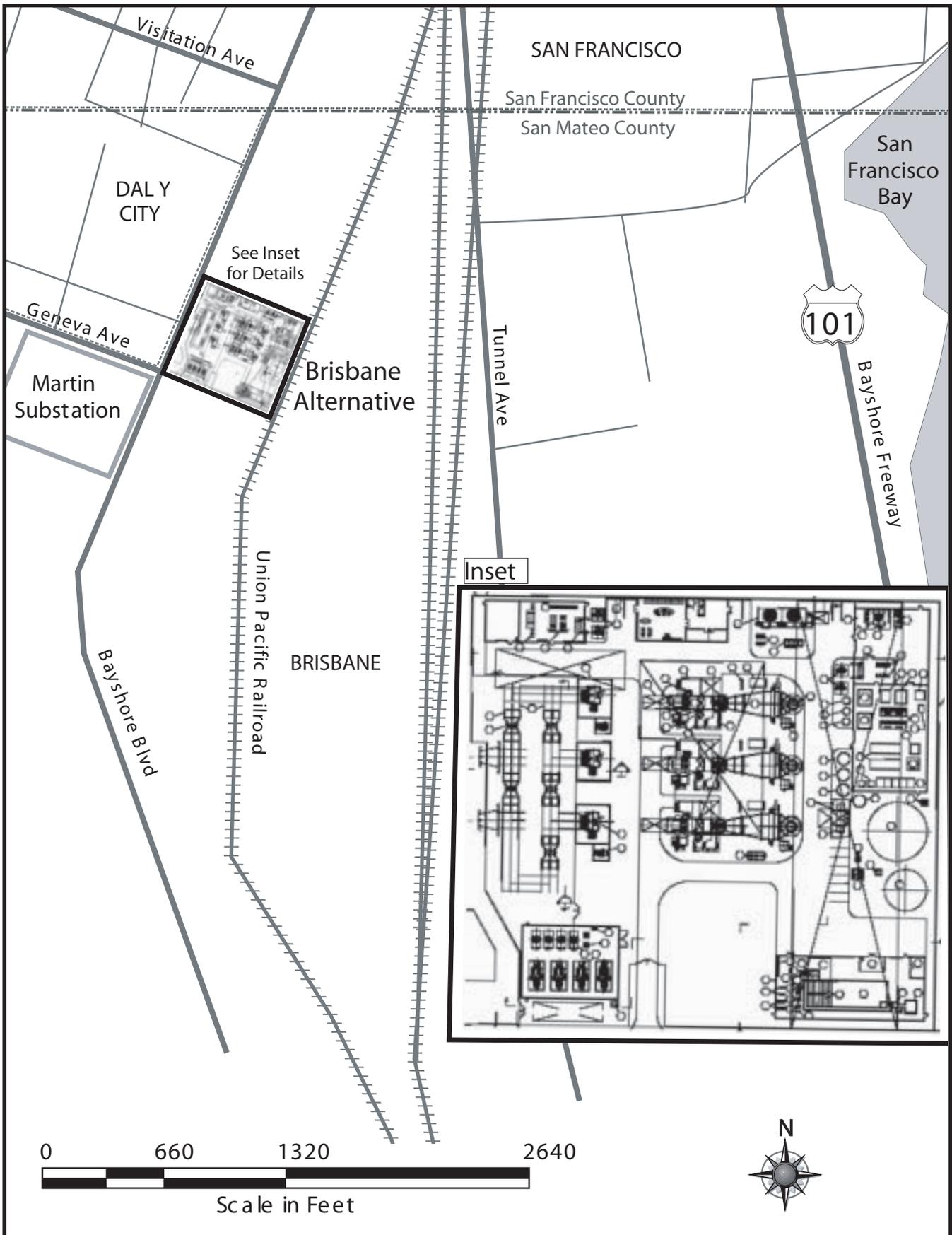
Emissions from the Brisbane Alternative would need to be controlled to satisfy the air permitting requirements of the Bay Area Air Quality Management District (BAAQMD). As such, construction and operation of SFERP at the Brisbane site would be subject to permit requirements and it would require Energy Commission mitigation, similar to that of the proposed project, to avoid significant air quality impacts. Appropriate mitigation at the Brisbane site would likely involve similar, locally-oriented recommendations to reduce PM10 impacts. As a result, mitigated power plant emissions would be the same as those of the proposed SFERP.

Biological Resources

The Brisbane site is a vacant, sparsely vegetated and disturbed lot with historic industrial use, in a developed area. The soil surface has been disturbed and compacted, and there is no surface water present. Field reconnaissance for biological resources previously conducted by staff identified no occurrences of threatened or endangered species on or adjacent to the site (CEC 2002a). Vegetation is sparse and cover is limited to herbaceous plants. No native trees, riparian or other sensitive habitats or vegetation are on or near the site. This site is approximately 0.5 miles west

ALTERNATIVES - FIGURE 2

San Francisco Electric Reliability Project Supplement A - Brisbane Alternative Site Location and Layout



CALIFORNIA ENERGY COMMISSION, SYSTEMS ASSESSMENT & FACILITIES SITING DIVISION, FEBRUARY 2006

SOURCE: Aspen Environmental Group

of the Bay shoreline, which in this area includes intertidal mudflats. Because of the developed surroundings, there appears to be little or no opportunity for wildlife movement among patches of better habitat. As with the proposed project, storm water runoff management would be appropriate to avoid impacts to surface waters. If the project were located at this alternative site, it would have similar NOx emission concerns for effects on biological resources as the proposed project site.

Cultural Resources

Records searches and detailed site surveys for cultural resources have not been completed for the Brisbane site, but during a pedestrian field survey, no historic structures were apparent on the area proposed for use for this alternative. Adjacent buildings and structures were not evaluated to determine if they met the eligibility requirements for the California Register of Historical Resources (CRHR). Previous assessment of the Brisbane site by staff indicates that there is a potential for encountering prehistoric sites, because the site is located on or near the original shoreline (CEC 2002a). Two prehistoric sites were previously identified along the original shoreline within one-half mile of the Brisbane site. One of these (P-41-000496) is located within 1,000 feet and contains human remains. Additionally, the foundations of a historic period dairy barn (CA-SMA-326H) are located within 0.5 mile of the property (CEC 2002a). These known sites could be avoided with proper mitigation and oversight. Buried cultural resources may also be present in the vicinity of linear facilities. Compared to the SFERP site, developing the SFERP at the Brisbane site would have a similar impact on historical resources.

To avoid impacts potentially caused by disturbing buried cultural and historic resources at the Brisbane site, oversight of a cultural resources specialist would likely be necessary during construction; however these potential impacts would be similar to those associated with the proposed project site.

Hazardous Materials Management

Hazardous materials use at the Brisbane site, including the quantities handled during transportation and disposal, would be identical to the proposed project. Transportation of hazardous materials to the Brisbane site would occur approximately two to three blocks from residences, which are located to the west across Bayshore Boulevard. The transportation route from Highway 101 would be through industrial, commercial, or open space areas. Compared to the proposed project, selecting the Brisbane site would result in similar impacts from transportation of hazardous materials, due to the similar proximity to homes to the site and to the transportation route. No special measures related to hazardous materials management would be required for this alternative site, and impacts during operation would be similar.

Land Use

The Brisbane site is located within an area of the City of Brisbane known as the Baylands Planning Area. The site is on a level, vacant parcel that previously served as a rail freight yard. A portion of the site north of Geneva Boulevard has undergone remediation for heavy metals, and hydrocarbon contamination may be present on lands located immediately to the south (DTSC 2004). Northwest of the site are non-operating commercial and industrial facilities, and east of site are industrial facilities including

resource recovery (recycling) operations. West of the site are commercial and service uses along Bayshore Boulevard and Geneva Avenue. The land use character of the area can be described as predominantly industrial due to the existing electric transmission infrastructure (i.e., Martin Substation). However, numerous single-family residences and two elementary schools are located in Daly City to the west in the vicinity of this site. The closest residences are at Talbert Street and MacDonald Avenue, one block west of Bayshore Boulevard (approximately 2,000 feet), and the closest school is approximately 0.4 miles to the west.

Staff previously assessed the designation of the Brisbane site and found that it is zoned C-1, which allows mixed-use and commercial development. This designation is more restrictive than an industrial designation. The Brisbane General Plan designates the area as Trade Commercial Planned Development (PD/TC), and the general development guidelines do not support the location of heavy industrial uses in this area (CEC 2002a). Therefore, a General Plan amendment and a zone change would be required to accommodate the SFERP at this site. This represents an inconsistency with applicable plans and policies. As such, when compared to the proposed project, this alternative site would be more likely to create a significant land use impact because of the potential conflict with the policies of the City of Brisbane.

Noise

The residences nearest to the Brisbane site are approximately 2,000 feet to the west, across Bayshore Boulevard. This alternative site lies within the City of Brisbane and would be subject to the Noise Element of the City of Brisbane General Plan and Chapter 8.28 of the City of Brisbane Municipal Code. Compliance with the Brisbane Noise Element would likely be achieved with economical mitigation features. However, introduction of SFERP at this site would introduce noise levels that could be incompatible with future use of the area under its zoning designation for mixed-use and commercial development. The feasibility of future development of adjacent properties for mixed uses would be adversely affected. Because of this potential land use incompatibility, this alternative would cause greater operational noise impacts than the proposed project. Construction noise would cause impacts similar to those expected at the SFERP site.

Public Health

The air pollutants emitted by the SFERP at the Brisbane site would be identical to those that would occur at the proposed project site. As such, the project's emissions of toxic air contaminants would not be likely to expose the surrounding population to any significant risk of cancer or non-cancer health effects.

Socioeconomics

Staff estimated the benefits from the SFERP project should it be built at the Brisbane site. Benefits include increases in sales taxes, employment, and income for San Mateo County and neighboring counties (see **SOCIOECONOMICS Table 2** for data and information). Staff finds that the SFERP 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 Brisbane Alternative is about 35 percent, and

within one mile it is about 22 percent; however, there are individual census blocks with greater than 50 or 75 percent minority population. The low-income population within six miles is slightly more than 6 percent and within one mile is slightly less than 5 percent. In comparison, based on staff's demographic screening analysis for the proposed SFERP project, the minority population within six miles of the proposed power plant site at Potrero is less than 57 percent and the low-income population within six miles is slightly above 11 percent.

Staff finds that there would be no 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 and, therefore, there are no socioeconomic environmental justice issues. The Brisbane Alternative would be consistent with the applicable socioeconomic LORS.

Traffic and Transportation

The Brisbane site can be accessed from Bayshore Boulevard west of the site or Tunnel Avenue east of the site. Although the site is located in an industrial area, Bayshore Boulevard and Tunnel Avenue are primarily used for through traffic to residential and local commercial uses. There is no port facility or rail service to this site (CEC 2002a). Similar to the proposed project, before construction could occur at the Brisbane site, a construction traffic control and transportation demand implementation program would need to be developed in coordination with the City of Brisbane, San Mateo County, and Caltrans. These programs would limit construction-period truck and commute traffic to off-peak periods and avoid potential traffic and transportation impacts. Because of the high level of through-traffic on the access roadways, this site would cause greater impacts to traffic and transportation than the proposed project.

Transmission Line Safety and Nuisance

Power generated at the Brisbane site would travel from the on-site switchyard to the adjacent Martin Substation via a short overhead or underground transmission line across Bayshore Boulevard. Similar to the proposed project, this alternative would not be likely to cause transmission line safety hazards or nuisances. However, the length of the proposed project line would be approximately 300 feet compared to the 600 feet to be used for the Brisbane alternative, showing the proposed project line as preferable in terms of the total length of the source of line fields to which individuals might be exposed.

Visual Resources

Observation points for the Brisbane site include the ridges of Visitacion Valley, south, west, and north of the site. Residential areas north and west of the site (within about 0.5 miles) and on San Bruno Mountain to the southwest, and McLaren Park (about 0.7 miles to the northwest) provide numerous opportunities for foreground and middle-ground viewing of the site. There are few structures of notable height surrounding the site. Based on previous staff assessment for this site (CEC 2002a), staff found that the power plant would introduce a high level of contrast because of the general absence of surrounding tall structures and that the power plant would introduce a co-dominant to dominant feature, especially when viewed from the higher residential areas and

surrounding hills, including McLaren Park. Staff also found that view blockage of wetland and Bay landscapes would be moderate. These effects would cause significant visual impacts that would be more severe at this site than they would be at the proposed project site.

Waste Management

Construction at the Brisbane site would require excavation of fill material that underlies the site. There is a history of contamination from heavy metals and hydrocarbons at this site and at adjacent properties (DTSC, 2004).

The project will produce minimal maintenance and plant wastes typical of power generation operations. An outside contractor will remove all generated wastes to the contractor's establishment for ultimate disposal. Generation plant wastes include: oily rags, broken and rusted metal and machine parts, defective or broken electrical materials, empty containers, and other miscellaneous solid wastes, including the typical refuse generated by workers. As with the proposed project, all construction and operation activities would need to be conducted in compliance with regulations pertaining to the appropriate management of wastes. Similar to the proposed project, the project would need to implement a comprehensive program to manage hazardous wastes and obtain a hazardous waste generator identification number (required by law for any generator of hazardous wastes). The environmental impact of waste disposal would be similar to the proposed project.

Water and Soils

The Brisbane Alternative and surrounding properties have a history of groundwater and soil contamination from heavy metals and hydrocarbons. Site remediation is ongoing in the vicinity, and contamination is known to remain on adjacent properties. The extent of the remaining contamination is unknown. Mitigation measures would need to be developed to ensure proper testing, treatment, and disposal during construction and site preparation. This would likely involve participation of the San Francisco Bay Regional Water Quality Control Board and the County of San Mateo Health Department.

Plans for grading and erosion control, dewatering, and storm water pollution prevention would also need to be reviewed by local agencies, including the San Francisco Bay Regional Water Quality Control Board, the City of Brisbane Public Works Department. Additionally, this site is in the vicinity of a nearby landfill, which means the County of San Mateo might have provisions related to earthmoving. The plans, procedures, and measures needed to address potentially adverse site conditions would generally be similar to those necessary for the proposed project.

Water for process and domestic uses would likely be obtained from the City of Brisbane or via direct connection to SFPUC facilities. Wastewater would be handled in a similar manner as the proposed project by being treated and discharged to the local sewer or to the SEWPCP.

Worker Safety and Fire Protection

The Brisbane site would be located within an area that is designated for mixed uses. The area is currently served by the San Mateo County, North County Fire Authority. The

fire risks of this alternative would be similar to those of the surrounding existing uses, including the Martin Substation, and thus would pose no new or different demands on local services.

Similar to the proposed project, it would be appropriate for a power plant at this site to provide a Project Demolition and Construction Injury and Illness Prevention Program and a Project Operations Safety and Health Program in order to ensure adequate levels of industrial safety. Also similar to the proposed project, the local fire department would be contacted to assure that the level of staffing, equipment, and response time for fire services and EMS are adequate.

Engineering Assessment for Brisbane Alternative

Facility Design

The project's facility design at the Brisbane site would be similar to that of the SFERP at the proposed project site. As with the proposed project, staff-recommended measures may be appropriate to ensure compliance with engineering laws, ordinances, regulations and standards applicable to the design and construction of the project.

Geology and Paleontology

The Brisbane site overlies land created when the tidal flats and marshes along the margin of San Francisco Bay were reclaimed by the placement of fill. The fill probably consists of debris and construction rubble and is believed to be underlain by variable thickness of young Bay mud and Bay-Side Sand. Strong seismic ground shaking (peak ground acceleration of 0.6 to 0.7g) may occur at the site in the next 50 years, although no active faults are known to cross the site. Pile foundations would likely be required throughout this site. Adequate design parameters for the facility would need to be determined through a site specific evaluation by a Certified Engineering Geologist or Geotechnical Engineer.

Impacts due to seismic hazards and soil conditions would need to be mitigated by complying with the requirements and design standards of the California Building Code. Based on previous staff assessment for this site (CEC 2002a), impacts to geologic and paleontological resources would not be expected. Mitigation of potential impacts to paleontological resources could be accomplished with construction monitoring by a resource specialist and salvaging of any identified fossils. These impacts and the measures for mitigation would be similar to those of the proposed project.

Power Plant Efficiency

The plant configuration and combustion turbine generator technology that would be employed at the Brisbane site would be similar to the proposed project, which means it would result in similar consumption of fuel, and it would result in a similar level of efficiency.

Power Plant Reliability

The plant configuration at the Brisbane site would be similar to the proposed project, which means it would result in similar levels of equipment availability. Plant

maintainability, fuel and water availability, and reliability of the plant in relation to natural hazards would each be similar to the proposed project.

Transmission System Engineering

The Brisbane site would not be located within the CCSF, and would not meet CA ISO requirements for generation to be “north of Martin Substation”. Locating SFERP in San Mateo County would require reevaluating the capacity of the Martin Substation and its transmission links to PG&E substations north of Martin within the CCSF. Compared to the proposed project, this alternative would likely cause adverse effects to the transmission system because constraints on the links to PG&E substations north of Martin would be exacerbated. Moreover, it would not accomplish the project goal of providing sufficient new in-City generation that would allow for closure of older Hunter’s Point and Potrero facilities.

SAN FRANCISCO INTERNATIONAL AIRPORT (SFIA) ALTERNATIVE

Background

This site was the subject of two Energy Commission proceedings in 2001:

- A 51 MW peaker power plant proposed by El Paso Energy Company (United Golden Gate Power Plant, Phase I) was approved for this site by the Energy Commission in March 2001. This project was never constructed due to unresolved land lease contract issues and its approval has expired (CEC 2004 - Energy Commission Energy Facilities Status).
- El Paso Energy Company submitted an AFC (01-AFC-3) to the Energy Commission in March 2001 to construct United Golden Gate Power Plant, Phase II, a proposed 570 MW power plant, adjacent to the existing United Cogeneration Inc. facility. This combined cycle plant would have replaced the simple-cycle Phase I power plant. However, the application is currently on hold because the applicant has not obtained site control (CEC 2004 - Energy Commission Energy Facilities Status).

While these two projects have encountered difficulties with site control, the site is on the San Francisco International Airport (SFIA) property, and therefore, is within the jurisdiction of the CCSF. CCSF is currently planning to use SFIA property to site one of the four combustion turbines that it would receive from the Williams Settlement (CCSF 2004). This project, known as the San Francisco International Airport Combustion Turbine Project (SFIActP), is proposing to use a 2-acre lot that currently houses bulk materials and temporary construction trailers and is located near the San Francisco Bay on a projection of filled land known as North Field, approximately 0.6 miles east of the SFIA Alternative site.

There would not be enough space for all four turbines at the proposed SFIActP site, which is situated on the corner of North Access Road and Clearwater Drive, south of the SFIA Wastewater Treatment Plant. However, given the proximity of the two sites, both of which are located on SFIA property, if the SFIA Alternative site were used then all four turbines would most likely be sited at the SFIA Alternative site together. Therefore, the analysis of this alternative considers that all four turbines would be installed at this alternative site.

Site Description

The SFIA Alternative is located near the San Francisco Bay, approximately 9.3 miles south-southeast of the CCSF. The alternative site is located south of the intersection of North Access Road and Coast Guard Road on SFIA property. The site is immediately east of the United Airlines Maintenance and Operations Center (UMOC) and the United Cogeneration Inc. (UCI) cogeneration power plant. The site is level and paved and is currently used as a parking lot by UMOC employees. There would be adequate space on the 11-acre site for a four turbine installation, retaining a portion of the existing parking lot for its current use.

Airport facilities are located on the east, south, and west sides of the site. North of the site across North Access Road are additional airport facilities, shoreline wetlands, the Safe Harbor Homeless Shelter (located approximately 500 feet from the site), and the County of San Mateo Transit Bus Yard. Immediately west of the homeless shelter and adjacent to the shoreline wetlands is a picnic area and a walking trail. On the west side of the shoreline wetlands are several large jet fuel storage tanks, and silos containing the City of South San Francisco's sewage discharges (CEC 2002a). Generally, the land use character of this area is predominantly industrial due to the adjacent maintenance, fueling, and cogeneration facilities. Aside from the shelter, the next nearest residences are approximately 10 blocks to the north and west, west of Highway 101 (approximately 1 mile from the site).

The site is zoned Planned Industrial (P-I) by the City of South San Francisco. This zoning allows for the development of a steam power plant. The SFIA itself has no zoning designations (UGGPC 2001)

Infrastructure Availability

This alternative site is approximately 1 mile from the newly expanded SFIA Wastewater Treatment Plant on Clearwater Drive (off of North Access Road), which has a total wastewater treatment capacity of 3.22 million gallons per day. Secondary treated effluent may be obtained for plant process uses. This would substantially reduce the space and capital cost required for onsite water treatment facilities. Minimal filtering would be required for basic process water such as cooling tower makeup. Water for injection into the turbine (NOx and Sprint systems) must be de-ionized, so this treatment step would still be required.

Natural gas fuel could be supplied by a connection to PG&E's gas Line 101 near the intersection of South Airport Boulevard and North Access Road. Approximately 2,100 feet of new pipeline would be required to connect Line 101 to the project site. The new pipeline would parallel North Access Road in an existing ROW to the site. Gas compression will be required to provide adequate operating pressure for the combustion turbine. The natural gas interconnection could also be approximately 1 mile from the site at South Airport Boulevard and San Bruno Avenue (SFERP 2004q).

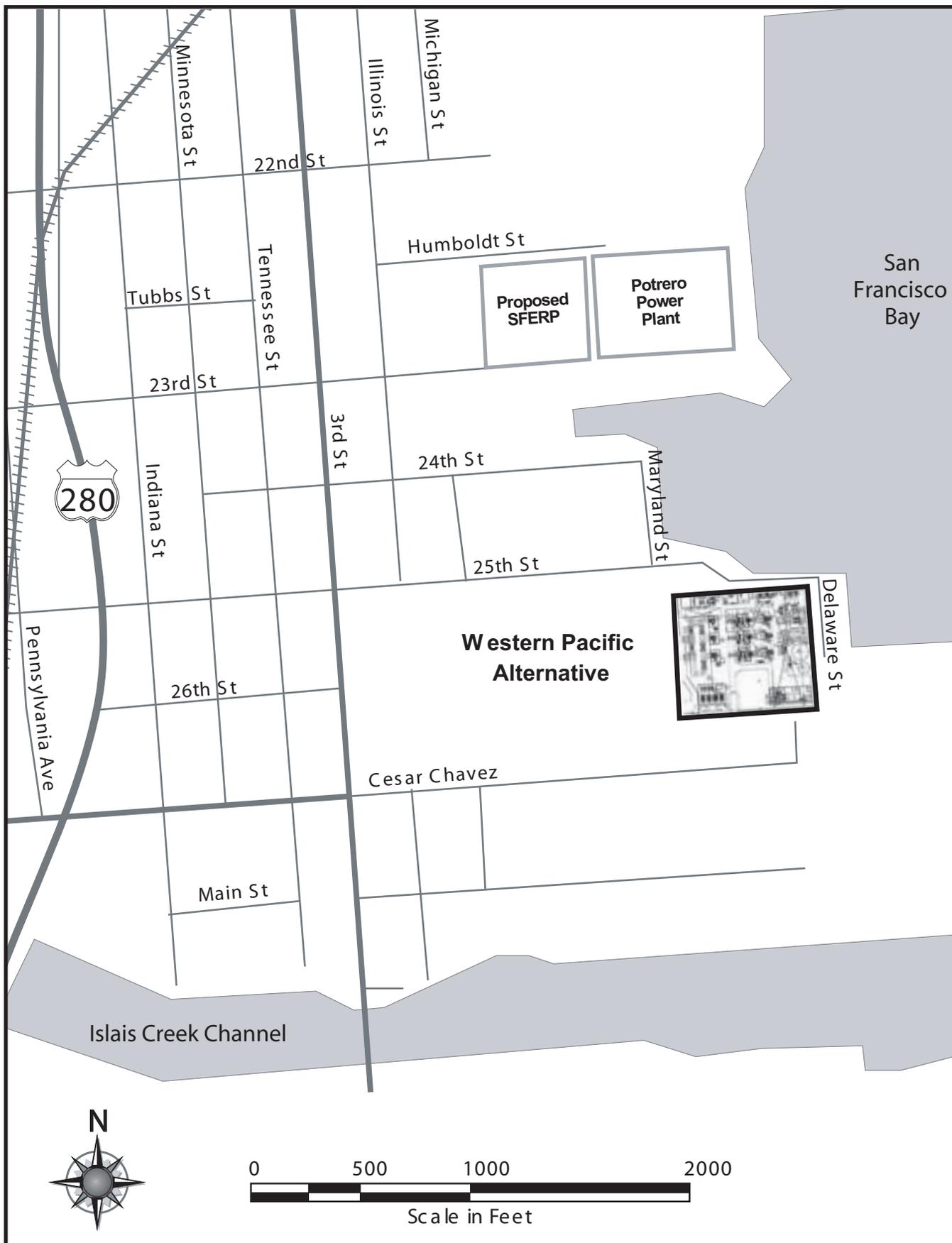
For this site, the electrical interconnection could either be at the East Grand substation, approximately 1.5 miles from the plant on Grand and Gateway in the City of South San Francisco (SFERP 2004q) or via the existing UCI cogeneration facility has a single-circuit 115 kV overhead transmission line that serves the UCI facility and connects with

the San Mateo-Martin Circuit No. 5. Each turbine-generator for the alternative would have a dedicated unit transformer feeding a new 115 kV switchyard at the alternative site. To tie into the existing single-circuit 115 kV line for the UCI facility, the switchyard would likely connect to the San Francisco Airport Substation (BA) at 115 kV via two circuits in duct banks and conduits about 6,700 feet long.

ALTERNATIVES Figure 3 shows the location of the SFIA Alternative, and **ALTERNATIVES Figure 4** shows the layout of the generating facility within the site.

ALTERNATIVES - FIGURE 3

San Francisco Electric Reliability Project Supplement A - Western Pacific Alternative Site Location and Layout

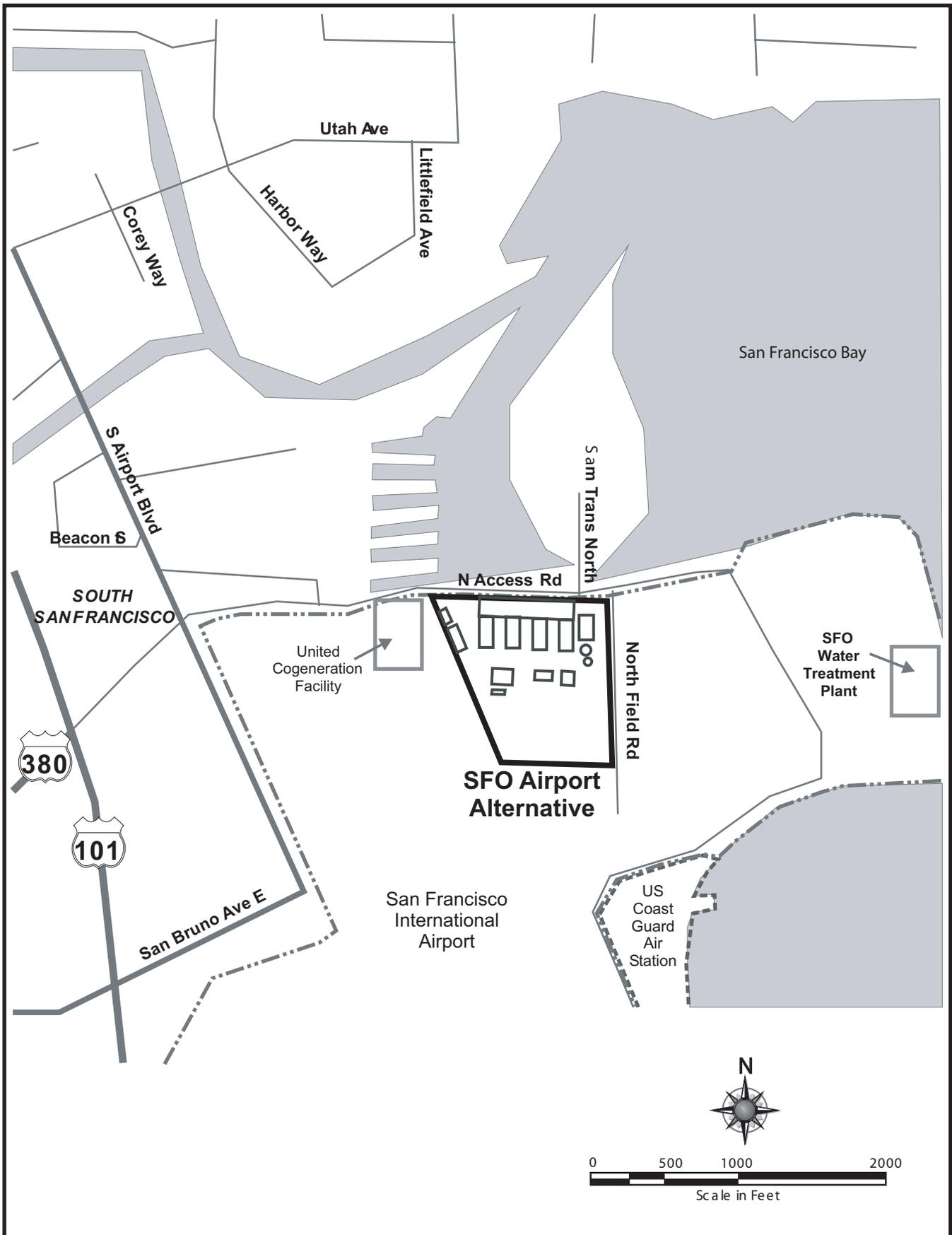


CALIFORNIA ENERGY COMMISSION, SYSTEMS ASSESSMENT & FACILITIES SITING DIVISION, FEBRUARY 2006

SOURCE: Aspen Environmental Group

ALTERNATIVES - FIGURE 4

San Francisco Electric Reliability Project Supplement A - SFO Airport Alternative Site Location



CALIFORNIA ENERGY COMMISSION, SYSTEMS ASSESSMENT & FACILITIES SITING DIVISION, FEBRUARY 2006

SOURCE: Aspen Environmental Group

Environmental Assessment for SFIA Site Alternative

Air Quality

Emissions from this alternative would need to be controlled to satisfy the air permitting requirements of the BAAQMD. Power plant emissions, therefore, would be approximately 25 percent greater with the addition of the fourth turbine but the use of three turbines would have the same emissions as the proposed project. Regardless, impacts would be similar to the proposed project, because construction and operation of the SFERP at the SFIA site would be subject to similar permit requirements and similar mitigation requirements from the Energy Commission in order to avoid significant air quality impacts. Appropriate mitigation at the SFIA Alternative would likely involve similar, locally-oriented recommendations for reducing PM10 impacts as those recommended for the SFERP.

Biological Resources

The SFIA site is a developed parking lot. The impervious surface of this site offers negligible to no habitat resources on the site. The nearest available habitat is the San Bruno Slough marsh located on the opposite side of North Access Road, approximately 75 to 100 feet north of the SFIA Alternative. Field reconnaissance for biological resources previously conducted by staff observed waterfowl, cord grass, pickleweed, and saltgrass at the marsh, and no occurrences of threatened or endangered species on or adjacent to the site (CEC 2002a). However, the California clapper rail (federal and state listed Endangered) is likely to occur in the coastal salt marsh habitat of San Bruno Slough north of the SFIA Alternative site.

Locating SFERP at this site could result in indirect off-site impacts to terrestrial biological resources at the nearby marsh from noise and air emissions. However, this site is located near the airport, adjacent to an existing cogeneration plant and a road that causes considerable continuous and intermittent noise during the day. Therefore, the additional noise from SFERP at this location would be unlikely to cause a significant increase in noise disturbance to biological resources. If the project were located at this alternative site, it would have similar NOx emission concerns as the proposed project site. Air pollutant emissions, such as dust during construction that may not be dispersed beyond the immediate vicinity of the marsh would need to be controlled. As with the proposed project, storm water runoff management would also be essential to avoid impacts to the surface water and the nearby marsh habitat. Because of the proximity of the SFIA Alternative to the San Bruno Slough, the overall impacts to biological resources would likely be greater than those that would occur at the proposed SFERP project site.

Cultural Resources

Records searches and detailed site surveys for cultural resources have not been completed for the SFIA Alternative, but during a recent pedestrian field survey, no historic structures were apparent on this parcel. Adjacent buildings and structures were not evaluated to determine if they met the eligibility requirements for the CRHR. Previous assessment of the SFIA Alternative by staff indicates that it has a low potential for prehistoric sites, and that no cultural resources have been previously recorded on

the site (CEC 2002a). The U.S. Coast Guard Air Station San Francisco, approximately 0.5 miles from the airport site, includes several buildings that have been found eligible for listing on the National Register of Historic Places (UGGPC 2001). Buried archaeological and prehistoric cultural resources may be present at the site and in the vicinity of linear facilities. Compared to the SFERP site where there would be the potential for vibration impacts on historic buildings within one block on either side of the proposed trenching required for the underground transmission line, developing SFERP at the SFIA site would fewer impacts on historical resources.

To avoid impacts potentially caused by disturbing buried and historic resources at the SFIA Alternative, mitigation requiring oversight of a cultural resources specialist would likely be necessary; however, potential impacts would be similar to those associated with the proposed project site.

Hazardous Materials Management

Hazardous materials use, including the quantities handled during transportation and disposal, would be identical to the proposed project. The nearest residence is 10 blocks away, but the Safe Harbor homeless shelter is located 500 feet to the north across the North Access Road. The transportation route would be approximately 0.5 miles from Highway 101 and Interstate 380 along the North Access Road, where no residential areas occur. Compared to operation of the proposed project at the Potrero site, impacts from transportation of hazardous materials would be reduced by this alternative because of the lack of proximity to residences. No special measures related to hazardous materials management would be required for this alternative site, and other impacts during operation would be similar.

Land Use

The SFIA Alternative is surrounded by airport facilities with shoreline wetlands, the Safe Harbor Homeless Shelter (located approximately 500 feet from the site), and the County of San Mateo Transit Bus Yard generally to the north. The Safe Harbor Shelter is a 90-bed emergency homeless shelter for individuals 18 years and older on a first-come, first-served basis. Therefore, in general the residents of the shelter are transient and would not be subjected to long-term exposure of project construction and operation. Immediately west of the homeless shelter and adjacent to the shoreline wetlands is a small picnic area and a walking trail. Generally, the land use character of this area is predominantly industrial due to the airport-related adjacent maintenance, fueling, and cogeneration facilities.

SFIA has no zoning ordinances and the City of South San Francisco has jurisdictional oversight within the northern portion of SFIA (UGGPC 2001). Therefore, SFIA would be within South San Francisco's zoning subarea. Staff previously assessed the designation of the SFIA Alternative and found that it is designated mixed industrial by the South San Francisco General Plan with a 161-foot height limit for structures according to the General Plan's Airport Related Height Limitations (CEC 2002a). Although the designation provides for industrial use, industries producing substantial amounts of hazardous waste or odor and other pollutants are not permitted under the mixed industrial designation. The proposed height of the SFERP stacks would conform

to this height limit, and, given the adjacent cogeneration facility, use of the SFIA Alternative for SFERP would likely be consistent with other applicable land use policies.

Although the site would be less than one mile from the runways of San Francisco International Airport, it would be located north of the east-west runway and thus would not be located on the extended runway centerline. Therefore, thermal and visible plumes from the facility would not likely cause land use incompatibility with aircraft operations or cause aviation safety impacts. However, the Airport Land Use Commission for the San Francisco International Airport would need to make a determination on consistency with the Airport's Comprehensive Land Use Plan. In addition, a Notice to Airmen may also be required advising pilots to avoid overflight of the power plant.

The proximity of this site to the Safe Harbor Homeless Shelter is a concern despite the transient nature of most of the residents. Although this shelter is located in a heavy industrial area and is likely affected by the existing surrounding airport-industrial uses, development of new power generating facilities at this site may exacerbate impacts on this sensitive land use. Use of this alternative site for SFERP would create more disturbances to short-term occupants of the shelter and people using the adjacent recreation area, both of which is closer to the alternative site than any permanent residences are with respect to the proposed project site (CEC 2002a). However, unlike the proposed SFERP site, there are no permanent residences within a mile of the alternative site.

Noise

The SFIA Alternative is adjacent to the UCI cogeneration plant, and the general area is impacted by noise from aircraft operations at the SFIA. The only nearby sensitive noise receptors are about 500 feet away, at the Safe Harbor Homeless Shelter. For this alternative site, there is a possibility of causing significant noise impacts to the residents of the nearby shelter. Compared to the proposed project, this alternative would cause greater operational noise impacts, and mitigating noise emissions to a level of insignificance would probably be more costly than at the proposed project site due to the proximity of the shelter. Construction noise would cause short-term impacts similar to those expected at the SFERP site.

Public Health

The air pollutants emitted by the SFERP at the SFIA Alternative would be approximately 33 percent greater with four turbines than the three that that would occur at the proposed project site. Use of three turbines would have identical emissions to the proposed project. Because the high-temperature exhaust of the combustion turbines would tend to carry the air pollutants far from the site, the Safe Harbor Homeless Shelter would not be adversely affected. As such, the project's emissions of toxic air contaminants would not be likely to expose the surrounding population to any significant risk of cancer or non-cancer health effects and impacts would be less than significant.

Socioeconomics

Staff has estimated the benefits from the SFERP project should it be built at the SFIA Alternative site. Benefits include increases in sales taxes, employment, and income for

San Francisco and neighboring counties (see **SOCIOECONOMICS Table 2** for data and information). Staff finds that the 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 SFIA Alternative is about 64 percent and within one mile the minority population is about 76 percent. The low-income population within six miles is slightly less than 6 percent and slightly more than 2 percent within one mile. In comparison, based on staff's demographic screening analysis for the proposed SFERP project, the minority population within six miles of the proposed power plant site at Potrero is less than 57 percent (52 percent within one mile) and the low-income population within six miles is slightly above 11 percent.

Staff finds that there would be no 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 and, therefore, there are no socioeconomic environmental justice issues. The SFIA Alternative would be consistent with the applicable socioeconomic LORS.

Traffic and Transportation

The SFIA Alternative is located at the north end of San Francisco International Airport, on the North Access Road. There is a large long-term parking structure just east of the site and the area has heavy truck activity. The high level of industrial and commercial activity of the surrounding uses generates a substantial level of traffic. Similar to the proposed project, before construction could occur for the SFIA Alternative, a construction traffic control and transportation demand implementation program would need to be developed in coordination with the CCSF, City of South San Francisco, San Mateo County, and Caltrans. These programs would limit construction-period truck and commute traffic to off-peak periods and avoid potential traffic and transportation impacts.

Although the SFIA site would be less than one mile from the runways, it would be located to the north side of the east-west runway and thus would not be located on the extended runway centerline. Therefore, thermal and visible plumes from the facility would not likely cause conflicts with aircraft traffic and operations or impact aviation safety. However, a Notice to Airmen may be required advising pilots to avoid overflight of the power plant.

Because of the lack of residential traffic in the area, this site would cause fewer impacts to traffic and transportation than the proposed project.

Transmission Line Safety and Nuisance

Power generated at the SFIA Alternative would travel from the on-site switchyard to the adjacent UCI cogeneration facility, where an established corridor would be used to connect to the San Mateo-Martin corridor if the existing 115 kV option is used. Otherwise the line would travel to the East Grand Substation, 1.5 miles away. Similar to the proposed project, this alternative would not be likely to cause transmission line safety hazards or nuisances. The only difference for the impacts of concern would

depend on the actual length of the lines as potential sources of human exposure to line fields.

Visual Resources

Observation points for the SFIA Alternative include the relatively distant residential neighborhoods near the base of San Bruno Mountain, in South San Francisco. These neighborhoods are slightly over one mile distant, but they are oriented toward the general direction of the SFIA Alternative. The surroundings of this site are of an industrial nature and they include maintenance and cogeneration facilities that exhibit substantial mass. Based on previous staff assessment for this site (CEC 2002a), staff found that the power plant would introduce a low-to-moderate level of contrast because of the industrial surroundings and that the power plant would introduce a co-dominant feature to the industrial landscape. These effects would cause adverse, but not significant visual impacts that would be similar to those of the proposed project.

Waste Management

Construction at the SFIA Alternative would require excavation of fill material that underlies the site. Previous staff assessment of the adjacent properties did not identify any areas of environmental concern (CEC 2002a).

As with the proposed project, all construction and operation activities would need to be conducted in compliance with regulations pertaining to the appropriate management of wastes. Similar to the proposed project, the project would need to implement a comprehensive program to manage hazardous wastes and obtain a hazardous waste generator identification number (required by law for any generator of hazardous wastes). The environmental impact of waste disposal would be similar to the proposed project.

Water and Soils

The SFIA Alternative would be located on San Francisco International Airport property and therefore subject to the San Francisco International Airport Tenant Improvement Guide. The guide provides provisions, regulations and procedures related to erosion control and discharge. Provisions for grading operations contain Articles that state a permit must be obtained prior to the commencement of work, which may be part of the General Tenant Permit request. During construction and site preparation, if contamination is encountered, mitigation measures consisting of proper testing, treatment, and disposal would be necessary. This would likely involve participation of the San Francisco Bay Regional Water Quality Control Board and the County of San Mateo Health Department. These plans, procedures, and measures would be similar to those necessary for the proposed project.

Water for process and domestic uses would likely be obtained from the SFIA Wastewater Treatment Plant California Water Company that serves the City of South San Francisco. Wastewater would be returned to the SFIA Wastewater Treatment Plant as well.

Worker Safety and Fire Protection

The SFIA Alternative would be located within an existing industrial area on San Francisco International Airport property, served by the City of South San Francisco Fire Department. The fire risks of this alternative would be similar to those of the surrounding existing uses, including the UCI cogeneration facility, and thus would pose no new or different demands on local services.

Similar to the proposed project, it would be appropriate for the project to provide a Project Demolition and Construction Injury and Illness Prevention Program and a Project Operations Safety and Health Program in order to ensure adequate levels of industrial safety.

Engineering Assessment for SFIA Site Alternative

Facility Design

The project's facility design at the SFIA Alternative site would be similar to that of the SFERP at the proposed project site. As with the proposed project, staff-recommended measures may be appropriate to ensure compliance with engineering laws, ordinances, regulations and standards applicable to the design and construction of the project.

Geology and Paleontology

The SFIA Alternative overlies land created when the tidal flats and marshes along the margin of San Francisco Bay were reclaimed by the placement of fill. A bedrock knob is also present in the subsurface, immediately west of the SFIA site. The fill probably consists of debris and construction rubble and is believed to be underlain by variable thickness of Younger Bay Mud and Bay-Side Sand, with bedrock at relatively shallow depths along the western margin of the site. Strong seismic ground shaking (peak ground acceleration of 0.6 to 0.7g) may occur at the site in the next 50 years, although no active faults are known to cross the site. Liquefaction potential also presents an adverse site condition. Pile foundations would likely be required for the major structures of this site. Adequate design parameters for the facility would need to be determined through a site-specific evaluation by a Certified Engineering Geologist or Geotechnical Engineer.

Impacts due to seismic hazards and soil conditions would be addressed through compliance with the requirements and design standards of the California Building Code. Based on previous staff assessment for this site (CEC 2002a), impacts to geologic and paleontological resources would not be expected. Mitigation of potential impacts to paleontological resources could be accomplished with construction monitoring by a resource specialist and salvaging of any identified fossils. These impacts and the measures for mitigation would be similar to those of the proposed project.

Power Plant Efficiency

The plant configuration and combustion turbine generator technology to be employed at the SFIA Alternative would be similar to the proposed project, which means it would result in similar consumption of fuel, and it would result in a similar level of efficiency.

Power Plant Reliability

The plant configuration at the SFIA Alternative would be similar to the proposed project, which means it would result in similar levels of equipment availability. Plant maintainability, fuel and water availability, and reliability of the plant in relation to natural hazards would each be similar to the proposed project.

Transmission System Engineering

The SFIA Alternative would not satisfy the requirements of the CA ISO for allowing closure of the Hunters Point Power Plant or other in-City generation; the CA ISO requires generation to be north of Martin Substation in order to close in-City generation. Therefore, this site would not meet the stated project objectives. Locating SFERP at SFIA would also require reevaluating the capacity of the transmission system serving San Francisco. Compared to the proposed project, this alternative would be more likely to cause adverse effects to the transmission system because constraints in the San Mateo-Martin corridor and at the Martin Substation would be exacerbated.

EAST BAY ALTERNATIVE, HAYWARD

Background

This site was selected because of its proximity to the site for an approved power plant, the Russell City Energy Center (RCEC; 01-AFC-7). Analysis of the proposed Russell City site and several alternatives was completed in the Final Staff Assessment for that project, which was published on June 10, 2002. While the exact site evaluated herein was not considered in that FSA, many characteristics of this alternative site are similar to those of the proposed RCEC site. The RCEC site is immediately south of the Hayward Water Pollution Control Facility (WPCF), and this site is immediately north of the WPCF.

The proposed RCEC site itself was not considered as an alternative site because that project was approved by the Energy Commission, the RCEC owner and Calpine, still has control of the site. Calpine has the authority to construct at that site at any time; therefore, evaluation of that same site as an alternative in this analysis was not considered an option that would necessarily add generation capacity to the region beyond that already approved.

Site Description

The East Bay Alternative is located at 3862 Depot Road (west of Cabot Boulevard) in unincorporated Alameda County immediately west of the City of Hayward. The site is near the southeastern shoreline of the Bay, west of the junction of Interstate 880 and Highway 92. The lot is level, comprises approximately 10.52 acres, and would involve the consolidation of two parcels with the same ownership. Based on the site layout presented for the proposed SFERP in the AFC, this site should be sufficient to accommodate three LM6000 gas turbines.

The site is centered between Depot Road (to the north) and Enterprise Avenue (to the south), and has approximately 150 feet of frontage along Depot Road. It is connected with Depot Road by an approximately 500-foot long driveway. The parcel is zoned

Industrial and is currently being used by several companies, including an auto salvage yard along Depot Road and on the southern portion there are a lumber yard, a pallets company, and Metal Masters (owner of the site). The site is currently for sale through a local broker. The Hayward WPCF abuts the property to the south. Directly west of the parcel are salt ponds that are adjacent to the San Francisco Bay. Depot Road is a busy two-lane roadway with parking shoulders on both sides.

The site would be adjacent to an Industrial Corridor designated by the City of Hayward's General Plan that extends along the western and southwestern perimeter of the City. This area contains a diverse mix of both small and large light industrial, heavy industrial, and office uses. Although some retail commercial uses and a few residences are interspersed through the area, the vicinity of the project site is predominantly industrial in nature, characterized by manufacturing, processing, and fabricating facilities; trucking, distribution, and warehouse facilities; contractor yards and construction supply; auto wrecking and vehicle storage; and miscellaneous industrial and business park developments (CEC 2002b).

The nearest residential uses to the site consist of an apartment complex, located northeast and approximately 0.7 miles from the site, and a single-family residence on Depot Road east of Clawiter Road, also approximately 0.7 miles from the site. There are several residences remaining within the Hayward and Alameda County Industrial zones on McCone and Dunn Road (approximately 0.7 miles or more from the site) and the nearest community is confined to the Mt. Eden residential area east of Industrial Boulevard and northeast of the site (Calpine 2001).

The East Bay Alternative site is also located in the vicinity of the Hayward Regional Shoreline, which encompasses 1,682 acres along the eastern shore of San Francisco Bay consisting of salt, fresh, and brackish water marshes and seasonal wetlands. The Hayward Regional Shoreline is managed by the East Bay Regional Park District and contains a large marsh restoration project (including Cogswell Marsh and Oro Loma Marsh) and hiking and bicycling trails, including a portion of the Bay Trail. The Shoreline Interpretive Center, located on Breakwater Avenue near Highway 92 (approximately 0.9 miles southwest of the RCEC site), is managed by the Hayward Area Recreation District (HARD) and features natural history, ecology, and marine life exhibits (CEC 2002b).

Infrastructure Availability

A water pipeline would travel 0.1 miles to connect to the City of Hayward's Water Pollution Control Facility (WPCF), which is adjacent to the site to the south. Secondary treated effluent may be purchased for plant process uses. This will substantially reduce the space and capital cost required for water treatment facilities (which are included in the proposed SFERP). Minimal filtering would be required for basic process water such as cooling tower makeup. Water for injection into the turbine (NO_x and Sprint systems) must be de-ionized, so this treatment step would continue to be required.

Natural gas would be supplied from a major gas local distribution line (Line 153) that parallels the Union Pacific Railroad tracks approximately 1.0 mile from the site (CEC 2002b). Gas compression would be required at the site to provide correct operating pressure for the gas turbines.

A 13.8 to 115 kilovolt (kV) step-up transformer for each unit and 115-kV on-site switchyard would be required. Approximately 1.1 miles of new 115-kV, overhead transmission line would connect the switchyard to the existing PG&E East Shore Substation via PG&E's existing East Shore to Grant 115 kV double-circuit transmission corridor, which crosses Depot Road and the Hayward WPCF approximately 600 feet east of the site. The connection would be to the East Shore Substation in a manner to be determined by PG&E.

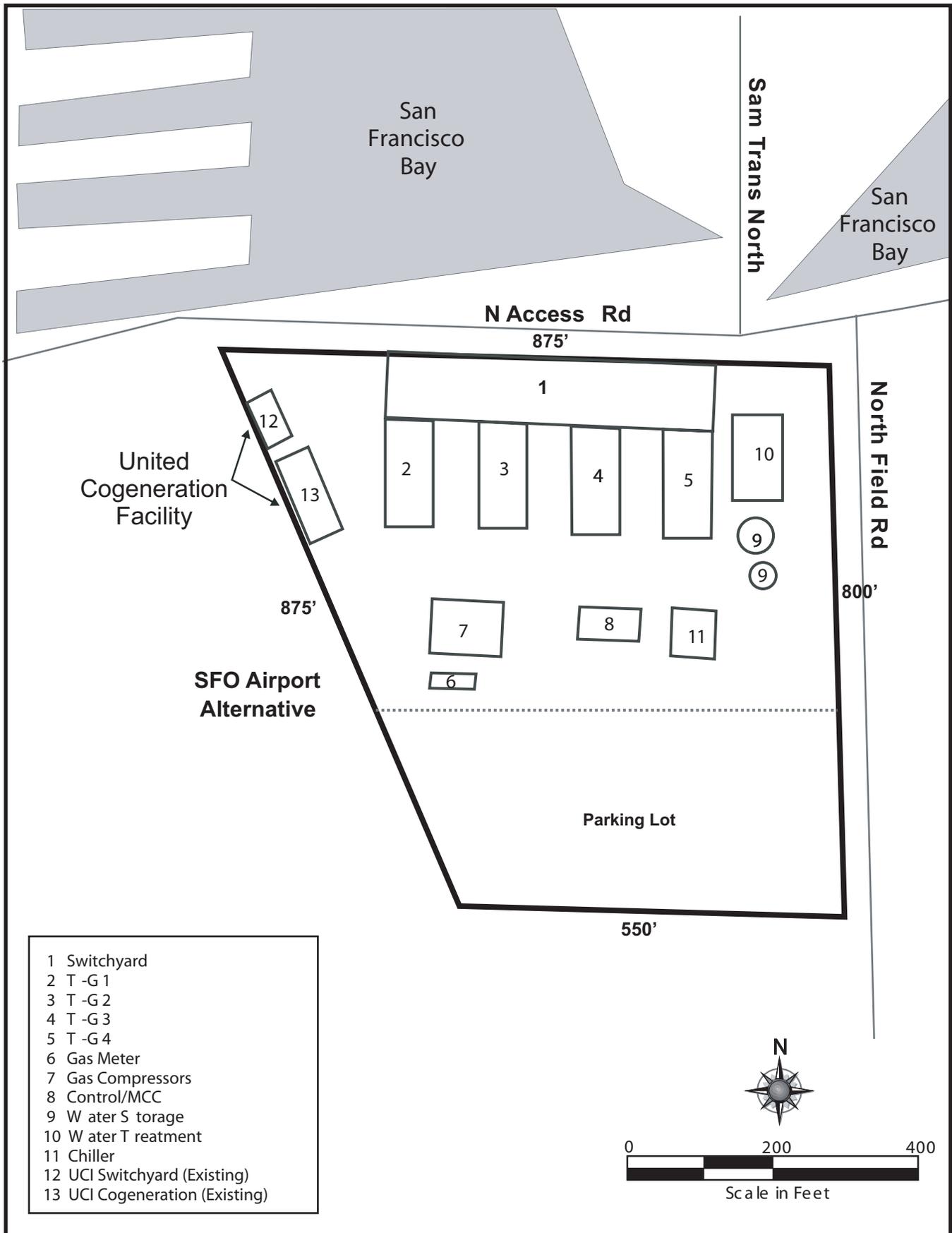
Transmission of Electricity to San Francisco. Because the SFERP is designed to provide electricity to the CCSF, this alternative site would need additional transmission to transmit the generated electricity across the Bay and north of the Martin Substation. This would occur in a similar manner as was considered in the Russell City Energy Center FSA (CEC 2002b). The power would cross the Bay from its connection point at the East Shore Substation overhead on the existing 230 kV lines that are parallel to CA-92 (the San Mateo Bridge) approximately 12.5 miles into San Mateo Substation on the western side of the Bay in San Mateo County south of CCSF.

The addition of the SFERP generation through the East Shore Substation does not, in itself, result in a need to re-conductor the East Shore to San Mateo line, because the SFERP would not trigger an overload of the line under normal conditions. Extensive transmission modeling performed for the Russell City Energy Center (RCEC) has shown, however, that this line could currently overload (pre-SFERP) under certain circumstances. Because of these potential overloads, PG&E may need to re-conductor the line, changing to a higher capacity wire to prevent line failure and power outages (RCEC 2002). Should RCEC or others cause the need for re-conducting the East Shore to San Mateo line prior to this alternative coming online, there may be sufficient capacity, but only if such new generation projects and requisite upgrades preceded SFERP.

ALTERNATIVES Figure 5 shows the location of the East Bay Alternative, and **ALTERNATIVES Figure 6** shows the potential equipment layout on the site.

ALTERNATIVES - FIGURE 5

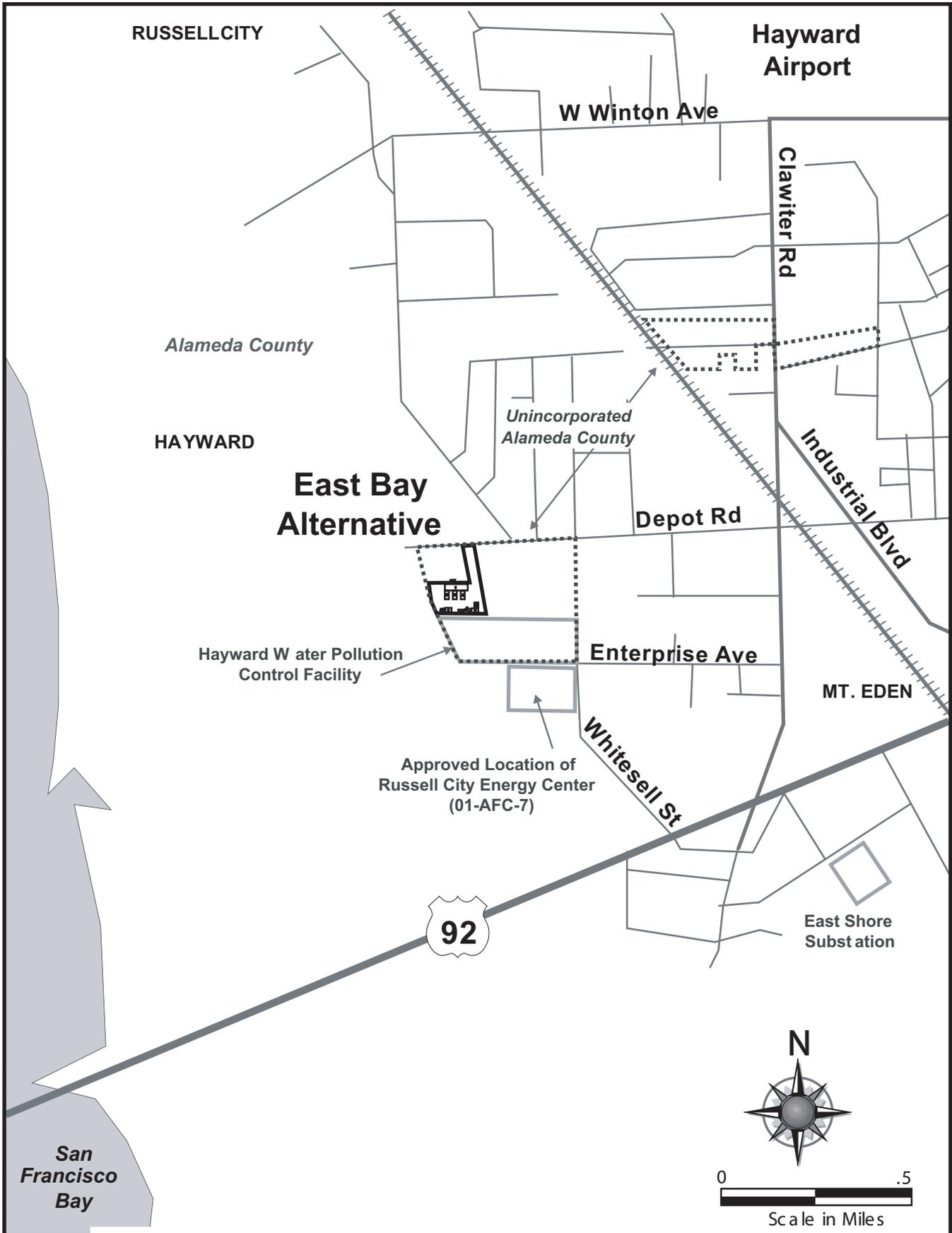
San Francisco Electric Reliability Project Supplement A - SFO Airport Alternative Site Layout



- 1 Switchyard
- 2 T -G 1
- 3 T -G 2
- 4 T -G 3
- 5 T -G 4
- 6 Gas Meter
- 7 Gas Compressors
- 8 Control/MCC
- 9 Water Storage
- 10 Water Treatment
- 11 Chiller
- 12 UCI Switchyard (Existing)
- 13 UCI Cogeneration (Existing)

ALTERNATIVES - FIGURE 6

San Francisco Electric Reliability Project Supplement A - East Bay Alternative Site Location



CALIFORNIA ENERGY COMMISSION, SYSTEMS ASSESSMENT & FACILITIES SITING DIVISION, FEBRUARY 2006

SOURCE: Aspen Environmental Group

Environmental Assessment for East Bay Site Alternative

Air Quality

Emissions from this alternative would need to be controlled to satisfy the air permitting requirements of the BAAQMD. Power plant emissions, therefore, would be identical under this alternative, but in the East Bay location. As such, construction and operation of SFERP at the East Bay Alternative would be subject to permit requirements and it would require Energy Commission mitigation, similar to that of the proposed project, to avoid significant air quality impacts. Appropriate mitigation at the East Bay Alternative would likely involve similar, locally-oriented recommendations for PM10 impacts.

Biological Resources

The East Bay Alternative site is a combination of storage lots, surrounded by industrial uses near the Hayward Shoreline. This site is east and north of the Hayward Area Parks and Recreation District's (HARD) salt marsh restoration project and the East Bay Regional Parks District's (EBRPD) Cogswell Marsh and Salt Marsh Harvest Mouse Preserve. The East Bay Alternative is approximately 2,000 feet from the nearest boundary of the industrial area with these protected areas.

Biological surveys of the East Bay Alternative were not conducted, but similar to the proposed project, the site is developed, and there is little likelihood of causing potentially significant impacts to terrestrial biological resources. The East Bay Alternative contains no surface water bodies. Storm water runoff management would be appropriate to avoid impacts to the nearby shoreline habitat, and because of the nearby marsh, specialized mitigation measures could be needed to minimize potential perch areas for predators (raptors, ravens and crows) of the salt marsh harvest mouse (federal and state Endangered) and ground-nesting birds such as the California clapper rail (federal and state listed Endangered). In addition, connecting this alternative to the local transmission grid will likely require the installation of bird flight diverters on the above-ground ground wire to lessen the likelihood of bird collisions with these small diameter wires located above the conductors. If the East Bay Alternative requires transmission line reconductoring to lessen the likelihood of transmission line overloads, then additional biological resource impacts may occur along the shoreline, and possibly in the Bay, if existing towers and conductors need replacing. If the project were located at this alternative site, the plant's air emissions would create concerns about the potential for NOx emissions to affect biological resources near the site, i.e., at the Cogswell Marsh and Salt Marsh Harvest Mouse Preserve.

Because of the proximity of the East Bay Alternative to the protected salt marsh habitat preserves and associated protected species, the overall impacts to biological resources at this alternative site would likely be greater than those that would occur with the SFERP proposed project.

Cultural Resources

Records searches and detailed site surveys for cultural resources were not completed for the East Bay Alternative, but during a pedestrian field survey, no historic structures were apparent on the parcel. Adjacent buildings, structures and linear facilities were not

evaluated to determine if they meet the eligibility requirements for the CRHR. Buried archaeological and prehistoric cultural resources may be present at the site and in the vicinity of linear facilities. Compared to the SFERP site, developing SFERP at the East Bay Alternative would be slightly less likely to have an impact on cultural resources because the site is located farther inland from the bayshore.

To avoid impacts potentially caused by disturbing buried cultural and historic resources at the East Bay Alternative, mitigation requiring oversight of a cultural resources specialist would likely be necessary; however these potential impacts would be similar to those associated with the proposed project site.

Hazardous Materials Management

Hazardous materials use, including the quantities handled during transportation and disposal, would be identical to the proposed project. The transportation route to the East Bay Alternative would occur from State Route 92, over Clawiter Road, and Depot Road, and it would generally avoid residential areas. Compared to operation of the proposed project at the SFERP site, impacts from transportation of hazardous materials would be similar because of the lack of proximity to homes. No special measures related to hazardous materials management would be required for this alternative site, and impacts during operation would be similar.

Land Use

The City of Hayward General Plan designates the East Bay Alternative with industrial zoning. The site is near but not within areas covered by the Hayward Area Shoreline Planning Agency (HASPA) and the San Francisco Bay Conservation and Development Commission (BCDC) San Francisco Bay Plan. Similar to the SFERP site, the uses surrounding the East Bay Alternative are primarily industrial, and use of the East Bay Alternative would not be likely to conflict with any applicable land use plan, policy, or regulation.

Noise

The residences nearest to the East Bay Alternative are 0.7 miles to the east on the western edge of the Mt. Eden residential area (near Depot Road and Industrial Boulevard). There are single family and multi-family homes in this area, presently exposed to a significant level of traffic noise on Depot Road and Industrial Boulevard. Compliance with the Hayward Noise Element would be likely at the nearest residential areas because of their sufficient distance from this alternative site. Compared to the proposed project, this alternative would cause similar operational noise impacts, and economical means of mitigating noise emissions to a level of insignificance would likely be available. Construction noise would cause impacts similar to those expected at the SFERP site.

Public Health

The air pollutants emitted by the SFERP at the East Bay Alternative would be identical to those that would occur at the proposed project site. As such, the project's emissions of toxic air contaminants would not be likely to expose the surrounding population to any significant risk of cancer or non-cancer health effects.

Socioeconomics

Staff has estimated the benefits from the SFERP project should it be built at the East Bay alternate site. Benefits include increases in sales taxes, employment, and income for Alameda and neighboring counties (see **SOCIOECONOMICS Table 2** for data and information). Staff finds that the SFERP 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 East Bay Alternative site is about 65 percent and it is approximately 75 percent within a one mile radius of the Russell City Energy Center site, which is less than one mile to the south. The low-income population within six miles is about 8.5 percent. In comparison, based on staff's demographic screening analysis for the proposed SFERP project, the minority population within six miles of the proposed power plant site at Potrero is less than 57 percent and the low-income population within six miles is slightly above 11 percent.

Staff finds that there would be no 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 and, therefore, there are no socioeconomic environmental justice issues. The East Bay Alternative would be consistent with the applicable socioeconomic LORS.

Traffic and Transportation

Traffic in the vicinity of the East Bay Alternative tends to be congested due to the high level of industrial activity of the surrounding uses. Similar to the proposed project, before construction could occur at the East Bay Alternative, a construction traffic control and transportation demand implementation program would need to be developed in coordination with the City of Hayward and Caltrans to limit construction-period truck and commute traffic to off-peak periods and avoid potential traffic and transportation impacts.

The East Bay Alternative would be sufficiently distant from the Hayward Municipal Airport (1.3 miles northeast of the site) so that it would not adversely affect air traffic.

Transmission Line Safety and Nuisance

The electricity from the SFERP at the East Bay Alternative would travel through a new 115 kV overhead transmission line, parallel to an existing 115 kV line for approximately 1.5 miles to the East Shore Substation. The substation would need to be modified within its fence line to accommodate its entry. Approximately 600 feet of the new transmission line would occur in a new right-of-way until it intersects with the existing East Shore-Grant corridor.

Because substantial system reinforcements may be necessary, especially to the cross-bay corridor, the transmission line safety and nuisance impacts would likely be greater than those that would occur under the proposed project. This, and the much longer line needed for this alternative site would make it less preferable than the proposed Potrero

site in terms of the total length of the source of line fields to which individuals might be exposed.

Visual Resources

Relevant key observation points from residences and a recreational area (Hayward Shoreline Interpretive Center within the Hayward Shoreline Recreational Park) would be located more than 0.7 miles from the East Bay Alternative.

The most prominent project feature at this distance would be the three 85-foot tall stacks. The stacks would be substantially taller than the surrounding industrial structures, which tend to be less than 40 feet tall. With the exception of the stacks, the horizontal form and straight lines of other project features would appear similar to the form of existing structures. The medium gray color of the project would contrast moderately with the white color of existing structures which themselves contrast highly with landforms. The project would appear co-dominant with existing structures.

The project would occupy a small portion of the wide field of view available at the Hayward Shore Interpretive Center. The spatial prominence of the project would be reduced since it would be seen entirely against the backdrop of the East Bay Hills (i.e., project structures would not extend above the ridgeline of the hills).

The project would block from view a relatively small amount of an undeveloped portion of the East Bay Hills for Interpretive Center trail users. In addition, this view blockage would be of short duration as a trail user's position relative to the project site changes.

The project would have moderately low contrast with the rolling, horizontal form of the East Bay Hills. The gray colors of the project would cause moderately low contrast with the seasonal brown and green color of the landforms. Scale contrast would be low since the project would appear much smaller than the landforms.

Similar to the proposed project, mitigation would be appropriate for minimizing the visual effects and light and glare.

The SFERP does not propose landscaping. However, the layout of the project on the East Bay Alternative site and the design of project landscaping in areas along the perimeter of the site that front on streets would require standard street trees be planted to comply with the requirements of the City of Hayward's zoning ordinance, and to provide for a continuation of the Industrial Corridor's tree canopy. The canopy created by the street trees would block views toward stacks and other tall features from nearby areas and would integrate the project into the overall visual composition of the area. Setback areas would need to be established and be landscaped with a mixture of trees, shrubs, and groundcovers to create a visually engaging composition in views from existing roads.

With the project's architectural treatment and careful landscaping around the perimeter of the site to provide maximum screening of views toward the site, the project would visually relate to its immediate setting. The project at the East Bay Alternative site would

cause adverse but not significant visual impacts that would be similar to those of the proposed project.

Waste Management

Construction at the East Bay site would require removal of automobiles from the salvage yards, and oversight of this activity may be necessary to ensure proper removal and disposal. This activity and other construction and operation activities would need to be conducted in compliance with regulations pertaining to the appropriate management of wastes. Similar to the proposed project, the project would need to implement a comprehensive program to manage hazardous wastes and obtain a hazardous waste generator identification number (required by law for any generator of hazardous wastes). The environmental impact of waste disposal would be similar to the proposed project.

Water and Soils

Contaminated soils or groundwater could be encountered at the East Bay Alternative because of previous activities that may have resulted in hydrocarbon spills. Site assessment and remediation may be necessary prior to construction, which would involve participation of the San Francisco Bay Regional Water Quality Control Board, and possibly the City of Hayward Fire Department. During construction and site preparation, if contamination is encountered, mitigation measures consisting of proper testing, treatment, and disposal would be necessary.

Plans for grading and erosion control, dewatering, and storm water pollution prevention would also need to be reviewed by local agencies, including the San Francisco Bay Regional Water Quality Control Board, the City of Hayward Public Works Department, Alameda County Public Works Agency, and the State Water Resources Control Board. These plans, procedures, and measures would be similar to those necessary for development of SFERP at the proposed project site.

Worker Safety and Fire Protection

The East Bay Alternative would be located within an existing industrial area that is currently served by the local fire department. The fire risks of this alternative would be similar to those of the surrounding existing uses, including the Hayward WPCF, and thus would pose no new or different demands on local services.

Similar to the proposed project, it would be appropriate for the project to provide a Project Demolition and Construction Injury and Illness Prevention Program and a Project Operations Safety and Health Program in order to ensure adequate levels of industrial safety.

A previous staff assessment for another power plant evaluated the availability of fire and EMS equipment, staff, and response time and found them to be adequate (CEC 2002b).

Engineering Assessment for East Bay Site Alternative

Facility Design

The project's facility design at the East Bay Alternative site would be similar to that of the SFERP at the proposed project site. As with the proposed project, staff-recommended measures may be appropriate to ensure compliance with engineering

laws, ordinances, regulations and standards applicable to the design and construction of the project.

Geology and Paleontology

Strong seismic ground shaking is probable at the site, and this may be amplified by young Bay mud and unconsolidated sediments underlying the site. The site may also be subject to expansive soil conditions (i.e., soils that swell when saturated). Adequate design parameters for the facility would need to be determined through a site specific evaluation by a Certified Engineering Geologist or Geotechnical Engineer.

Impacts due to seismic hazards and soil conditions would need to be mitigated by complying with the requirements and design standards of the California Building Code and standards adopted by the City of Hayward Public Works Department. Based on the assessment for the nearby (proposed) Russell City Energy Center, impacts to geologic resources would not be expected. Mitigation of potential impacts to paleontological resources could be accomplished with construction monitoring by a paleontological resources specialist and salvaging of any identified fossils. These impacts and the measures for mitigation would be similar to those of the proposed project.

Power Plant Efficiency

The plant configuration and combustion turbine generator technology to be employed at the East Bay Alternative would be similar to the proposed project, which means it would result in similar consumption of fuel, and it would result in a similar level of efficiency.

Power Plant Reliability

The plant configuration at the East Bay Alternative would be similar to the proposed project, which means it would result in similar levels of equipment availability. Plant maintainability, fuel and water availability, and reliability of the plant in relation to natural hazards would each be similar to the proposed project.

Transmission System Engineering

The East Bay Alternative would not satisfy one of the CA ISO's requirements for a generator that would allow closure of in-City generation, including the Hunters Point Power Plant and Potrero Unit 3: locating a generator on the San Francisco Peninsula, north of the Martin Substation, which is also a stated project objective. Locating SFERP in the East Bay would also require reevaluation of the capability of the transmission system, especially the existing cross-bay connections that would bring the power generated to CCSF. In addition, based on the staff assessment for the proposed RCEC, there is a possibility that use of the East Bay Alternative for SFERP would overload portions of the transmission system (CEC 2002b). Higher capacity conductors between the East Shore and San Mateo Substations may be required to ensure full output of the SFERP at this site, and modifications to the East Shore Substation would also be required. Similar modifications to the transmission system may be necessary to ensure full output of SFERP if RCEC were constructed first. Additional transmission constraints may also be encountered between the San Mateo Substation and San Francisco.

POTRERO POWER PLANT UNIT 7

Alternative Description

Mirant Potrero, LLC (Mirant) filed its original Application for Certification (AFC) on May 31, 2000, for the Potrero Power Plant Unit 7 Project, which would be a nominal 540 MW natural gas-fired, combined cycle power generating facility. Mirant proposed to construct and operate the plant as an expansion of its existing Potrero Power Plant (Units 3 through 6) that is located on the eastern edge of the CCSF. This site was originally considered for the proposed SFERP; however, the City was unable to conclude an option agreement with Mirant for the purchase of the site. Therefore, the location of the proposed SFERP was changed and the Potrero Power Plant site was instead considered as an alternative (the Mirant Site) in the Supplemental Application for Certification (SFPUC 2005a).

The existing Potrero Power Plant, located on 26 acres approximately 0.5 miles north of the proposed SFERP and adjacent to Potrero Substation, is one of two power plants in California that are required to maintain dual-fueled capabilities (natural gas and fuel oil) by the CA ISO. Major existing site features include:

- Unit 3, a 206-MW, steam turbine generator that has dual-fuel capabilities, natural gas and Bunker C fuel oil. Its normal, and current, mode of operation is natural gas firing. Conversion of Unit 3 to use Bunker C should it be required due to partial or full loss of other generation and/or transmission sources, would take approximately 10 days. Unit 3 features a once-through power plant cooling system comprised of intake/outfall structures (CEC 2002a). These structures would be replaced by new intake/discharge systems as a part of the Unit 7 project.
- Three distillate-fired 52-MW peaking units, Units 4, 5 and 6 (totaling 156-MW).
- Three fuel tanks. Tanks Numbers 3 and 4 are filled with Bunker C fuel oil for emergency operation of Unit 3 should natural gas service be interrupted. Tank Number 5 holds the distillate fuel for the peaking Units 4, 5 and 6.
- Station A Complex: turbine room, pump house and gatehouse.
- Gas plant structures: Meter House and Compressor House.

The Unit 7 plant would be located in west-center portion of the site where the existing turbine building stands. Unit 7 would feature two Combustion Turbine Generators (CTGs) and one Steam Turbine Generator (STG). Heat generated from each CTG (a combustion cycle) would flow through a separate Heat Recovery Steam Generator (HRSG) where steam would be produced, which would be used to drive the STG (a steam cycle). This two CTG/HRSG and one STG set up is referred to as a “two-on-one” combined-cycle configuration. Pollution controls on each CTG/HRSG “train” would include a Selective Catalytic Reduction (SCR) system to control the emissions of oxides of nitrogen (NO_x), and a CO catalyst to control carbon monoxide emissions. Aqueous ammonia would be used as the reagent in Unit 7’s SCR system. Deliveries will be made by tanker trucks and stored in two new and identical, 20,000-gallon aboveground storage tanks. One tank would be used for Unit 7; with the second tank provided for the Unit 3 SCR retrofit, which is required for compliance with Bay Area Air Quality Management District regulations.

In the January 19 and 31, 2001, amendments to the AFC, Mirant added the demolition of six existing structures to the project. The Station A Complex (turbine room, office, pump house and gate house) and the Meter House and Compressor House were originally slated to be removed under permits issued by the CCSF, but due to urgings by the CCSF and delays, demolition was included in the Energy Commission's Staff Assessment process.

In its original application, Mirant proposed to use water from San Francisco Bay for circulating cooling purposes at the rate of 158,000 gallons per minute (228 million gallons per day). Energy Commission staff in its Final Staff Assessment (FSA) for the project (February 11, 2002) recommended that the project be licensed with mitigation, including replacement of the proposed once-through cooling system with an alternative cooling system. Two cooling options were recommended by Energy Commission staff: a hybrid cooling system that would use reclaimed water and cooling towers, or a dry cooling system that could cool power plant exhaust without use of substantial quantities of water. The FSA identified significant impacts that would result if Mirant implemented its proposed once-through cooling system. In response, in mid-2003, Mirant filed an AFC amendment that analyzed the use of recycled-water cooling systems and proposed use of hybrid cooling, eliminating the previously proposed once-through cooling system.

Mirant requested certification of the project with both cooling system alternatives. Because the original proposal to use a once-through power plant cooling system was not supported by staff in the February 11, 2002, FSA, this staff assessment considers only the hybrid (wet/dry) option to be feasible. The hybrid cooling option would use recycled water from the SEWPCP within a wet/dry plume abated cooling tower at the Unit 7 site. It would require construction of new pump stations and pipelines between the Potrero site and the SEWPCP to convey secondary effluent water from the SEWPCP and return blowdown and sludge water from the Unit 7 power plant. This would avoid potentially significant impacts to aquatic biological resources that were identified for the once-through cooling option.

Mirant Corporation filed for bankruptcy protection on July 14, 2003, and in early November 2003, it requested that review of the AFC be suspended. A year suspension to November 15, 2004 was granted by the Committee and a second request was granted extending the current suspension for another year to November 15, 2005. The suspension order requires that Mirant provide a 45-day notice of their intent to reactivate the proceedings.

It is not certain that the Potrero Unit 7 project could be permitted with either the once-through or hybrid cooling systems. Even if the effects on aquatic resources were eliminated, there was substantial public concern about the effect of Potrero Unit 7 on public health and safety, as well as environmental justice issues due to effects of the proposed plant on areas with disproportionately high minority and low-income populations. The CCSF would have to approve the Potrero Unit 7 project because either cooling option would require a permit from the City (or its Port Authority).

Despite the CCSF's stated opposition to the Potrero Unit 7 project, it is being considered as an alternative to the SFERP, because Mirant could continue with its

application process and construction of the Potrero Unit 7 Project. The Energy Commission believes that it is important that a comparison of the potential impacts of Potrero Unit 7 Project with the impacts of the SFERP be presented for review by the public and affected agencies.

Infrastructure Availability

The natural gas pipeline currently serving Potrero Units 3 through 6 would fuel the proposed Unit 7. A pipe tie-in would be made to the gas distribution line and this service will be connected to a compressor station that would be part of Unit 7.

Interconnection with the State's high voltage transmission system would be through the new Potrero Power Plant Switchyard, located onsite, and to two existing PG&E substations. These would be a direct interconnection to PG&E's Potrero Substation adjacent to the Potrero Power Plant, and a separate underground interconnection to the Hunters Point Substation located approximately 1.8 miles to the south of the Potrero Power Plant site. This interconnection was originally part of the Potrero Power Plant Unit 7 AFC, but it is currently being evaluated by the CPUC in response to an application from PG&E to construct the underground 115 kV transmission line, and would not be part of the Potrero Unit 7 project if it were reconsidered.

ALTERNATIVES Figure 1 shows the location of the Potrero Power Plant.

Environmental Assessment for Potrero Unit 7 Alternative

Air Quality

The range of air pollutants emitted by the Potrero Power Plant Unit 7 alternative would be similar to those that would occur with proposed project because both would fire large quantities of natural gas. All emissions from the Potrero Power Plant Unit 7 alternative would need to be controlled to satisfy the air permitting requirements of the BAAQMD. As such, construction and operation of Unit 7 would be subject to BAAQMD requirements set forth in the Energy Commission permit. The Unit 7 alternative would provide a more efficient level of electrical output per pound of pollution generated. Compared to the SFERP, which would create 0.09 pounds of NOx per megawatt-hour (lb/MW-hr) (SFERP 2004a), the Unit 7 alternative would emit NOx at a rate of approximately 0.07 lb/MW-hr. The following table (**ALTERNATIVES: Table 3**) shows the criteria pollutant emissions during routine operation of the 540 MW Unit 7 alternative compared with operation of the proposed 145 MW SFERP.

**ALTERNATIVES Table 3
Comparison of Maximum Hourly and Annual Emissions**

Equipment/Sources	NOx		PM10		CO		SOx		VOC	
	(lb/hr)	(tpy)								
Unit 7 Alternative Total	40	138	26	96	60	206	6	20	11	38
SFERP Total	13	40	9	18	13	28	1	3	4	8

Sources: Potrero Unit 7 AFC Cooling Tower System Amendment Table 8.1-6 (steady state with duct burners, including cooling tower emissions; annual basis: 7,446 hours per year); SFERP AFC Table 8.1-17 (steady state; annual basis: approximately 4,000 hours per year).

Air quality impacts from the Potrero Power Plant Unit 7 alternative would be greater than those under the proposed project, and they would require additional mitigation for localized PM10 impacts. Mitigation required for the Potrero Power Plant Unit 7 alternative would likely be similar in nature to that necessary for SFERP, but it would need to be in substantially greater quantities.

Biological Resources - Aquatic

The Potrero Power Plant Unit 7 alternative with once-through cooling would cause significant impacts to aquatic biological resources. To address this, staff previously recommended alternative technologies for cooling as a means of avoiding significant impacts related to the loss of planktonic organisms from once-through cooling. Impacts to aquatic biology would be much more severe with the Unit 7 alternative with once-through cooling when compared to the proposed project.

The hybrid (wet/dry) cooling system option, proposed by Mirant in July 2003 (Potrero Power Plant Unit 7 AFC Cooling Tower Amendment), would avoid nearly all impacts to aquatic biological resources. With the hybrid cooling option, the Potrero Power Plant Unit 7 alternative would not be expected to cause significant impacts to aquatic biological resources because all blowdown and sludge water from the cooling system would be returned to the SEWPCP for treatment. With this cooling system, the impacts of the Potrero Power Plant Unit 7 alternative would be similar to those of the proposed project.

Biological Resources - Terrestrial

The Potrero Power Plant Unit 7 alternative would require temporary use of temporary laydown facilities either at Pier 80 or Pier 96. This would involve a large area of construction activity, but it would occur on urban and disturbed lands, where no potentially significant impacts to terrestrial biological resources would be expected. Although more land would be disturbed with this alternative, potential impacts to terrestrial biology during construction would be similar to those of the proposed project. If the project were located at this alternative site, it would have similar NOx emission concerns for biological resources as the proposed project site. Storm water runoff management would be essential to avoid impacts to the surface waters.

During operation of the Potrero Power Plant Unit 7 alternative, bird collisions with the exhaust stacks may occur, but as with the proposed project, these impacts would not be considered significant.

Cultural Resources

The Potrero Power Plant Unit 7 alternative would require mitigation to avoid potentially significant impacts related to disturbing buried archaeological resources. At the time of the Energy Commission's analysis, potentially significant impacts were identified due to the possible demolition of the historic Meter House and Compressor House at the site. Staff previously recommended relocating them elsewhere in San Francisco for preservation (CEC 2002a). During hearings on the Potrero Unit 7 case, staff determined that no feasible locations were available for the Meter House and the Compressor House. Since the structures could not be moved, the demolition of the

Compressor House and the Meter House were found to result in an unmitigable significant impact. The demolition of both the Meter House and the Compressor House would be much more severe impacts than historic resource impacts under the SFERP project.

However, on May 4, 2005 the San Francisco Planning Department issued a Notification of Project Receiving Environmental Review stating that the City will be performing an environmental review on the demolition of the Station A buildings at Potrero Power Plant due to seismic risks. This proposed demolition would include the Station A Turbine, Compressor House, Meter House, and Gate House Buildings. If this demolition were to occur prior to construction of Potrero Unit 7, this impact would not be attributed to the Potrero Unit 7 project and cultural resources impacts between the two sites would be similar. However, as of October 17, 2005, the environmental review process has not begun and a consultant to prepare the Environmental Impact Report under CEQA has not been selected by Mirant. Therefore, it will be at least a year (late 2006) before this project could move forward (Kienker 2005).

Hazardous Materials Management

Construction of the Potrero Power Plant Unit 7 alternative would require use of small quantities of hazardous materials, such as lubricating oils and fuels. Operation of the combined-cycle power plant would similarly involve some use of oils and fuels, and it would also require transportation, handling and use of hazardous materials in large quantities. For air pollution control systems, substantial quantities of aqueous ammonia would need to be delivered to the site and stored. There would be a risk of impacts if a catastrophic accidental release of ammonia occurred, but staff previously assessed such a scenario and found that significant concentrations would not result off-site (CEC 2002a). Large quantities of other materials would also be used, such as sulfuric acid, sodium hypochlorite, and petroleum fuels.

These materials would be present at the site in quantities greater than those under the proposed project. Because of the large quantities, a Risk Management Plan and Safety Management Plan would be required for ensuring safe management of these materials, as it would be for the proposed SFERP project. The U.S. EPA and CCSF would be required to review and oversee implementation of the management plans, in conjunction with Energy Commission staff. Compared to the proposed project, impacts from transportation of the larger quantities of hazardous materials would be increased under the Unit 7 alternative but would remain an insignificant risk.

Land Use

The City and County of San Francisco's Central Waterfront Area Plan designates the Potrero Unit 7 site with zoning for heavy industry. The site is adjacent but not within properties covered by the plans of the Port of San Francisco. The BCDC's San Francisco Bay Plan would only apply to portions of the Potrero Power Plant Unit 7 alternative associated with the proposed once-through cooling system. With the hybrid cooling option, no portion of the Potrero Power Plant Unit 7 alternative would be within the jurisdiction of the BCDC. Measures that would be appropriate under the proposed project, to facilitate access to the shoreline and the San Francisco Bay Trail, consistent with BCDC and local recommendations, would also be applicable to this alternative. As

with the proposed project, the Potrero Power Plant Unit 7 alternative would not be likely to conflict with any applicable land use plan, policy, or regulation.

Infrastructure necessary for the Potrero Power Plant Unit 7 alternative may include underground pipelines connecting to the SEWPCP for reclaimed water. Such off-site improvements would need to be coordinated with other ongoing projects in the vicinity, such as the Municipal Railway Metro East Light Rail Maintenance and Operations Facility and the Third Street Light Rail Transit Line. Compared to the proposed SFERP, construction of this off-site infrastructure would require more rigorous coordination with local agencies.

Noise

The nearest residentially-zoned residence with a direct line of site to the Potrero Power Plant Unit 7 alternative would be approximately 1,200 feet from the facility. This location is presently exposed to a significant level of traffic noise from surrounding surface streets. Compliance with the CCSF Zoning Code would be likely at the nearest existing residences, including newer live/work projects near the site, primarily because of their industrial zoning. The Potrero Power Plant Unit 7 alternative may, however, cause a significant noise increase at an adjacent live/work property if the hybrid cooling option is selected, because the wet/dry cooling tower would include numerous large diameter fans, which may warrant a special noise-reducing design.

Potentially significant noise from power plant components can typically be reduced with economical design modifications. Mitigation measures to minimize the noise increases with the Potrero Power Plant Unit 7 alternative would be similar to those recommended for the proposed SFERP. Although staff has not completed a detailed assessment of the Potrero Power Plant Unit 7 alternative with the hybrid cooling option, low-speed fans could be employed in the wet/dry cooling tower if they would be necessary to avoid a significant noise increase. Construction noise would cause impacts slightly greater than those anticipated for SFERP because they would occur over a longer duration. Although noise impacts would be slightly greater than with the proposed project, measures would be available to mitigate all potentially significant impacts.

Public Health

The range of air pollutants emitted by the Potrero Power Plant Unit 7 alternative would be similar to those that would occur with proposed project because both would fire large quantities of natural gas. The toxic contaminant that would be emitted in the greatest quantities by the 540 MW Potrero Power Plant Unit 7 alternative would be ammonia, which could be emitted by the facility at a maximum rate of approximately 60 pounds per hour (SECAL 2000). This can be compared to the 145 MW SFERP, which could emit ammonia at a maximum rate of 19.6 lb/hr (SECAL 2000). The Unit 7 alternative would emit greater quantities of toxic air contaminants. However, similar to the proposed project, this alternative would not be likely to expose the surrounding population to any significant risk of cancer or non-cancer health effects.

Socioeconomics

Staff has estimated the benefits from the SFERP project should it be built at the Potrero Power Plant Unit 7 site. Benefits include increases in sales taxes, employment, and

income for San Francisco and neighboring counties (see **SOCIOECONOMICS Table 2** for data and information). Staff finds that the SFERP 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 Potrero Power Plant Unit 7 site (where both the SFERP and the Potrero Unit 7 alternative would be located) is about 57 percent (within one mile the minority population is 51 percent), though there are individual census blocks with greater than 75 percent minority population. The low-income population within six miles is approximately 11 percent.

Staff finds that there would be no 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 and, therefore, there are no socioeconomic environmental justice issues. As was determined in the Staff Assessment for the Potrero Power Plant Unit 7, the Potrero Power Plant Unit 7 alternative would be consistent with the applicable socioeconomic LORS (CEC 2002a).

Traffic and Transportation

The high level of industrial activity of the surrounding uses generates a substantial level of truck traffic. Similar to the proposed project, before construction could occur for the Potrero Power Plant Unit 7 alternative, a construction traffic control and transportation demand implementation program would need to be developed in coordination with the CCSF and Caltrans. These programs would limit construction-period truck and commute traffic to off-peak periods and avoid potential traffic and transportation impacts.

The Potrero Power Plant Unit 7 alternative would have the potential to cause a greater disruption of local streets due to its longer construction schedule and off-site infrastructure that would be necessary. While the proposed project would require approximately 0.75 miles of construction in city streets to install the process water supply pipeline, the Potrero Power Plant Unit 7 alternative may require additional pipelines to the SEWPCP if the hybrid cooling option is included. Although these impacts would be more severe than those of the proposed project, they would be less than significant through proper coordination with local agencies.

Transmission Line Safety and Nuisance

The electricity from the Potrero Power Plant Unit 7 alternative would travel through two paths: an interconnection to the existing Potrero Substation, and an underground 115 kV transmission line for approximately 1.8 miles in city streets to the Hunters Point Substation. Compared to the proposed project, which would only connect to the adjacent Potrero Substation (3,000 feet of underground line), this alternative would be slightly more likely to cause transmission line safety hazards or nuisances.

Visual Resources

The Potrero Power Plant Unit 7 alternative would occur less than 0.5 miles from the site of the proposed project, within the highly urbanized western shore of the San Francisco

Bay. The same visual setting and key observation points (KOP) that apply to the SFERP would also apply to this alternative.

The most visible features of the Potrero Power Plant Unit 7 alternative would include two 60-foot tall air inlets to the combustion turbine generators, the 60-foot tall steam turbine generator, the 94-foot tall heat recovery steam generator trains, and two 180-foot tall stacks. If the hybrid cooling option is selected, the wet/dry cooling tower would also be a prominent structure at 70 feet high, with a footprint of 670 feet by 60 feet. The cooling tower would also generate steam plumes, especially during cool and wet weather, although the hybrid design would substantially abate the frequency of visible plumes. Other features of the Potrero Power Plant Unit 7 alternative would include an expansion to the Potrero Substation switchyard and possibly the once-through cooling water intake structure, adjacent to the shoreline. The existing 300-foot stack that dominates most views of the area would remain in place under this alternative.

Numerous residences at elevated locations on Potrero Hill would have a view of the site. While residents generally anticipate open, frontal views of a highly urbanized, industrial waterfront landscape, any new industrial features in the views of the Bay would be perceived as detracting from the more scenic elements of the view.

Relevant observation points, including existing residences and recreational areas, would be located approximately 0.5 miles away from the site, which puts the site between the foreground and middle-ground viewing distances for viewers. The Potrero Power Plant Unit 7 alternative would introduce prominent structures of industrial character into the foreground to middle-ground of views from nearby residences and recreation areas. The existing landscape is industrial in appearance with forms, lines, and characteristics similar to those of this alternative. Given this setting and the distances to observation points, the Potrero Power Plant Unit 7 alternative would be co-dominant with existing structures, and would have a low to moderate degree of visual contrast depending on viewpoint. In the context of the site's overall moderate visual impact susceptibility, the resulting visual impact would be considered adverse but not significant. Similar to the proposed project, mitigation would be appropriate for minimizing the visual effects and light and glare.

Similar to the proposed project, it would be difficult for the Potrero Unit 7 alternative to incorporate power plant structure design that would enhance the pleasure of the user or viewer of the Bay or preserve views of the Bay and shoreline, and to ensure that public access is consistent with the BCDC Public Access Design Guidelines. Presently, the only view of the Bay from Illinois Street in the project vicinity is looking down 23rd Street. This alternative may require architectural screening of the project's HRSG and the exhaust stacks; similar to the red brick building façade proposed for the original Potrero Unit 7 project. The SFERP does not propose landscape screening because it involves smaller and less bulky structures than the Unit 7 project and is outside of the jurisdictional boundary of the BCDC. The SFERP is also located farther from residences.

The Unit 7 alternative would increase the structural density and limit visual access across the site and views of the Bay. Under the present circumstances, views from

Illinois Street across the undeveloped site of the future light rail maintenance and operation facility to this alternative site are unobstructed.

Waste Management

Hazardous and non-hazardous wastes would be generated during construction and operation. Construction wastes would be generated, similar to that of the proposed project, but in larger quantities due to the longer and more intense construction schedule. There would also be an increased likelihood of encountering unknown contamination during off-site construction excavations that would be required under this alternative (including the transmission cable and possibly pipelines); however, managing such wastes would require oversight by the San Francisco Department of Public Health, the San Francisco Bay Regional Water Quality Control Board, and the Department of Toxic Substances Control. If the once-through cooling option is selected for the Potrero Power Plant Unit 7 alternative, contaminated off-shore sediment could be disturbed during construction of the cooling water intake structure. Dredged material would need to be transferred to land and disposed at an appropriate facility. The environmental impact of dredged material disposal would be greater than the impacts associated with the proposed project.

All construction and operation activities would need to be conducted in compliance with regulations pertaining to the management of hazardous wastes. As with the proposed project, it would be appropriate for the project to implement a comprehensive program to manage hazardous wastes and obtain a hazardous waste generator identification number (required by law for any generator of hazardous wastes).

Water and Soils

Contaminated soils or groundwater could be encountered under this alternative because of the excavations that would be necessary to install off-site underground infrastructure (including possible pipelines for the hybrid cooling option). Although there would be an increased likelihood of encountering unknown contamination, site assessment and remediation would involve participation of oversight agencies so that potential impacts to water and soil resources from contamination would be similar to those of the proposed project.

Plans for grading and erosion control, dewatering, and storm water pollution prevention would also need to be reviewed by local agencies, including the San Francisco Bay Regional Water Quality Control Board, the San Francisco Public Utilities Commission Bureau of Environmental Regulation and Management, and the State Water Resources Control Board. These plans, procedures, and measures would be similar to those necessary for development of SFERP.

The Potrero Power Plant Unit 7 alternative could substantially affect surface water quality if the once-through cooling option is selected. Approximately 158,000 gallons per minute of seawater would be circulated for the heat rejection cycle under this option. This would cause a discharge of a thermal plume and biological waste to the San Francisco Bay. Cooling water intake structures and thermal discharges are regulated through Section 316 of the Clean Water Act, which requires minimizing the environmental effects caused by the new structures and the associated thermal discharges. The U.S.

EPA defines the standards for intake structures and would ensure that the best technology available (BTA) is used. The State Water Resources Control Board also manages the adverse effects of thermal waste through the California Thermal Plan.³ The U.S. Army Corp of Engineers, the San Francisco Bay Regional Water Quality Control Board, and the Bay Conservation and Development Commission would also oversee various aspects of the dredging, installation, and operation of the intake structure. Compared to the proposed project, which would not use seawater for any purpose, construction and operation of the Unit 7 alternative with the once-through cooling option would cause substantially greater impacts to marine water quality.

The Potrero Power Plant Unit 7 alternative with the hybrid cooling option would avoid the impacts to marine water quality by eliminating use of seawater for any purpose. This option would use recycled water from the SEWPCP for cooling. The secondary effluent water would be delivered from the SEWPCP and returned as blowdown and sludge water in new pipelines that would essentially avoid impacts to surface water during all phases of operation. With the hybrid cooling option, the Unit 7 alternative would result in impacts to water and soil resources that would be similar to those of the proposed SFERP.

Worker Safety and Fire Protection

The Potrero Power Plant Unit 7 alternative would be located within an existing industrial area that is currently served by the San Francisco Fire Department. The fire risks of this alternative would be similar to those of the surrounding existing uses, including the existing Potrero Unit 3 Power Plant, and thus would pose no new or different demands on local services.

Similar to the proposed project, it would be appropriate for the project to provide a Project Demolition and Construction Injury and Illness Prevention Program and a Project Operations Safety and Health Program in order to ensure adequate levels of industrial safety.

Engineering Assessment for Potrero Unit 7 Alternative

Facility Design

The facility design of the Potrero Power Plant Unit 7 would be similar to that of the SFERP. A combined-cycle plant (i.e., Potrero Unit 7) would require more major equipment and structures than a simple-cycle plant (i.e., SFERP) due to the addition of the steam turbine(s), Heat Recovery Steam Generator Unit(s), and the condenser and cooling system. However, these equipment and structures are standard and staff does not analyze them in the Facility Design section.

Therefore, similar to the proposed project, staff-recommended measures may be appropriate to ensure compliance with engineering laws, ordinances, regulations and standards applicable to the design and construction of the project.

³ The official name of the California Thermal Plan is the 1972 Water Quality Control Plan for the Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries of California.

Geology and Paleontology

Strong seismic ground shaking (peak ground acceleration of 0.6g to 0.65g) is probable at the site, although no active faults are known to cross this site. Liquefaction potential also presents an adverse site condition. Adequate design parameters for the facility would need to be determined through a site-specific evaluation by a Certified Engineering Geologist or Geotechnical Engineer.

Impacts due to seismic hazards and soil conditions would be addressed by compliance with the requirements and design standards of the California Building Code. Based on the previous staff assessment for Potrero Power Plant Unit 7, impacts to geologic resources would not be expected (CEC 2002a). Mitigation of potential impacts to paleontological resources could be accomplished with construction monitoring by a paleontological resources specialist and salvaging of any identified fossils. These impacts and the measures for mitigation would be similar to those of the proposed project.

Power Plant Efficiency

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. The two-on-one combined-cycle power plant design of the Potrero Power Plant Unit 7 project is capable of achieving an overall fuel efficiency of approximately 56 percent. The SFERP, a simple-cycle peaking facility, would achieve an efficiency of approximately 36 percent (SFERP 2004a). Although the efficiency of SFERP is high for a simple cycle plant, the Potrero Power Plant Unit 7 would provide a much higher thermal efficiency. Unfortunately, the two-on-one combined cycle configuration of the Potrero Power Plant Unit 7, which is well suited for baseload electrical generation, is not suitable to meet the project objective of supplying peaking power to the City of San Francisco. The simple cycle configuration of the SFERP is well suited for providing peaking power due to its short start-up time and fast ramping⁴ capability, which the combined cycle configuration of the Potrero Power Plant Unit 7 is not able to achieve.

The gas turbines that would be employed in either Potrero Power Plant Unit 7 or the SFERP represent two of the most modern and efficient such machines now available.

Power Plant Reliability

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>). The Potrero Power Plant Unit 7 combined cycle facility would be designed to operate as a baseload facility. NERC reports that the availability factor for combined cycle units of all sizes was 89.94 percent as compared to the 91.05 percent for simple cycle units of all sizes, for the years 1998 through 2002 (NERC 2003). While the SFERP, which is designed as a simple cycle peaking facility, enjoys a slight advantage in overall

⁴ Ramping is increasing and decreasing electrical output to meet fluctuating load requirements.

availability over the combined cycle facility, any difference between the two configurations in overall availability will be relatively insignificant.

The gas turbines that will be employed in either the Potrero Power Plant Unit 7 or the SFERP have been on the market for several years now, and can be expected to exhibit typically high availability to operate when called upon.

The fact that the Potrero Power Plant Unit 7 project consists of two trains of gas turbine generators/HRSGs provides inherent reliability. Failure of a non-redundant component of one train should not cause the other train to fail, thus allowing the plant to continue to generate at reduced output. The SFERP consists of three combustion turbine generators configured as independent equipment trains, which also provides inherent reliability. A single equipment failure cannot disable more than one train, thus allowing the plant to continue to generate (at reduced output).

Therefore, both the SFERP and the Potrero Power Plant Unit 7 project should provide an adequate level of reliability, however Potrero Unit 7 is slightly less preferred because a simple cycle plant, such as SFERP, would be able to get online faster and the Potrero Unit 7 design would have only a single condenser servicing all of the turbines, which could create a redundancy problem that could lead to the entire facility going down in the event of failure. At SFERP, each of the three turbines could continue to operate independent of problems at the other turbines.

Transmission System Engineering

The Potrero Power Plant Unit 7 combined-cycle facility would satisfy a basic objective of SFERP to provide generation within San Francisco. Compared to the proposed SFERP, the substantially greater electrical output of this alternative would require some mitigation measures potentially including a system protection scheme and replacement of circuit breakers. SFERP requires no mitigation measures.

The electricity from the Potrero Power Plant Unit 7 alternative would travel through two paths: an interconnection to the existing Potrero Substation, and an underground 115 kV transmission line for approximately 1.8 miles in city streets to the Hunters Point Substation.

Assuming no other units are retired, compared to the proposed project, this alternative would alleviate the need for future transmission improvements in the region by introducing a substantial new source of reliable, base-load power within San Francisco. However, because Potrero Unit 7 was not designed with a bypass for the steam unit (HRSG), if you lost the steam unit then you lose the entire plant output. Therefore, the CA ISO considers the entire 540 MW project as a single contingency (G-1). There is a way to design around this so the combustion turbines could still operate when the HRSG was out, however, for transmission planning purposes and reliability studies, the addition of Unit 7 was only considered to be a 270 MW increase in generation, assuming the nothing was retired when the unit came on line.

As mentioned above, Potrero Unit 7 represents a significant source of real and reactive power to serve loads in the immediate San Francisco Peninsula Area; such resources

substantially reduce the need to import power over already stressed transmission facilities. However, if the Hunters Point Power Plant were retired after Potrero Unit 7 is added, the addition of Potrero Unit 7 would not defer any currently planned transmission facilities. Instead, Potrero Unit 7 may offset the need for other additional transmission reinforcements (beyond those already in the PG&E transmission plan). Potrero Unit 7 will displace significant transmission upgrades that would be required to maintain reliability if Hunters Point Power Plant is retired without the addition of new generation in San Francisco such as Potrero Unit 7.

TRANS BAY CABLE PROJECT

Background

The CA ISO's San Francisco Action Plan, approved by the CA ISO Board in November 2004, defines the new facilities that are necessary before the CA ISO would release all existing in-City generation at Hunter's Point and Potrero Power Plants from applicable RMR agreements (SFPUC 2005a). The SF Action Plan represents the interests of stakeholders who have participated in the public process, and is considered by those stakeholders to be the most direct path to achieving the goal of retirement of all older generation at Hunters Point and Potrero, while at the same time meeting the reliability requirements for the entire San Francisco Peninsula Area (DeShazo 2005). Assuming the approval of the SFERP, the Plan will be fully implemented by the end of 2007 with the proposed SFERP as an integral part of the Plan.

From the CA ISO's perspective, for the Trans Bay Cable Project to be considered an alternative to the SFERP would imply that the Trans Bay Cable Project could replace the SFERP in the SF Action Plan. Neither the CA ISO nor the stakeholders concur with that assertion, because the Trans Bay Cable is being planned to *follow* the SF Action Plan to establish a long-term reliable load-serving project for importation of electric power. The Trans Bay Cable is tentatively scheduled for completion in the fourth quarter of 2008 which is beyond the need of the SF Action Plan (DeShazo 2005). The CA ISO considers the Trans Bay Cable as an alternative to the SFERP only in that it would augment the long-term load serving capability for the San Francisco Peninsula Area, but the implementation of the SF Action Plan (which includes SFERP) is presently the appropriate solution for the San Francisco Peninsula Area to remove the existing Hunters Point and Potrero Power Plant generator units from RMR status as soon as possible (DeShazo 2005). Overall, in the CA ISO's view, the 400-MW Trans Bay Cable Project would add its load-serving capability *in addition to* the SF Action Plan and it would not take the place of part(s) of it. The timing of the Trans Bay Cable Project is to be in place as needed and justified following successful completion of all parts of the Action Plan.

In deciding on a preferred long-term alternative to serve load beyond 2007, the reliability and economic aspects of the Trans Bay Cable are currently being evaluated against other transmission alternatives which could be built by PG&E (DeShazo 2005). As stated in the SF Action Plan, "at this time, the proposed DC Cable is an alternative to augment long-term load serving capability for the San Francisco Peninsula area. In deciding on a preferred long-term alternative to serve load beyond 2007, the reliability and economic aspects of the proposed project will be considered and compared to

PG&E reinforcing the existing transmission system or building a new 230 kV line to increase power imported into the San Francisco Peninsula” (Edwards 2004a).

The environmental review process and the preparation of an Environmental Impact Report for the Trans Bay Cable Project are scheduled to occur in 2005-2006.

While the Trans Bay Cable Project is an “alternative” means of satisfying load demands on the San Francisco peninsula and it is thus included as an alternative in this Staff Assessment, it would fail to meet the critical project objective of satisfying the CA ISO reliability criteria such that it would allow the shutdown of older, existing generation at Hunters Point and Potrero Power Plants. It would thus fail to feasibility attain the key project objective, which would allow for the closure of existing, higher-polluting generation in the City (Cal. Code Regs., tit. 14 §15126.6). As a result of continued operation of those older facilities, it would not in an overall sense “substantially lessen the significant adverse impacts of the proposed project on the environment” (Cal. Code Regs., tit. 20, §1765).

Alternative Description

The Trans Bay Cable Project is a high voltage direct current (HVDC) transmission line that is being proposed by Trans Bay Cable LLC, an affiliate of Babcock & Brown, a Sydney, Australia-based Company with its major overseas office based in San Francisco, in cooperation with the City of Pittsburg and Pittsburg Power Company, a municipal utility. Siemens Transmission and Distribution Company, using Pirelli cable and installation technology, will provide converter technology and construction management. The City of Pittsburg will serve as the lead agency for the purposes of CEQA review and compliance. The Project would transmit electrical power and provide a dedicated connection between the East Bay and the electrical system in San Francisco.

The Trans Bay Cable Project is presently configured to extend from PG&E’s Pittsburg Substation near Pittsburg, California to PG&E’s Potrero Substation in San Francisco. At each end of the HVDC transmission line, a converter station will be installed to convert the power from system alternating current (AC) to or from direct current (DC) (Babcock & Brown 2004).

The Pittsburg converter station would be located at 1301 Standard Oil Avenue. The site is zoned General Industrial (IG) and it is currently used as an auto storage yard with two abandoned water storage tanks (approximately 4,000 square feet combined) on the site. The Pittsburg location was chosen for the origination of Trans Bay Cable project in part because of the large amount of available generation in the area. In Contra Costa County there are 26 operational thermal power plants 100 kW or larger (listed in **ALTERNATIVES Table 4**) with total online output of approximately 4,365 MW into the regional grid (though not all of this generation would be transmitted via the Trans Bay Cable). In addition, an additional 530-MW plant (Mirant’s Contra Costa Unit 8) was approved by the Energy Commission in May 2001, but has not yet been constructed.

ALTERNATIVES Table 4 Operational Power Plants in Contra Costa County

Plant Name/Unit #	Capacity (MW)	Plant Name/Unit #	Capacity (MW)
Pittsburg #5, #6 and #7	1,332	Tosco SFAR Carbon	27
Delta Energy Center	861	Wilbur East Pet Coke Power Plant	19
Contra Costa #6 and #7	672	Wilbur West Pet Coke Power Plant	19
Los Medanos Energy Center	555	Loveridge Rd Pet Coke Power Plant	19
Crockett Cogen	247	E. Third Street Pet Coke Power Plant	19
Richmond Cogen	125	Nichols Road Pet Coke Power Plant	19
Foster-Wheeler Martinez Cogen	113	C & H Sugar #1, #2, #3	10
Martinez Refining Co.	99	Rhone-Poulenc-Stauffer Chem.	4
Calpine Pittsburg	74	Chevron – Concord	3
San Francisco Refinery	50	Nove WTE Power Plant	3
Riverview Energy Center	47	Brookside Hospital	1
Mobile GT #1, #2, and #3	45	City of Concord	0.1

Source: Energy Commission Energy Facilities Status at <http://www.energy.ca.gov/database/index.html#powerplants>

At the San Francisco end, a second converter station would be installed to convert the electrical power from DC back to system AC. The applicant is exploring various site options for the San Francisco converter station and has not yet selected a preferred site. However, in this analysis, the HWC Property, located east of Illinois Street between 23rd and 24th Streets, is assumed. The analysis presented herein would need to be modified based on the final site selection.

The Trans Bay Cable Project would include installation of approximately 59 miles of HVDC sub-sea cable in the bottom of San Francisco Bay from a Converter Station to be constructed in the City of Pittsburg in Contra Costa County to a Converter Station to be constructed in the City of San Francisco on near Potrero Point.

The primary goal of the Trans Bay Cable Project is to deliver generator-like electricity to San Francisco to meet demand projected for the period 2011 and beyond. The project is anticipated to meet the CA ISO planning and reliability standards and would decrease transmission grid congestion in the East Bay, reduce transmission losses, increase the overall security and reliability of the electrical system, and provide potential savings to ratepayers. The Trans Bay Cable Project would consist of the following major components:

- Approximately 59 miles of sub-sea HVDC cable transmitting up to 400 MW of electrical power utilizing 400 kV DC from Pittsburg to San Francisco.

- Proposed 7.5-acre Converter Station site in Pittsburg (AC/DC).
- Proposed 6.1-acres Converter Station site in San Francisco, (DC/AC).
- Short segments of AC interties between the proposed Converter Stations and the existing electrical substations (i.e., PG&E's 230 kV Pittsburg Substation in East Bay and the PG&E's Potrero 115 kV substation in San Francisco).
- Connections to the existing PG&E Pittsburg and Potrero substations.

The project is scheduled to take approximately 27 months to engineer, manufacture, construct, start up, test and bring into commercial operation. Project approvals, permitting and development activities are scheduled to be complete by the summer of 2006. Following permit approvals, detailed engineering and construction activities would begin. Based on this current schedule, the Trans Bay Cable Project would be ready for commercial operation in late 2008.

See **ALTERNATIVES Figure 7** for the proposed cable route and Converter Station locations. See **ALTERNATIVES Figures 8 and 9** for preliminary diagrams of the proposed Converter Station locations and related facilities in Pittsburg and San Francisco, respectively. The proposed cable route is anticipated to cross several sub-sea pipelines and utility cables. The project will be designed to minimize any potential impacts to these existing facilities.

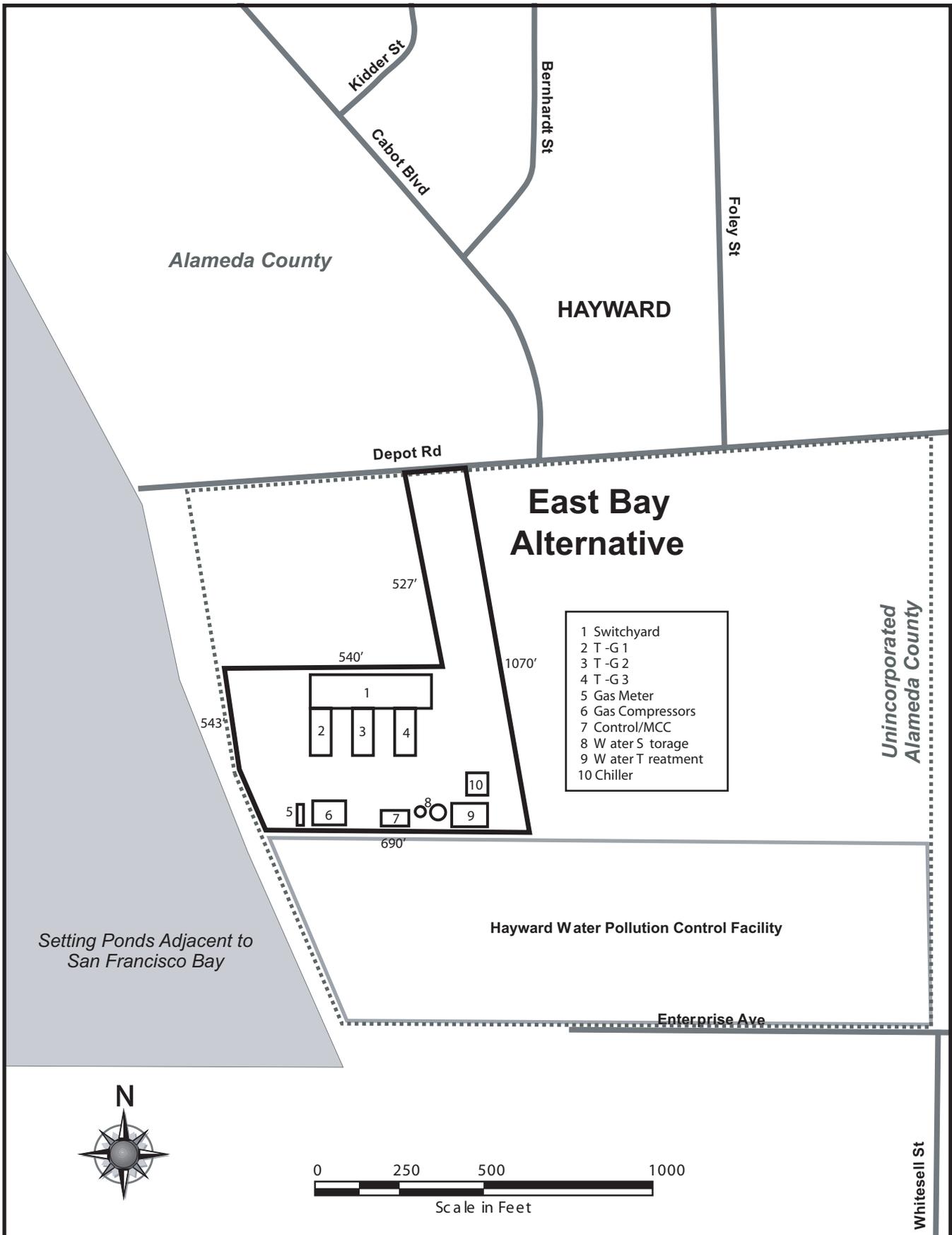
Pittsburg Converter Station. The preferred location for the Converter Station in Pittsburg is at 1301 Standard Oil Avenue (APN 073-023-07), on a lot of approximately 7.5 acres in size (see **ALTERNATIVES Figure 8**). The zoning is IG (General Industrial), and the current land use is as an auto storage yard. There are currently two existing, but abandoned, water storage tanks on the site, but no other structures. The Station will consist of an approximately 60-foot-high DC valve hall, and control building enclosure. This enclosure will occupy approximately 47,000 square feet. The balance of the site is open and will be occupied by AC and DC bus work, AC filters, a closed loop cooling system, and transformers. The site will be surrounded by an architecturally-appropriate wall or chain-link fence. The site is located within the City of Pittsburg limits and is currently occupied by an automotive recycling facility and other small businesses. The AC intertie will consist of a 3 phase, 230 kV transmission line of about 4.5 miles.

San Francisco Converter Station. The applicant is exploring various site options for the San Francisco converter station and has not yet selected a preferred site. However, the analysis presented herein assumes that the Converter Station in San Francisco would be located on the HWC Property, which is east of Illinois Street between 23rd and 24th Streets (see **ALTERNATIVES Figure 9**), south of the existing Potrero Power Plant and substation and north of the proposed SFERP. The portion of the site to be utilized will be approximately 6.1 acres in size and will consist of an approximately 60-foot-high DC valve hall, and control building enclosure. This enclosure will occupy approximately 47,000 square feet. The balance of the site will contain AC and DC bus work, AC filters, a closed loop cooling system, and transformers. The AC transmission line will connect

the converter station to the Potrero Substation at 115 kV; the 115 kV line between the two facilities would be installed within 23rd and Humboldt Streets, as well as private roadway within Mirant's Potrero Power Plant property. The converter station in San Francisco would be designed to blend in with the surrounding environment and minimize visual impacts, as practical. (refer to **ALTERNATIVES Figure 9**).

ALTERNATIVES - FIGURE 7

San Francisco Electric Reliability Project Supplement A - East Bay Alternative Site Layout

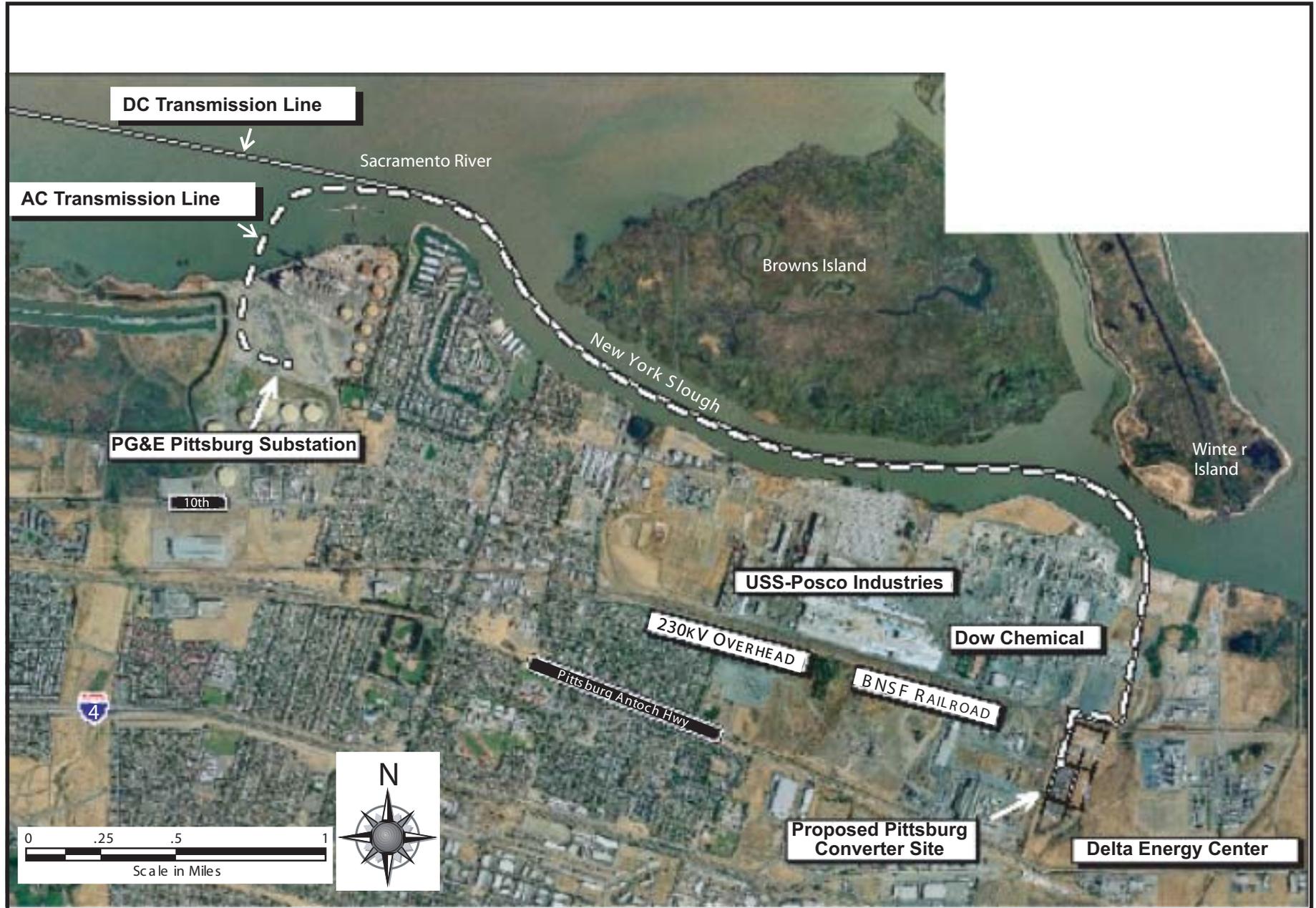


CALIFORNIA ENERGY COMMISSION, SYSTEMS ASSESSMENT & FACILITIES SITING DIVISION, FEBRUARY 2006
 SOURCE: Aspen Environmental Group

ALTERNATIVES - FIGURE 8

San Francisco Electric Reliability Project Supplement A - Pittsburg Converter Station and Substation Connection

FEBRUARY 2006

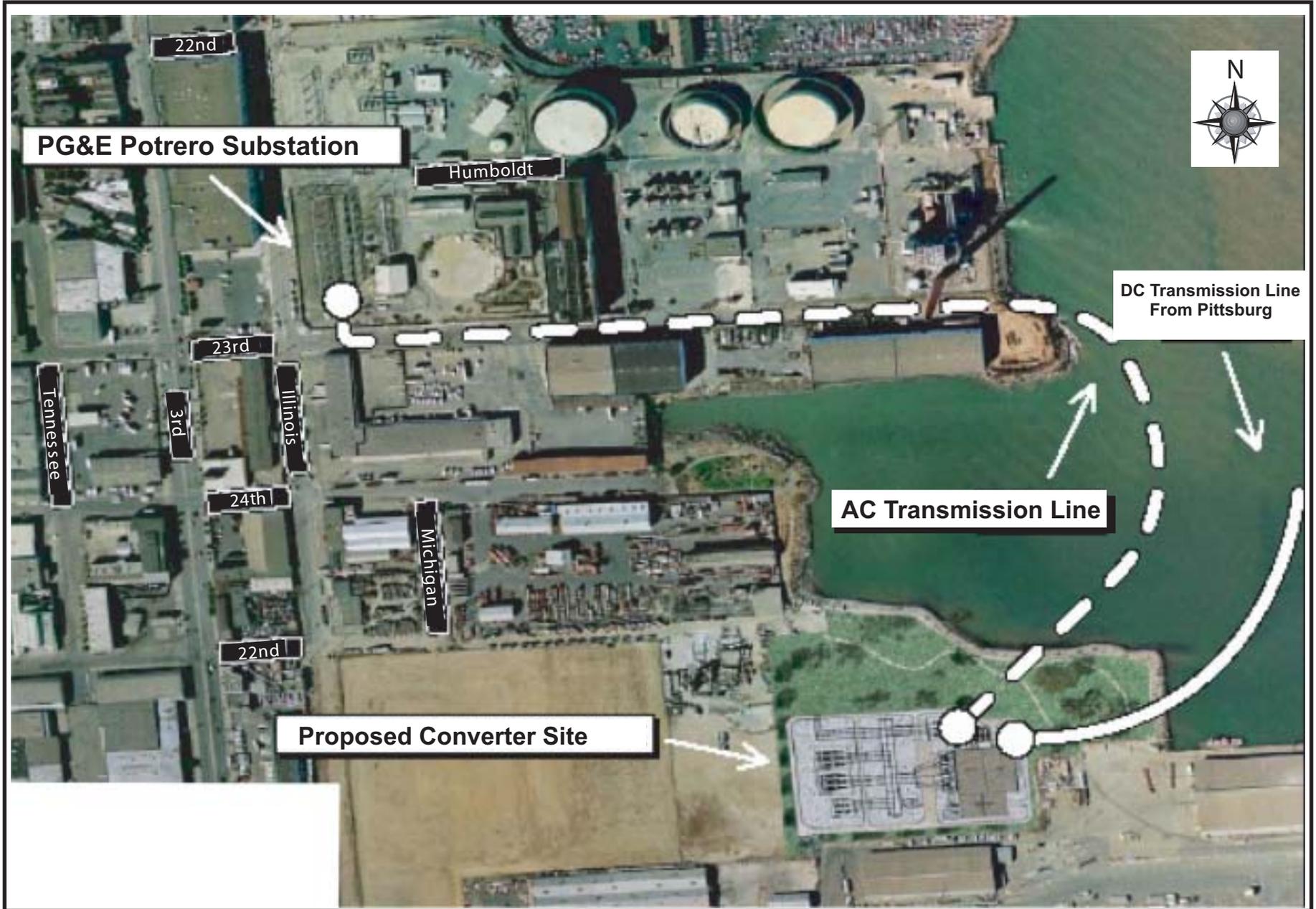


ALTERNATIVES

ALTERNATIVES - FIGURE 9

San Francisco Electric Reliability Project Supplement A - San Francisco Converter Station and Substation Connection

FEBRUARY 2006



ALTERNATIVES

Technology Utilized by the Project

The Trans Bay Cable Project would use both High Voltage Direct Current (HVDC) and High Voltage Alternative Current technologies. HVDC cable would be used for the entire underwater cable segment between Pittsburg and San Francisco. However, HVAC cables would be used to connect each converter station with PG&E substations.

HVDC technology is available from several manufacturers and has been installed in a growing list of projects around the world. For this project, the proponent believes that HVDC technology has several distinct advantages over High Voltage Alternating Current (HVAC) technology. It is controllable in a manner that mimics generation on the power delivery end and functions somewhat independently of problems in the AC grid. It has negligible magnetic fields and can be more easily and inexpensively buried underground or underwater. HVDC becomes cost effective when transmission efficiency and reduced cable cost, over longer distances, offset the power losses and costs for the HVAC to HVDC conversion stations.

Technology of High Voltage DC Power Transmission

HVDC electric power is transmitted by providing a constant voltage to one end of a transmission line. The current in the line is variable and adjusts itself to respond to the load on the other end of the transmission line. HVDC transmission is controllable in a manner that mimics generation on the power delivery end and is able to function independently of problems in the AC grid. Electric power is transmitted at high voltage to minimize losses and allow use of smaller conductors. For a given conductor size, HVDC systems are able to transmit more power with less transmission loss than are HVAC systems.

Most electric power systems are standardized such that power is generated, transmitted, distributed and utilized as AC power. An HVDC transmission system, such as the proposed Trans Bay Cable Project, must therefore have a converter station to convert HVAC power to HVDC power at the supply end of the transmission system and another station to convert power back to HVAC at the delivery end. A significant advantage of HVDC is that HVDC transmissions lines longer than approximately 25 miles can become more cost efficient than HVAC transmission lines. At these distances, the proponent states that the efficiency of the HVDC system more than exceeds the cost and efficiency associated with the converter stations.

Technology of High Voltage AC Power Transmission

Most electric power transmission and distribution systems are designed to deliver AC power to industrial, commercial and residential customers at voltages required by these users. For AC power, voltage and current vary cyclically at a frequency of 60 Hz by rotating AC generators (1 Hertz = 1 cycle per second). AC power is typically generated in three alternating phases, each of which is converted to transmission voltage and delivered via a separate transmission conductor.

Electric and magnetic fields (EMF) generated by HVAC transmission systems can be problematic. HVDC lines generate a static magnetic field similar to the geomagnetic field of the earth. Unlike HVAC lines, the magnetic field for HVDC lines is not fluctuating

due to the line frequency. Therefore, a magnetic field from a HVDC line will not induce currents in other wires or objects like a HVAC field will. As a result, aboveground HVAC transmission systems require wide, tall towers to provide adequate separation between phases and adequate separation of electric and magnetic fields from the ground, obstacles, vegetation, people and animals. When buried, on land or underwater, HVAC systems require three highly insulated cables. These cables are generally bundled or laid close together so that magnetic fields are reduced as much as possible. However, without very special and expensive configurations and construction techniques, buried HVAC cables are not suitable for transmission of power over long distances, such as is proposed for the HVDC Trans Bay Cable Project.

Description of HVDC Cable

The proposed Trans Bay Cable Project selected Siemens and Pirelli, one of several available manufacturers of HVDC transmission systems designed for underground or buried submarine installation. The HVDC system utilizes the Siemens converter station technology and the Pirelli cable design and installation technology.

The construction of the cables is made up of numerous layers of electrical insulation and other materials that ensure that the cable surface voltage remains at zero, protect the cable against water infiltration, and provide physical protection against breakage of the cable. The cable(s) will be shipped from the manufacturing site to the installation site in coils of appropriate size for the selected installation equipment and methods.

Submarine Cable Installation

With the preferred routing, the HVDC cable will be buried underwater in Honker Bay, Suisun Bay, the Carquinez Strait, San Pablo Bay, and San Francisco Bay. The cable installation will use a specialized cable laying ship and/or barge and specialized equipment to bury the cable. Cable burial depths will nominally be 3 to 6 feet deep in areas of the Bay containing soft sediments. Depths are expected to vary in response to the geophysical make up of the bay floor sediments. Where possible, the cable route selected will avoid shipping channels, anchorages, dredge disposal areas and all other known obstacles. In areas where the cable route crosses shipping channels, the cable will be buried below the maximum dredging depth in accordance with the U.S. Army Corps of Engineers maintenance dredging program.

The cable will be coiled in one or more lengths that will fit on the specially designed cable laying ship and/or barge. It is expected that the cable can be laid in two lengths, of approximately 25 miles each, requiring only a single splice in the underwater section. However, it may be necessary to have more splices if it is necessary to go under (instead of over) existing utility lines (e.g., pipelines and cables) in the Bay. The cable will normally be buried in the floor of the Bay using a jet plow and/or a water-jet trenching machine. Where the cable must be installed at a greater depth (e.g., where it crosses a dredged shipping channel), it may be necessary to utilize a standard clamshell dredge. Where appropriate, the cable will be protected using concrete mattresses, cast iron shells, and/or plastic/rubber sleeves. It is expected that the underwater section of the Trans Bay Cable can be installed in less than 30 working days.

Land-Based Cable Installation

It is expected that a land-based cable installation will require a somewhat different cable specification than a submarine installation. A second cable specification may be required to suit the thermal properties of the underground locations. It is currently anticipated that directional drilling will be utilized where the submarine cable transitions to land. This eliminates the need to trench in shallow water and across the tidal zone in potentially sensitive biological habitat. It is also currently anticipated that the cable will be installed on land via typical cut-and-cover trenching and burial techniques to a depth of approximately 3 feet.

Permits Required

The Trans Bay Cable would have to acquire a variety of permits for its onshore and offshore components. Permitting agencies and jurisdictions would include the following: City of Pittsburg, CCSF, City of San Rafael, California State Lands Commission (CSLC), Bay Conservation and Development Commission (BCDC), U.S. Army Corps of Engineers (USACE), U.S. Coast Guard, California Coastal Commission (CCC), Regional Water Quality Control Board (RWQCB), and National Oceanic and Atmospheric Administration (NOAA).

The major permits for the offshore portion are those required for compliance with the Clean Water Act and the McAteer-Petris Act. Those two permits are described in this section.

Clean Water Act Permitting – U.S. Army Corps of Engineers. Clean Water Act Section 10 and 404 permits from the U.S. Army Corps of Engineers (USACE) would be required in order to lay marine cable across the San Francisco Bay. Nationwide Permit 12 under the Clean Water Act for standard utility line activity could also apply if general conditions are met. This USACE permit would be simpler than receiving the individual Section 10 and 404 permits. While there are several potential environmental and design concerns regarding the permitting, the USACE has stated that a bay crossing would be feasible according to its regulations (USACE 2003). The biggest concerns are the potential for impedance of navigation and/or dredging and the potential impacts to sensitive eelgrass habitat at the bay margins. The Port of Oakland is in the process of analyzing its future operation, which may involve allowing shipments from Pacific Rim ships, which have a deeper draft than the present ships. This allowance would involve deeper (minimum of 50 feet) and/or more frequent dredging of the federally maintained shipping channel beneath the Bay Bridge. A transmission cable would have to be deep enough not to affect this dredging.

McAteer-Petris Act Permitting – Bay Conservation and Development Commission (BCDC). An electric cable installed across the San Francisco Bay would require a permit from the BCDC. Because the proposed SFERP Project is a feasible upland alternative that would avoid a bay crossing, there are regulatory feasibility constraints associated with the BCDC under the McAteer-Petris Act and the *San Francisco Bay Plan* that greatly question the ability to acquire project approval in a reasonable period of time (BCDC 2003).

The BCDC's findings and declarations for this alternative would be based on the McAteer-Petris Act, the *San Francisco Bay Plan* (Bay Plan), their federally approved management plan for the San Francisco Bay, and the federal Coastal Zone Management Act (CZMA). According to the McAteer-Petris Act, installation of a submarine cable would be considered as "fill" within the Bay. Section 66605 of that Act mentioned above states that the BCDC cannot approve a project that requires bay fill unless there are no feasible upland alternatives. While the BCDC can override this provision if a project has public benefit that is found to outweigh the impacts of the project, the BCDC has recently been unwilling to approve overrides in similar situations (e.g., Potrero Power Plant Unit 4) (BCDC 2001).

Section 66602 of the McAteer-Petris Act states, in part, that: ". . . existing public access to the shoreline and waters of the San Francisco Bay is inadequate and that maximum feasible public access, consistent with a Proposed Project, should be provided." Section 66632 states, in part, that "[w]hen considering whether a project provides maximum feasible public access in areas of sensitive habitat, including tidal marshlands and mudflats, the Commission shall, after consultation with the Department of Fish and Game, and using the best available scientific evidence, determine whether the access is compatible with wildlife protection in the Bay." The *San Francisco Bay Plan* policies on public access further state that ". . . maximum feasible public access should be provided in and through every new development in the Bay or on the shoreline . . . the access should be permanently guaranteed . . . should be consistent with the physical environment . . . provide for the public's safety and convenience . . . and be built to encourage diverse Bay related activities and movement to and along the shoreline."

The *Bay Plan* policies on Appearance, Design, and Scenic Views state that, "[t]o enhance the visual quality of development around the Bay and to take maximum advantage of the attractive setting it provides, the shores of the Bay should be developed in accordance with the Public Access Design Guidelines All bayfront development should be designed to enhance the pleasure of the user or viewer of the Bay and maximum efforts should be made to provide, enhance, or preserve views of the Bay and shoreline, especially from public areas, from the Bay itself, and from the opposite shore" (Policies 1 and 2).

Finally, Section 66605(a) and (d) of the McAteer-Petris Act, cited above, provides the Commission authority to require mitigation for loss of surface water area and water volume and other adverse impacts to the Bay bottom habitat. The *Bay Plan* policies on mitigation state, in part, that "[m]itigation should consist of measures to compensate for the adverse impacts of the fill to the natural resources of the Bay . . . [and should provide] area and enhancement resulting in characteristics and values similar to . . . [those] . . . adversely affected . . . [and should be provided] at the fill site, or if the Commission determines that on-site mitigation is not feasible, as close as possible . . . and provided concurrently with those parts of the project causing adverse impacts" Assuming BCDC would permit the project, the BCDC noted that a project such as installation of a submarine cable would require that CCSF provide mitigation for Bay impacts.

Environmental Assessment for Trans Bay Cable Alternative

The City of Pittsburg, as CEQA Lead Agency for consideration of the Trans Bay Cable Project, issued a Notice of Preparation of an Environmental Impact Report (EIR) in late August 2004. A complete EIR will be prepared to evaluate the Trans Bay Cable Project, as well as alternatives to that project. However, because that EIR was not available at the time that this Staff Assessment was prepared, Energy Commission staff prepared the summary analysis presented in the following paragraphs.

Air Quality

This alternative would cause short-term emissions from site preparation and cable installation during construction. Heavy-duty off-road construction equipment, similar to that needed for SFERP construction, would be used to develop the two converter stations and connections to the existing substations. Similar to the construction of SFERP, Energy Commission mitigation would be necessary to avoid significant air quality impacts, especially from dust that would potentially affect sensitive land uses near the converter stations.

Specialized marine vessels would be used to install the cable in the bay. Power for the marine vessels, including propulsion, plowing, hydraulic systems, and other mechanical systems, would likely come from diesel-powered engines and generator systems on board the vessels. Dredging equipment, if needed, would also be diesel-powered. The marine vessels and generator systems would be large sources of nitrogen oxides, diesel particulate matter, and other contaminants of combustion. These emissions would be similar to those of the heavy-duty off-road equipment used on land, and as with all construction phase emissions, marine vessel emissions would be short-term. The impacts associated with installation of the Trans Bay Cable Alternative would therefore be similar in nature to those of the SFERP, and Energy Commission mitigation could be necessary for ensuring that marine vessel emissions would be minimized.

After construction, the cable would be energized with power provided to the Pittsburg Substation by a number of existing power plants (see **ALTERNATIVES Table 4**, above). Power generated for the cable would cause emissions from a variety of existing and possibly new power plants. Although it would be impossible to identify which power plants would energize the cable, the emissions from each plant would not be beyond those allowed by approvals the Energy Commission licensing process or other approvals. Each plant would need to continue to comply with the air permitting requirements of the Bay Area Air Quality Management District, as they must presently comply in the existing conditions. Staff assumes that no additional generating facility would be built to energize the cable.

Although the specific power plant(s) that would energize the Trans-Bay Cable are not known, an example of a likely source of power for the cable for the purpose of this analysis would probably be Mirant's 530-MW Contra Costa Unit 8, which was approved by the Energy Commission in May 2001. Approvals for that plant allow emissions of up to 0.075 pounds of NO_x per megawatt-hour (MW-hr) (CEC 2002a). This is compared to the SFERP, which would create 0.09 lb/MW-hr (SFERP 2004a). Although there is no way to accurately predict which generating facilities would provide power to the cable (this depends on market conditions and CA ISO dispatch), importing power from Contra

Costa County could lead to reduced use of the existing Potrero Power Plant, thus reducing air emissions within San Francisco.

The operations at each end of the HVDC transmission line, the converter stations, and activities at the Pittsburg and Potrero Substations would not be likely to produce measurable emissions. Because no new generating facilities would be built under this alternative, no substantial new air quality impacts are expected to occur during long-term operation, and no locally-oriented mitigation would be necessary.

Biological Resources - Aquatic

Construction of the Trans Bay Cable alternative could have short-term and long-term impacts on the Bay ecosystem; project construction would result in immediate localized effects to the bottom life. Direct impacts could include the loss of coastal salt marsh and eelgrass beds during project construction in the shoreline zone. Indirect impacts could include localized species composition changes in the bay due to changes in predators, prey and competitors. Recolonization could take several months or years after construction is completed.

If project construction occurs in relatively polluted areas (e.g., portions of the Carquinez Strait), contaminated sediments are likely to be dispersed into the water column, resulting in localized, temporary increases in contaminant concentrations that may affect fish and invertebrates.

Although an increase in turbidity resulting from cable installation would not last for long, there could be longer-term consequences for sensitive biological resources. Increased turbidity can reduce the survival of herring eggs, which are attached to hard surfaces on the Central Coast shorelines, potentially resulting in reduced recruitment and abundance of this important Bay species. In certain locations, and during certain times of year, increased turbidity can affect the survival of larval and juvenile stages of certain sensitive fish species, as well as the feeding and migration of adults.

Turbidity could reduce visibility, causing difficulty locating prey. Suspended sediments could also clog gills. Generally, bottom dwelling fish are most tolerant of suspended solids, and filter feeding fish are the most sensitive. Bay bottom disturbance from the Trans Bay Cable installation in the Central Bay during summer months could affect the migration of protected species such as steelhead and Chinook salmon. The San Francisco Bay is an important nursery habitat for juvenile Dungeness crabs, and summer construction activity could affect this important commercial species.

In order to reduce aquatic biological resources impacts, dredging periods would be established by the National Marine Fisheries Service (NMFS) and dredging permits from the NMFS and U.S. Army Corps of Engineers would be required, which would include safeguards and mitigation for aquatic biota. Regardless, due to these biological resource concerns, staff believes that the impacts associated with installation of the Trans Bay Cable would be far greater and more damaging to Bay species and their habitats than the proposed project.

Biological Resources - Terrestrial

Construction of landing sites and converter stations could affect state and federal listed species and their habitats such as coastal salt marsh and eelgrass beds located near the shoreline. Since the proposed project will not have any such effects, the Trans Bay Cable alternative is likely to have far greater terrestrial biological resource impacts than the proposed project. However, if the Trans Bay Cable alternative project were implemented, it would not have any NOx emission concerns for biological resources unlike the proposed project and the other alternatives.

Cultural Resources

Record searches (California Historical Resource Information System and State Lands Commission) and detailed surveys (terrestrial and underwater) for cultural resources that might be affected by the Trans Bay Cable Project alternative need to be conducted. Buildings and structures adjacent to the converter sites have not been evaluated to determine if they met the eligibility requirements for the CRHR. The shoreline environment and bay floor is sensitive for prehistoric and historic period cultural resources. Buried cultural resources may be present at the converter sites and in the vicinity of linear facilities (terrestrial and underwater). After underwater and terrestrial surveys, identified resources that could not be avoided would need to be evaluated for eligibility to the CRHR. If resources are found to meet the eligibility requirements for the CRHR, then mitigation measures would need to be developed to reduce the impacts to less than significant, if possible. Compared to the SFERP site, developing the Trans Bay Cable Project may have the potential to have more of an impact on cultural and historical resources due to the greater ground disturbance required from the DC and AC lines and converter station construction.

To avoid impacts potentially caused by disturbing buried cultural and historical resources from the construction of the Trans Bay Cable Project, mitigation requiring oversight of a cultural resources specialist would likely be necessary during construction.

Hazardous Materials Management

Little hazardous materials would be used in the construction of ancillary land-based facilities and none would be used along the 55-mile underwater cable route. Typical hazardous materials found in similar construction of power grid-related facilities include fuels, welding gases, and solvents. Once construction is completed, no hazardous materials would be used or stored at the converter stations. In regards to hazardous materials, therefore, this alternative would be far superior to the proposed SFERP.

Land Use

The land use analysis focuses on the project's compatibility with the existing and planned land uses, and the project's consistency with local land use plans, ordinances, and policies.

The Trans Bay Cable project would be subject to a number of environmental and regulatory reviews including a federal consistency determination and permit from the San Francisco BCDC. The project would also have to conform to all applicable

regulations and general plan goals of the City of Pittsburg, Contra Costa and Solano Counties and the CCSF.

The Pittsburg converter station would be located at 1301 Standard Oil Avenue in the City of Pittsburg. The site is zoned General Industrial (IG) and it is currently used as an auto storage yard with two abandoned water storage tanks (approximately 4,000 square feet combined) on the site. Surrounding land uses are also industrial related. Within the City of Pittsburg the AC transmission line from the converter station to New York Slough will angle its way through an industrial (IG) zoned district.

At the San Francisco end, a second converter station would be installed to convert the electrical power from DC back to system AC. The applicant is exploring various site options for the San Francisco converter station and has not yet selected a preferred site. However, assuming the Western Pacific site is selected, the site is zoned Heavy Industrial and is surrounded by industrially zoned land uses.

The transmission cable line between the two terminals would consist of one HVDC transmission cable with a separate metallic return cable and one fiber optic communication cable to be fastened in a bundle. The primary and return cables, each approximately 5 and 4 inches in diameter, respectively, would be buried underwater and routed from the Pittsburg converter station into the water at Suisun Bay (New York Slough), through the Carquinez Strait and San Francisco Bay to a landing point near the San Francisco-based converter station.

Impacts of the Converter Sites and Trans Bay Cable. Construction of the converter sites and transmission lines would require the temporary stockpiling of materials and equipment either within the project site or in approved areas. Any impacts to land use would be isolated and short term while construction vehicles and equipment go to and from the sites. The use of construction laydown areas along the transmission line right-of-way would also be temporary in nature and would not displace any existing use. Given the industrial nature of the neighborhoods surrounding the proposed laydown areas in Pittsburg and San Francisco, staff considers this activity compatible and would not be a significant impact.

As noted above in the alternative description, the installation of the bay cable line will be subject to a number of environmental and regulatory permits and reviews. The BCDC will require a federal consistency determination and permit, and other agencies such as the Fish and Wildlife Service, the Coast Guard and the Corp of Engineers will require regulatory permits.

Because of the recreational boating and commercial shipping activities within the Carquinez Strait, San Pablo Bay and the San Francisco Bay, there is some potential for disruption to boating and other marine uses during the installation of the cable along the bay floor. The cable installation activity would need to be scheduled to avoid the key times for commercial and recreational uses of the Bay.

Both the Western Pacific site (if selected) in San Francisco and the Pittsburg converter site are zoned industrial and surrounding land uses are primarily industrial so the

proposed uses would be compatible. The sites would not conflict with applicable land use plans, policies, or regulations of the various local planning agencies.

The proposed converter stations and transmission line installations would not cause substantial changes in land use. Any disruption to adjacent uses during construction of transmission lines in the Pittsburg and San Francisco would be temporary in nature, and will not conflict with existing land uses along the transmission corridors. Since the transmission lines would be underground and likely within paved roads, they would not disrupt or divide the physical arrangement of an established community. Also for these reasons, the transmission line would not restrict existing or future land uses along the route. Overall, the Trans Bay Cable Alternative would be greatly preferred to the proposed SFERP.

Noise

The cable and both converter stations would lie on industrially-zoned property, a significant distance from sensitive noise receptors. During construction, typical construction practices, such as employing equipment with properly operating mufflers and restricting noisy work to daytime hours, would provide adequate protection from noise impacts. During operation, the cable itself would be silent. Noise from the converter stations (i.e., cooling fans) would be barely audible outside the facility boundaries, and inaudible at any sensitive receptor. Similar to the proposed SFERP, standard design practices and compliance with LORS would ensure no significant noise impacts.

Public Health

No direct public health impacts could be identified due to this alternative. There are no emissions of TACs from this alternative unless the power supply would run a longer period of time than otherwise. In that case, the health risks from emissions from gas turbines and cooling towers are typically below the level of significance. Cumulative impacts would have to be identified and would be dependent upon the incremental increase in operating hours required to provide power to SF and the existing emissions from other sources in the area of the power plant (in this case Contra Costa County). This cumulative impact, however, would be localized and most likely insignificant given past assessments conducted by the BAAQMD and CEC staff.

An indirect impact could potentially be serious if bay mud/sediments along the 55-mile bay cable route release significant amounts of bioavailable toxics such that an increase in fish tissue levels of PAHs, PCBs, mercury, and chlorinated dioxins occurs. Persons who rely heavily on subsistence fishing for their diets and the occasional fisherperson who might be sensitive (children and pregnant woman) might be impacted. An ecological risk assessment and a human health risk assessment would have to be prepared to assess this exposure and risk to public health.

In regards to direct public health impacts, this alternative would most likely be lower than the proposed SFERP. Indirect impacts might make this project equivalent to the SFERP.

Socioeconomics

Staff has estimated the potential socioeconomic benefits from the Trans Bay Cable alternative. This analysis focuses on the Pittsburg power plant site where one of the converter stations would be built; the other would be built near the SFERP site. The benefits from construction of the converter station in Pittsburg include increases in sales taxes, employment, and income for Contra Costa and neighboring counties (see **SOCIOECONOMICS Table 2** for data and information). Staff finds that the Trans Bay Cable project would 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 Pittsburg converter station site is about 59 percent and it is 75 percent within one mile of the nearby Pittsburg Power Plant. The low-income population within six miles is 13 percent. In comparison, based on staff's demographic screening analysis for the proposed SFERP project, the minority population within six miles of the proposed power plant site at Potrero is less than 57 percent and the low-income population within six miles is slightly above 11 percent.

Staff finds that there would be no 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 and, therefore, there are no socioeconomic environmental justice issues. The Trans Bay Cable project would be consistent with the applicable socioeconomic LORS.

Traffic and Transportation

Traffic in the vicinity of the San Francisco and Pittsburg converter stations would be similar to that of the proposed SFERP. The high level of industrial activity of the surrounding uses generates a substantial level of truck traffic. Similar to the proposed project, before construction could occur for the Trans Bay Cable project, a construction traffic control and transportation demand implementation program would need to be developed in coordination with the City and County of San Francisco and Caltrans. These programs would limit construction-period truck and commute traffic to off-peak periods and avoid potential traffic and transportation impacts.

If barges and vessels used for the construction of the Trans Bay Cable project must anchor or moor in a manner other than to an existing approved dock or pier, they could create a safety hazard to shipping traffic. If the construction barges or vessels must anchor or moor for construction activity away from an approved dock or pier, then they must obtain a waiver from the U.S. Coast Guard Marine Safety Office San Francisco Bay. If this is done, then the Coast Guard will be able to inform barges and vessels operating in the area such that impacts on Bay shipping traffic would be insignificant.

Mitigation necessary to reduce the impacts of this alternative to less than significant levels would include the following: the applicant would inform and coordinate the construction activity with the U.S. Coast Guard, Water Management Branch if it must anchor or moor any barges or vessels associated with the project in any manner other than to an existing approved dock or pier. This would include a letter to the Commanding Officer of the U.S. Coast Guard Marine Safety Office San Francisco Bay,

Attention Water Management Branch, Coast Guard Island, Building 14, Alameda, California 94501-5100. This letter would include:

- A full description of the existing conditions/situation, to be followed up with a detail drawing of the area showing large and small scale coverage, in the drawing it should also show the location of equipment and resources clearly marked and spelled out and well defined.
- A statement and similar description on the work to be done and why.
- A time schedule as to when work will start (date and time), how many hours a day operations will be conducted and an estimated date and time of project completion.
- Listing of all persons involved in the operation, their title and job description (Person in Charge of operations, Operations Manager or Site Manager) and information on how to contact this person and their availability.
- A barge break-away contingency plan.
- Listing of on-site communication cellular phone numbers and radio frequencies that are monitored. (Must be VHF-FM Marine Channels 14 and 13)
- A listing of all companies, agencies and groups involved in operation.

Therefore, prior to the start of construction activity in the Bay, the project owner would have to ensure that the U.S. Coast Guard Marine Safety Office is informed about its construction activity in the Bay, and shall obtain the necessary anchorage waiver. The project owner would also have to include in the Monthly Compliance Report, copies of all correspondence with the U.S. Coast Guard and copies of anchorage waivers received for work to be conducted in the Bay.

During construction the Trans Bay Cable Project would have greater traffic impacts resulting from construction activities at converter station sites in both San Francisco and Pittsburg, linear construction of underground transmission lines in roadways, and possible impacts associated with vessel use while constructing the underwater cable. Operational impacts would be similar and both projects would be consistent with the applicable traffic and transportation LORS.

Transmission Line Safety and Nuisance

This project would involve the use of a transmission system that would be much longer and more complex than with the SFERP system in terms of physical extent, reliability, maintainability, ease of repairs, shut-down frequency, and shock and obstruction hazard to fishermen and other marine users. This alternative would increase the sources of electric and magnetic fields and potential human exposures. Given the uncertainty about the health risks from human exposure to direct-current or alternative-current fields, any risk from such field exposures would be much lower for the proposed SFERP project than for this Trans Bay alternative. As a result, the Trans Bay Cable would be less preferable than the proposed SFERP in terms of Transmission Line Safety and Nuisance related to electric and magnetic fields.

Visual Resources

San Francisco Converter Station. The proposed AC-DC Converter Station site is located within San Francisco's eastern industrial waterfront area, near the India Basin Industrial Park. The San Francisco Municipal Railway has proposed the construction of their new Metro East Light Rail Maintenance and Operations Facility north of the site. A proposed main shop and administration building for the facility will be about 40 feet tall and 180,000 square feet.

The AC-DC Converter Station's most prominent visual features include a DC Hall, a Control Building and a switchyard. The 30-to-40-foot-tall DC Hall would be the tallest structure on the site. The DC Hall's height would be consistent with surrounding industrial buildings, which are 45 feet or less in height. The horizontal block forms and straight lines of the DC Hall's features would appear similar to the form of existing surrounding buildings, and smaller in scale when visually compared to existing structures at the Port of San Francisco North Container Terminal, the Potrero Power Plant and the expanse of San Francisco Bay. The site is partially screened by existing structures. The gray or silver color of the switchyard may contrast moderately with existing structures and the blue hue of the Bay.

Numerous residences at elevated locations on Potrero Hill may have a view of the Converter Station. While residents generally anticipate open, frontal views of a highly urbanized, industrial waterfront landscape, any new industrial features in the view of the Bay would be perceived as detracting from the more scenic elements of the view.

Mitigation would be required to minimize the visual effects of light and glare by such methods as shielding lights, surface treatments and screening in accordance with the CCSF's requirements. Also, BCDC visual policies may be applicable to the proposed Converter Station at this location.

Under the present circumstances, the Converter Station would appear to increase the structural density and limit views of the Bay. However, in the context of the existing complex industrial character surrounding this site and the appearance of various industrial structures and equipment, the Converter Station would not cause an adverse visual change or a significant visual impact. The Converter Station would visually relate to its immediate setting. The Converter Station would not result in a high degree of visual contrast or view blockage and would not be a dominant structure in the landscape.

Pittsburg Converter Site. The proposed AC-DC Converter Station would be located in the City of Pittsburg in a heavy industrial area. Major industrial facilities in the area include the DOW Chemical manufacturing facility and the USS-POSCO steel fabrication plant to the north, and the Delta Energy Center to the east. Also in the area, there are several small cogeneration plants. Power transmission lines, scattered exhaust stacks of industrial facilities, and several water towers are some of the larger, vertical features that are noticeable in the landscape. Steam plumes from a number of the industrial facilities in the region are regularly visible under certain meteorological conditions.

Viewer concern and exposure from Interstate Highway 4 is moderate to high and low to moderate from the Pittsburg-Antioch Highway. Both highways are south of the alternative project site. Views to the north from Highway 4 would include, in addition to the alternative site (undeveloped property), industrial facilities and power transmission lines which currently obstruct views towards New York Slough approximately $\frac{3}{4}$ of a mile away. Because of the mixed land use patterns visual quality is generally moderate to low.

Because open space areas and corridors with unobstructed views to the water and nearby hills are scarce in much of the region, these areas and corridors have been recognized as sensitive and important to protect by the City of Pittsburg. The City of Antioch, immediately east of the alternative project has identified the importance of preserving views of the river, distant hills, and local ridgelines and maintaining visual edges and gateways to maintain and enhance its community image. Contra Costa County has recognized that its scenic vistas, especially views of ridges, hillsides, and the Delta area, are major contributors to the perception that the county is a desirable place to live and work and preserving the quality of visually sensitive features of the landscape would help preserve and reinforce the county's landscape character and balance the effects of development (Contra Costa County 1991 General Plan).

In the context of the existing complex industrial character surrounding the site and the appearance of various industrial structures and equipment, this Converter Station alternative would not cause an adverse visual change or a significant visual impact. The Converter Station would visually relate to its immediate setting. The Converter Station would not result in a high degree of visual contrast or view blockage and would not be a dominant structure in the landscape.

As proposed, neither the SFERP nor the Trans-Bay Cable alternative would introduce a significant visual impact into their respective existing settings.

Waste Management

Little solid waste would be generated during the construction of ancillary land-based facilities or along the 55-mile underwater cable route. Typical solid and hazardous wastes generated in similar construction of power grid-related facilities include waste oil, paints, solvents, trash, and construction debris. Nonhazardous solid waste would be disposed of according to LORS. Because the 55-mile bay cable would be placed under bay mud and sediments, some of these sediments may be brought to the surface and collected. If so, these sediments would have to be tested and if determined to be hazardous, disposed of appropriately. Construction of land-based converter stations and perhaps expanded substations and the placing of land cables between these facilities might require the preparation of Phase 1 Environmental Site Assessments (ESAs) and perhaps Phase 2 ESAs. The results of these ESAs will determine the need for any site characterization and site remediation. Once construction is completed, no hazardous waste would be generated at the converter stations. Therefore, in regards to solid and hazardous wastes, this alternative would be either the same or a little better than the proposed SFERP.

Water and Soils

This option will create a significant water quality impact in the Bay. The suspended sediments will require mitigation. There are several permits, which must be obtained before the cable can be placed in the Bay. The construction of the converter stations will also have impacts, which will be similar to the impacts of the SFERP and the East Bay alternative. The permits will have to be obtained for each side of the bay.

Contaminated soils, bay sediments or groundwater could be encountered at the either converter station or in the Bay because of previous activities that may have resulted in chemical spills. Site assessment and remediation may be necessary prior to construction, which would involve participation of the San Francisco Bay Regional Water Quality Control Board, and possibly the City of Pittsburg Fire Department. During construction and site preparation, if contamination is encountered, mitigation measures consisting of proper testing, treatment, and disposal would be necessary.

Plans for grading and erosion control, dewatering, and storm water pollution prevention would also need to be reviewed by local agencies, including the San Francisco Bay Regional Water Quality Control Board, the San Francisco Public Utilities Commission Bureau of Environmental Regulation and Management, the City of Pittsburg Public Works Department, Contra Costa County Public Works Agency, and the State Water Resources Control Board. These plans, procedures, and measures would be similar to those necessary for development of SFERP.

The Trans Bay Cable Project would be the least favorable option from a water quality standpoint.

Worker Safety and Fire Protection

Worker safety would be protected by adherence to LORS, which include Cal-OSHA regulations. Special attention should be paid to worker safety in marine environments during cable-laying. Fire protection would also be assured by following LORS including the California Fire Code. The converter stations might need to be equipped with automatic fire suppression systems due to the presence of flammable mineral oil in transformers. It is doubtful that the presence of converter stations or expanded substations would place a significant burden on the existing fire or EMS response infrastructure. Therefore, this alternative would have a smaller impact in the areas of worker safety and fire protection than the proposed SFERP.

Engineering Assessment for Trans Bay Cable Alternative

Facility Design

The design and construction of the project shall be in compliance with applicable engineering laws, ordinances, regulations and standards.

Geology and Paleontology

Since the cable will be 4 to 5 inches in diameter and buried approximately 3 to 6 feet deep along the sea floor, except where existing cables will be crossed resulting in possibly deeper installation, unconsolidated marine deposits of varying thickness will

underlie the majority of the alignment. The proposed cable will also cross near the Hayward Fault. The Western Pacific alternate site is underlain by artificial fill and at depth by younger bay mud. The Pittsburg terminus is underlain by unconsolidated marine deposits. As a result, strong seismic ground shaking, liquefaction, and possibly fault rupture represent the main geologic constraints for this alternate. Adequate design parameters for the facility would need to be determined through a site-specific evaluation by a Certified Engineering Geologist and/or Geotechnical Engineer.

Impacts due to seismic hazards would need to be mitigated by complying with the requirements and design standards of the California Building Code. Impacts to geologic resources would not be expected. Mitigation of potential impacts to paleontological resources could be accomplished by construction monitoring by a paleontological resources specialist and salvaging of any identified fossils. These impacts and the measures for mitigation would be similar to those of the proposed project.

Power Plant Efficiency

The Trans Bay Cable alternative does not impact Power Plant Efficiency.

Power Plant Reliability

The Trans Bay Cable alternative does not impact Power Plant Reliability.

Transmission System Engineering

While the CA ISO does not consider the Trans Bay Cable to be an alternative to SFRP, it is being considered by the CA ISO as a way to augment the long-term load serving capability for the San Francisco Peninsula Area (DeShazo 2005). In deciding on a preferred long-term alternative to serve load beyond 2007, the reliability and economic aspects of the Trans Bay Cable are currently being evaluated against other transmission alternatives which could be built by PG&E (DeShazo 2005). Construction of this alternative would avoid any adverse effects to the San Mateo-Martin corridor and at the Martin Substation that could be caused by the Brisbane or SFIA alternative.

Compared to repair of an overhead line or repair of a thermal power plant, repair of an undersea underground line would take much more time. Special techniques must be used to locate the problem and very sophisticated techniques to repair the damage. Unless imports to the Peninsula and local generation were sufficient, power outages could occur. The converter stations are also more susceptible to earthquake damage than power plants, which could result in significant loss of power for the Peninsula. Special design requirements may need to be incorporated to assure reliability of the Peninsula.

NO PROJECT ALTERNATIVE

CEQA requires an evaluation of the No Project Alternative in order that decision makers can compare the impacts of approving the project with what would likely occur if the project were not approved. According to CEQA Guidelines [Section 15126.6(e)], the No Project Alternative must include (a) the assumption that conditions at the time of the Notice of Preparation (i.e., baseline environmental conditions) would not be changed

because the proposed project would not be installed, and (b) the events or actions that would be reasonably expected to occur in the foreseeable future if the project were not approved. The first condition is described in this Staff Assessment for each environmental discipline as the “environmental baseline,” since no impacts of the proposed project would be created. This section defines the second condition: reasonably foreseeable actions or events and the impacts of these actions.

In this case there is an overlap between the No Project Alternative and alternatives to the proposed project. In this case both the Trans Bay Cable and the Potrero Unit 7 Project are considered in both sections because (a) they meet the project objectives so are legitimate alternatives, and (b) they may occur if the SFERP is not constructed.

The No Project Alternative scenario is based primarily on a series of communications from the CA ISO to CCSF (see Appendix C). Based on these letters and consideration of the Bay Area’s electrical situation, the components of the No Project Alternative are assumed to be the following (each component is described in more detail below):

1. **Potrero Power Plant Unit 7 would be installed.** The Potrero Power Plant Unit 7 project application could be reinstated and the project could move forward.
2. **Trans Bay Cable Project would be installed.** Construction of the Trans Bay Cable Project, a 600 MW DC cable from Pittsburg to CCSF, would occur.
3. Hunters Point Power Plant Unit 4 would be closed.
4. **PG&E system upgrades and improvements would occur.** Re-rating and upgrading of certain transmission lines, and installation of a new transformer would improve system reliability and service. The conversion of San Mateo-Martin #4 from 60 kV to 115 kV is now completed, but it is assumed that the Potrero-Hunters Point 115 kV underground cable and the Jefferson-Martin 230 kV Transmission Line Project would be constructed before the end of 2006.
5. **System management and planning would continue to occur.** PG&E and the CA ISO would continue to implement an Interruptible Load Program (allowing the selective load dropping during peak load periods), demand-side management would be encouraged, and curtailment of electric service would be required in the worst-case demand growth scenarios.
6. **Increased utilization of Special Protection Schemes (SPS) –** PG&E and CA ISO are evaluating the implementation of an SPS in CCSF. Though important to pursue regardless of the outcome of the Proposed Project, continued and increased reliance on SPS in CCSF would be insufficient to provide compliance with reliability criteria. Nonetheless, if no other alternative is pursued, at a minimum continued and increased use of SPS in CCSF would be required to provide for controlled involuntary load curtailment during “high load” operating conditions.
7. **Demand-side management would occur.** Energy conservation programs in place by the Energy Commission, CPUC, CCSF, and PG&E would continue to be implemented.
8. **Interruptible load program would be implemented.** This type of demand-side management program could be implemented, which in accordance with contractual arrangements, can interrupt consumer load at times of seasonal peak load by direct

control of the utility system operator or by action of the consumer at the direct request of the system operator. This type of control usually involves commercial and industrial consumers.

9. **Curtailment of electric service could occur.** Consumer load would be interrupted at the time of annual peak load by direct control of the utility system operator by interrupting power supply to individual appliances or equipment on consumer premises. This type of control usually involves residential consumers.

POTRERO POWER PLANT UNIT 7

The Energy Commission's proceeding on the Potrero Power Plant Unit 7 Project was suspended based on Mirant's request, but the application could be re-activated. This project would provide a net increase in in-City generation. Because this project could be built in place of SFERP it has also been evaluated in this Staff Assessment as an alternative to the proposed project.

Mirant Corporation proposed to construct a 540 MW generating facility to expand the existing Potrero Power Plant. The proposed Unit 7 would be constructed adjacent to the existing Unit 3 generator. The Final Staff Assessment prepared by the Energy Commission staff identified significant impacts from use of cooling water from the San Francisco Bay and discharge of that water back to the bay, and prepared a report on alternative cooling technologies. Mirant submitted an AFC amendment presenting the option of using reclaimed water from the CCSF's SEWPCP, and hybrid cooling towers. As discussed above, the Potrero Unit 7 project has also been controversial for potential air quality impacts and environmental justice issues. There is no guarantee that this plant would be approved by the Energy Commission if the proceeding were reactivated. It could also possibly require a lease from the City's Port Authority and a provision of City wastewater for cooling.

CLOSURE OF POTRERO POWER PLANT UNIT 3

Potrero Unit 3 (207 MW) is significantly beyond its expected 30-year lifetime and is, therefore, inefficient and subject to frequent outages. As a part of the SF Action Plan (and prior to Unit 3's release from RMR agreements), a Selective Catalytic Reduction (SCR) retrofit of Unit 3 was completed in June 2005, which reduces the NOx emissions to a level of compliance with the air quality requirements of the BAAQMD.

CCSF has requested that the CA ISO define the conditions that would be required to allow closure of Potrero Unit 3, and CCSF believes that completion of the SFERP should provide for closure of generating units at the existing Potrero Power Plant complex (SFERP 2004aa). The SF Action Plan specifies that Potrero Power Plant Unit 3 can be released from the applicable RMR agreement once the three turbines that comprise SFERP and a fourth combustion turbine that CCSF intends to locate at the San Francisco International Airport are operational (SFPUC 2005a). Although the City cannot at this time guarantee that closure of in-City generation will in fact occur, it is the CCSF's objective in pursuing the SFERP to achieve this goal (SFERP 2004aa).

In the absence of the SFERP, given that Potrero Unit 3 would be the only baseload generating facility after closure of HPPP Unit 4, it seems unlikely that this plant would be

closed. Therefore, the No Project scenario assumes continued operation of Potrero Unit 3.

TRANS BAY CABLE PROJECT

The Trans Bay Cable Project is a high voltage direct current (HVDC) transmission line that is being proposed by Trans Bay Cable LLC, an affiliate of Babcock & Brown, in cooperation with the City of Pittsburg and Pittsburg Power Company, a municipal utility. It is also included in the San Francisco Peninsula Long-Term Transmission Planning Study Phase 2 Study Plan, Version 3.0 (April 1, 2004). The Project would transmit up to 400 MW of electrical power and provide a dedicated connection between the East Bay and the electrical system in San Francisco. The City of Pittsburg is serving as the Lead Agency for the purposes of CEQA for the project's upcoming environmental review process.

The Trans Bay Cable Project is described in detail above. The environmental review process and the preparation of an Environmental Impact Report will occur in 2005-2006. Although there is no certainty that this project will be approved and/or constructed, the Trans Bay Cable Project could be built independent of SFERP approval. Therefore, this project is evaluated under the No Project scenario as well as in this Staff Assessment as an alternative to the proposed project.

CLOSURE OF HUNTERS POINT POWER PLANT

HPPP Unit 4 can produce 170 MW and is one of only two baseload power plants in San Francisco (the other being Potrero Unit 3). Its closure, without other system improvements, would greatly affect local reliability. PG&E owns the power plant, and has an agreement with the CCSF to close it as soon as allowable, but the CA ISO is the authority that will determine when it can be closed in order to avoid serious effects on the region's ability to provide electric service.

The CA ISO letter of April 18, 2003, and the other communications define specific conditions that would be required for the CA ISO to allow implementation of the agreement between PG&E and the CCSF to close Hunters Point Power Plant. While the timing of this closure cannot now be determined, it does now seem likely that the plant will be closed when the Jefferson-Martin Transmission Project is completed (summer 2006).

PG&E PROJECTS CURRENTLY BEING PLANNED OR CONSIDERED

In the revised SF Action Plan adopted in November 2004, the CA ISO listed the projects which are necessary to release Hunters Point and Potrero from their RMR Agreements, ultimately leading to their retirement. These projects are listed in **ALTERNATIVES Table 5**. These projects involve increasing emergency ratings, upgrading or installing new transformers, modifying protection equipment, reconductoring, transmission upgrades, and installing new transmission lines. While these projects would provide a benefit to San Francisco Peninsula electric service and reliability, none (aside from the Proposed Project itself) would provide enough benefits to meet project objectives.

ALTERNATIVES Table 5
PG&E Electric Transmission Projects

#	Project	Description	Schedule	Resolution of Issue
Release Hunters Point Units 2 & 3 from their RMR Agreements				
1	Potrero Static VAR Compensator	Install +240/-1100 MVAR Static VAR Compensator at Potrero Switchyard	Complete (December 2004)	This project allows ISO/PG&E to meet NERC/WECC/CA ISO planning requirements with HPPP Units 2 and 3 released from RMR Agreement.
Release Hunters Point Units 1 & 4 from their RMR Agreements				
2	San Mateo Martin No. 4 Line Voltage Conversion	Reconductor and convert 60 to 115 kV circuit; modify substations at Burlingame and Millbrae.	Complete (July 24, 2004)	This project in combination with other projects allows ISO/PG&E to meet NERC/WECC/CA ISO planning requirements with HPPP Units 1 and 4 released from RMR Agreement.
3	Ravenswood 2nd 230/115 kV Transformer	Install a new 420 MVA, 230/115 kV transformer at Ravenswood.	Complete (May 2004)	This project in combination with other projects allows ISO/PG&E to meet NERC/WECC/CA ISO planning requirements with HPPP Units 1 and 4 released from RMR Agreement.
4	San Francisco Internal Cable Higher Emergency Ratings	To be used upon completion of Jefferson-Martin 230 kV Project. In 2007, a 3rd Martin-Hunters Point 115 kV cable will replace the emergency ratings.	Complete	This project in combination with other projects allows ISO/PG&E to meet NERC/WECC/CA ISO planning requirements with HPPP Units 1 and 4 released from RMR Agreement.
5	Tesla-Newark #2 230 kV Line Reconductoring	Bundling of the Tesla to Newark #2 transmission line.	Complete (May 2005)	This project in combination with other projects allows ISO/PG&E to meet RMR criteria planning requirements with HPPP Units 1 and 4 released from RMR Agreement.
6	Ravenswood-Ames 115 kV Lines Reinforcement	Reconductor Ravenswood-Ames Nos. 1 and 2 115 kV lines with 477 SSAC conductors	Complete (May 2005)	This project in combination with other projects allows ISO/PG&E to meet RMR criteria planning requirements with HPPP Units 1 and 4 released from RMR Agreement.
7	San Mateo 230 kV Bus Insulator Replacement	Replace bus insulator, an operations requirement during San Mateo bus wash.	Complete (May 2005)	Eliminate bus wash at San Mateo 230 kV bus will reduce the 400 MW generation operational requirement down to less than 200 MW.
8	Potrero-Hunters Point (AP-1) 115 kV Underground Cable	Install new 115 kV underground cable; coordinated with CCSF 3rd Street Light Rail Project.	December 2005 (CPUC permit approval granted)	This project in combination with other projects allows ISO/PG&E to meet NERC/WECC/CA ISO planning requirements with HPPP Units 1 and 4 released from RMR Agreement.
9	Jefferson-Martin 230 kV Line	Construct a new 230 kV line from Jefferson Substation to Martin Substation	March 2006 (under construction)	This project in combination with other projects allows ISO/PG&E to meet NERC/WECC/CA ISO planning requirements with HPPP Units 1 and 4 released from RMR Agreement.

**ALTERNATIVES Table 5
PG&E Electric Transmission Projects**

#	Project	Description	Schedule	Resolution of Issue
10	Potrero 3 SCR Retrofit	Retrofit of Potrero Unit 3 SCR	Complete (June 2005)	This project ensures the availability of Potrero 3 at full capacity thereby reducing overall Greater Bay Area RMR requirements. This project or the reduced capacity available without the retrofit in combination with the other listed projects allows CA ISO/PG&E to meet NERC/WECC/CA ISO planning requirements with HPPP Units 1 and 4 released from RMR Agreements
Release Potrero Unit 3 from its RMR Agreement				
11	SFERP and SFIA Electric Reliability Plant	Construction of 3 combustion turbines north of Martin Substation at Potrero point and 1 combustion turbine at SFIA.	2007?	These projects will allow CA ISO/PG&E to meet NERC/WECC/CA ISO planning requirements with Potrero 3 released from RMR Agreements.
Release Potrero Units 4, 5, & 6 from their RMR Agreements (assumes previous completion of peaking power plants by CCSF)				
12	Newark-Dumbarton 115 kV Line	Upgrade Newark-Dumbarton 115 kV line	May 2006 (engineering in progress)	This upgrade is needed in combination with the other listed mitigations to allow ISO/PG&E to meet NERC/WECC/CA ISO planning requirements with Potrero 4, 5, & 6 released from RMR Agreement
13	Bair-Belmont 115 kV Line	Upgrade Bair-Belmont 115 kV Line (under evaluation by PG&E)	May 2007	This upgrade is needed in combination with the other listed mitigations to allow ISO/PG&E to meet NERC/WECC/CA ISO planning requirements with Potrero 4, 5, & 6 released from RMR Agreement
14	Metcalf-Hicks and Metcalf-Vasona 230 kV Lines	Upgrade Metcalf-Hicks and Metcalf-Vasona 230 kV Lines	May 2007	This upgrade is needed in combination with the other listed mitigations to allow ISO/PG&E to meet NERC/WECC/CA ISO planning requirements with Potrero 4, 5, & 6 released from RMR Agreement
15	Ravenswood Substation Voltage Support	Add voltage support at Ravenswood Substation	May 2007	This upgrade is needed in combination with the other listed mitigations to allow ISO/PG&E to meet NERC/WECC/CA ISO planning requirements with Potrero 4, 5, & 6 released from RMR Agreement

Source: Edwards 2004a and 2004b.

INTERRUPTIBLE LOAD PROGRAM

As an alternative to constructing various components of the project, selective load dropping⁵ during peak load periods could be considered. During the summer of 2001, the CA ISO solicited bids for “interruptible load.” This process took the form of two distinct but similar programs in which various loads (customers) would be paid to interrupt or curtail load during peak load conditions. The CA ISO had targeted approximately 2,800 MW of statewide load for these programs. Initially, the CA ISO received bids totaling about 580 MW and currently actual statewide participation amounts to 55 MW. While there are many and varied reasons for the small amount of capacity that is participating in these CA ISO programs, the results point to the fact that there are relatively small levels of load that can contribute in a manner that will effectively and reliably reduce peak loads. The failure to interrupt one’s load at the times required is much the same as a local generator not being available or the occurrence of some other contingency. Given the level of constraints with the current PG&E system serving the Bay Area, it is doubtful that interruptible load sufficient to solve these problems could be placed under contract.

DEMAND-SIDE MANAGEMENT (CONSERVATION)

In July 2003, the San Francisco Board of Supervisors approved a \$16.3 million joint energy efficiency pilot project with Pacific Gas and Electric Company (PG&E) and San Francisco’s Department of the Environment (SF Environment). The San Francisco Peak Energy Pilot Program is designed to increase reliability by reducing peak energy demand for both residential and business customers.

This program is funded by California utility customers and administered by the investor owned utilities under the auspices of the CPUC. The ultimate goal of the program is to reduce electric demand during both the peak summer air conditioning and winter heating seasons. Implementation of the project will include nine energy efficient program elements aimed at reducing usage in San Francisco by 16 MW in January 2005 to assist in the closure of Hunter’s Point Power Plant.

Through a portfolio of energy efficiency programs, PG&E and SF Environment will work with hotel/motel, restaurant, and apartment owners. The programs are also designed to assist low-income residents and a special emphasis will target the Bayview-Hunter’s Point community.

In addition, PG&E, the investor-owned utility in the project area also uses a program of voluntary reduction in electricity use known as Customer Energy Efficiency (CEE). PG&E has had an active CEE program over the past two decades. Its cumulative reduction of use has been substantial. For any given planning area, the historical CEE energy and peak demand impacts have been subsumed within the peak load demands experienced year by year and thus their impacts are included in the forecast of peak growth. As for future potential CEE impacts, PG&E’s Local Integrated Resource Plan (LIRP) study indicates that only 4 MW per year could be obtained through aggressive locally focused CEE.

⁵ Load dropping can be at the discretion of the CA ISO and/or utility, or voluntarily at the discretion of the consumer.

Both of these programs provided important reductions in consumption, but they fall short of the long-term capacity needs in the project area, and therefore can only be viewed as an augmentation to other non-traditional wires solution options.

CURTAILMENT OF ELECTRIC SERVICE

During June of 2000, when exceptionally high demand due to a statewide heat wave coincided with the shutdown of units at local power plants and low hydroelectric generation in the northwest, PG&E was forced to institute rolling blackouts (for periods of one to three hours) at various locations throughout its territory. This type of scenario may have to be implemented again at times of peak demand if additional transmission and associated substation infrastructure is not provided. PG&E's load curtailment plans are structured so as to avoid curtailment of critical loads such as hospitals.

CONCLUSIONS REGARDING NO PROJECT ALTERNATIVE

If the No Project Alternative is selected, the SFERP would not be constructed. Energy required for local reliability and peaking requirements that would have been produced by the proposed facility would need to be generated by another source. Currently the sources of power that are available are older power generation facilities (Potrero and Hunters Point power plants). While HPPP Unit 4 is expected to close even in the absence of the SFERP when the Jefferson-Martin transmission line is online, the Potrero Power Plant is not expected to close absent the construction of new in-City generation. These power plants release larger quantities of NO_x than the proposed facility and have questionable reliability because they are between 27 and 45 years old.

The proposed project will produce electricity to increase the local electrical system's reliability while discharging less NO_x emissions for each energy unit generated when compared to other existing, older fossil fuel generation facilities. Further, the operating flexibility of the proposed combustion turbines, that is, a 10-minute start versus the current 24-hour start times for Potrero 3 and Hunters Point 4, affords operators greater flexibility in dispatching plants to meet system requirements. In addition, Potrero Unit 3 is a boiler facility and therefore has air emissions almost all the time (versus a simple cycle facility that only emits when operating). These characteristics provide beneficial environmental impacts. Potential environmental impacts from the No Project alternative would result in greater NO_x emissions because new power plants, including the proposed project, would not be brought into operation to displace production from older, higher NO_x -emitting plants.

Staff believes that, overall, the No Project Alternative is not superior to the proposed SFERP for the following reasons:

1. Without the proposed SFERP, it is less likely that the Potrero Unit 3 Power Plant would be closed in a timely fashion. The Potrero Unit 3 plant is older, has relatively high emissions, and is not as reliable as a newer facility.
2. Without the SFERP project, staff expects the net emissions of NO_x and PM₁₀ in the State would be higher because other older, less efficient power plants (either inside or outside of CCSF) would be required to produce more power.

3. The No Project Alternative may result in (1) building of a power facility elsewhere on the northern San Francisco Peninsula, and/or (2) construction of additional transmission facilities to meet necessary reliability criteria. Depending on their location, these facilities would also have environmental impacts that could be significant.
4. The No Project Alternative would result in reduced reliability for San Francisco's electrical supply.

APPENDIX B: ALTERNATIVES ELIMINATED FROM FULL CONSIDERATION

Alternatives analyzed in detail are presented in Appendix A. This appendix addresses the following categories of alternatives that are not pursued for full analysis in this Staff Assessment:

- Alternative power plant sites
- Transmission alternatives
- Renewable resource alternatives
- Demand-side management
- Distributed generation
- Integrated resources alternative.

ALTERNATIVE POWER PLANT SITES

The alternative sites listed below were evaluated, but not retained for full consideration. Each site is described in the subsequent sections, and its rationale for elimination is described.

- Cesar Chavez Site
- Illinois Street Site
- Pier 70
- Western Pacific Site
- Jessie Street Site
- Southeast WPCP
- Treasure Island
- The Presidio
- Cargo Way
- Gilman Avenue
- East Jamie Court
- Potrero Power Plant Unit 7 FSA Alternatives
- San Francisco Energy Center FSA Alternatives

Cesar Chavez Site

Alternative Description

The Cesar Chavez site is located west of the Western Pacific site, but is not on Port of San Francisco property. The site does not contain historic buildings. The site was presented in the AFC and is located near the Port of San Francisco's container terminal, west of the Western Pacific site. The site is developed and zoned Heavy Industrial. The surrounding land uses are industrial, with the Port's container terminal located to the south, industrial uses to the north. The San Francisco Municipal Railway (MUNI) is currently building a new streetcar maintenance facility due west of the site. The site is 2.8 acres, and includes an occupied building that would require demolition.

The nearest residences are located approximately 1,300 feet from the Cesar Chavez site, as opposed to 600 feet from the proposed SFERP site. The site is 0.4 miles south of PG&E's Potrero Substation, requiring less than 1.0 miles of underground transmission line in roadways. Water supply and discharge would be via the combined sewer system. For the Cesar Chavez site, the transmission interconnection would be

directly to the Potrero substation. Gas interconnection would be with the natural gas transmission line at Cesar Chavez and Illinois Streets (SFERP 2004a).

Rationale for Elimination

Due to the proximity of the Cesar Chavez Alternative to the SFERP site, impacts of this alternative would be similar to those of the proposed SFERP project. However, an additional disadvantage of the Cesar Chavez site as compared to the proposed SFERP site is that the owner has not shown any interest in selling the property to the City, notwithstanding a number of overtures by CCSF to commence negotiations. Moreover, according to the owner, the title to the property may become disputed as it is community property and the owner has been in the process of a divorce (SFERP 2004a).

A further disadvantage of the property is that the parcel size is small (2.8 acres), and at best minimally adequate for the installation of the SFERP. The applicant has indicated that 3.5 acres is the minimum size parcel to site 3 turbines (SFERP 2004q). The small size would require designing the power plant with a compressed layout. This effort would increase construction and maintenance costs for the project. In addition, there would be no space available for a water treatment facility, requiring that this equipment be located elsewhere. Therefore, although this alternative reduced cultural resources impacts and would be located approximately 700 feet farther from residences, due to feasibility issues associated with gaining site control and the small size of the parcel, while also being located in close proximity to the proposed project (approximately 0.4 miles south), this alternative was eliminated from full consideration.

Illinois Street Site

Alternative Description

The Illinois Street site is located 200 feet south-southeast across the street from the proposed project site on the southern side 23rd Street and Illinois Street. The site is approximately 11 acres of developed land that is zoned heavy industrial and is surrounded by industrial uses to the north, south, and east, with commercial/industrial land uses to the west. The setting of the Illinois Street site is very similar to that of the proposed site, and they have the same industrial surroundings (PG&E's Potrero Substation and Mirant's Potrero PP).

The presence of existing industrial structures on the site will require demolition and the site is within 500 feet of residential areas. Although the proposed site would also require the demolition of existing structures, an advantage of the Illinois site is that demolition of historic buildings required at the proposed site would not occur, whereas use of the Potrero site would require demolition of the Compressor House and Station A.

The site is near PG&E's Potrero Substation and natural gas pipeline. Water supply and discharge would be via the combined sewer system. For the Illinois Street site, the transmission interconnection would be directly to the Potrero Substation. Gas interconnection would be at the same interconnection point as the proposed SFERP project, approximately 200 feet from the proposed site (SFERP 2004a).

Rationale for Elimination

Due to their proximity, impacts of the Illinois Street Alternative would be similar to the proposed SFERP project. In addition, ownership of the Illinois Street site is complex, involving multiple owners and real estate trusts. These entities, as represented by the managing owner, have not appeared interested in selling the property to CCSF. Moreover, the shape of the parcel is irregular, including a large amount of land that would be of little use to the City and that contains buildings, such as warehouses from an old sugar refinery. In preliminary negotiations, CCSF was informed that if they proceeded with a transaction at all, the owners would likely insist on sale of the entire parcel because fragmentation would likely render the remaining property unsaleable. Thus, the cost to CCSF would likely increase because the City would be required to buy more property than it needs (SFERP 2004a).

Therefore, given the complex land ownership, and the general lack of interest in a sale on the part of the owners, CCSF deemed obtaining the Illinois Street property to be uncertain. A further disadvantage of the property is that it would likely have required CCSF to acquire substantially more property than needed to site the SFERP with the attendant additional costs and the site is approximately 100 feet closer to residences than the proposed SFERP site. This alternative would not reduce impacts of the proposed project without creating new impacts of its own, and, therefore, the Illinois Street Alternative was eliminated from further consideration.

Pier 70 Site

Alternative Description

This site was evaluated as an alternative in the AFC for this project. The site would be located at the eastern end of 22nd Street approximately 400 feet north of the proposed SFERP site. Most of the Port's property, including most of Pier 70, consists of former public tidelands, which are held in public trust for the people of California. As trustee since 1969 pursuant to the Burton Act, the Port Commission is responsible for managing this property on a self-supporting basis in conformance with the Public Trust Doctrine. Under this doctrine, the Port is required to promote navigation, fisheries, and maritime commerce, to protect natural resources and to develop recreational uses that attract people to enjoy the Bay and waterfront (Wilson 2004). The San Francisco Bay Conservation and Development Commission (BCDC) is charged with ensuring that development of public trust lands on the Bay occurs in the public interest (SFERP 2004a).

For several years the Port has been actively trying to find ways to preserve and develop the historic structures while preserving the present maritime uses. The Port has identified areas of Pier 70 outside of the ship repair area that it would like to find developers for.

A few years ago, a process was started that would have brought in two entities to develop different parts of the area. One entity was a private developer that planned on building several commercial buildings and the other was a group of arts organizations that hoped to develop several historic shipyard buildings into arts facilities. However, in the economic decline of the past 5 years, this initiative has failed.

The planners at the Port have become increasingly concerned about the condition of several of the historic buildings on the Pier 70 site. Two of the most important, Buildings 104 and 113, are unreinforced masonry. Recently the decision was made to mothball them, which means they may not be used or occupied in any way until they have been seismically strengthened. Other structural problems affect the historic structures, including leakage and broken windows. Port planners express a sense of urgency about pursuing “adaptive reuse” of the historic buildings as the only viable way of preserving them (Wilson 2004).

A major non-profit organization, the Exploratorium, expressed tentative interest in Pier 70 as a future home. This innovative science museum considered reusing a number of Pier 70 historic structures. Some public agencies also expressed interest, but were not in a position to move forward quickly. The Port responded to this interest by issuing a Request for Proposal (RFP). This effort began to detail the conditions required of an entity leasing and developing parts of Pier 70. In the spring of 2004, just as the RFP drafting process was nearing completion, the Exploratorium announced that it was looking at a different location on the waterfront for its future home, although a new location has not yet been decided. The Port then concluded that it would not go forward with an RFP at this time, therefore, the future use of this site is uncertain (Wilson 2004).

For the Pier 70 site, electrical interconnection would be to breaker bays located at the north end of the Potrero substation. Natural gas interconnection would be at the same interconnection point as the proposed SFERP project, approximately 750 feet south of this alternative site (SFERP 2004a).

Rationale for Elimination

Due to their proximity, impacts of the Pier 70 Alternative would be similar to the proposed SFERP project and the Pier 70 site would be approximately 400 feet farther from residences. In addition, the Port of San Francisco’s Pier 70 site is close to the required infrastructure (natural gas and the PG&E Substation). However, the site is part of a potential historic district and would require either the alteration of historic buildings or their removal. The Port also hopes to eventually redevelop this area in a manner consistent with the Public Trust Doctrine. The Pier 70 location includes significantly more historic structures than the proposed SFERP site. These buildings would either have to be incorporated into the plant design, substantially increasing the cost of the project, or demolished. Therefore, due to greater cultural resources impacts, inconsistency with the Public Trust Doctrine, and potential difficulties obtaining site control from the Port, this alternative would not reduce significant impacts of the proposed project without creating greater impacts of its own.

Western Pacific Alternative, San Francisco

Alternative Description

The Western Pacific Alternative is located in CCSF, adjacent and overlapping the proposed SFERP site on a 9-acre parcel within the San Francisco Port Commission’s jurisdiction. The parcel is adjacent to the Port’s container terminal, at the eastern end of Cesar Chavez and 25th Streets. The alternative site is undeveloped and borders the San Francisco Bay on its northern and eastern sides. The site is zoned Heavy Industrial

and is surrounded by industrial facilities. The Port of San Francisco's Pier 80 marine terminal is located immediately adjacent and to the south; other industrial uses are located north of the site, and the San Francisco Municipal Railway (MUNI) is currently constructing a streetcar maintenance facility due west of the site. Water, gas, and transmission access would all be similar to the Proposed SFERP.

Rationale for Elimination

The Western Pacific Site is nearly identical to the proposed SFERP, but it is on a parcel further east and adjacent to the San Francisco Bay. Therefore, the construction of the three turbines at the site would create land use and regulatory feasibility concerns. The alternative site is in the State Land Trust and is subject to the public trust for navigation, waterborne commerce and fisheries. In the past, electric power plants that depend upon Bay water to operate have been permitted on trust lands. However, the three turbines that comprise the SFERP do not require a waterfront location for their operation. The common law Public Trust doctrine and the case law interpreting the doctrine recognize that trust lands may be used for purposes that are not inherently water dependent, as long as they directly promote trust purposes. Examples of this type of use would be cargo warehouses or railroad terminals. Since the SFERP does not clearly satisfy the criteria for trust permitted uses, a proposed use of the Western Pacific site for this purpose would be subject to scrutiny by the Attorney General, who is charged with enforcement of trust restrictions, and the State Lands Commission, a state agency responsible for overseeing local trust grantees (CEC 2002a).

The Port plans to develop and integrate the Western Pacific site into its Pier 80 operations through creation of a Pier 80 Terminal Complex, to add open yard and covered shed space to accommodate cargo distribution, assembly and processing related to the Pier 80 terminal operations (SFERP 2004a). As a result, the use of this alternative site may not be compatible with the Port's plans to enhance its marine terminal capabilities at Pier 80. In addition, given the issues of compatibility with the Port's marine terminal plans and the uncertainty as to consistency of the use under the trust doctrine, the use of this location would be lengthy and the outcome uncertain (SFERP 2004a).

The Western Pacific Alternative is also within the Bay Conservation and Development Commission's (BCDC) jurisdiction as the parcel is less than 100-feet inland from the Bay. The use of this site would need to be evaluated under BCDC's San Francisco Bay Plan. The primary issues that will need to be addressed are:

- Whether the project would provide maximum feasible access, consistent with the project;
- Whether the project is consistent with the Bay Plan policies on appearance, design and scenic views;
- Whether the project is consistent with the Bay Plan policies on water quality; and
- Whether the project is consistent with Section 66645 of the McAteer-Petris Act and the required "Power Plant Non-Siting Study" approved by the Bay Commission in compliance with the Act.

Use of the Western Pacific Alternative may conflict with plans of the Port of San Francisco, which may develop and integrate the Western Pacific site into its Pier 80 operations. Additionally, because the SFERP would not depend on seawater for any

aspect of operations, use of this site may not be consistent with the common law Public Trust doctrine, which generally reserves the lands for uses that are water-dependent. The Western Pacific Alternative site would not reduce any potentially significant impacts of the proposed project yet would be more likely to create a land use conflict with the plans of the Port of San Francisco and the Public Trust doctrine, as well as raise additional BCDC issues. Therefore, it was eliminated from full consideration in this Staff Assessment.

Jessie Street Alternative

Alternative Description

The Jessie Street Alternative would be located at the NRG/SF Thermal facility at 460 Jessie Street between 5th and 6th Streets, near the U. S. Mint building in downtown San Francisco. The SF Thermal (NRG) facility provides steam heat from four old boilers to certain facilities in the downtown area around the clock. Steam demand varies from 40,000 to 340,000 pounds per hour. Besides the existing power plants at Hunters Point and Potrero, these boilers, which produce approximately 20 ppm of NOx in their emissions, represent the largest stationary NOx emissions source in CCSF (SFERP 2004aa).

The NRG facility has an adjacent Priority Parking commercial parking lot immediately west of the steam plant that is approximately 204 feet long by 162 feet wide. The parking lot would likely be large enough for a maximum of one LM-6000 gas turbine-generator set. The parcel is zoned C-3-S (Downtown Commercial/Downtown Support). Uses are limited to commercial office, retail, and light manufacturing. In addition, the parcel is subject to two height restriction zones, 90-X and 160-F indicating maximum height of structures of 90 and 160 feet (based on an opinion issue in May 1995 by Robert Passmore, San Francisco City and County Zoning Administrator, a cogeneration plant would be exempt from this requirement) (CEC 1995).

ALTERNATIVES Figure 10 depicts residential buildings within the immediate vicinity of the Jessie Street Alternative site. Within a single city block to the east, south, and west of the alternative site, there are well over 620 residential units, all in the form of residential hotels offering weekly and monthly stays to low-income tenants. Immediately adjacent to and overlooking the western end of the parking lot where the turbine would be located there are four buildings containing more than 120 total units. In addition, the Bayanihan House, located at 88 6th Street on the corner of Mission Street (less than 500 feet from the site), is a low-income single-room occupancy (SRO) facility with 120 units. **ALTERNATIVES Table 6** lists the population and demographics for the U.S. Census Blocks of the alternative site and the surrounding area. Approximately 1,595 people live within two city blocks of the Jessie Alternative site with an average minority population of 72.5 percent (U.S. Census 2000).

ALTERNATIVES Table 6
Population and Demographics around the Jessie Alternative

Census Block*	Land Area (square meters)	Residential Population (single race)	Population Density (total population/ 1 square mile)	Non-White Population
1004	8,310	0	0	0
2000**	14,226	72	13,108	73.6%
2001	17,743	74	11,093	73.7%
2002	17,990	13	2,015	78.6%
2003	36,715	469	34,707	58.3%
2004	13,932	77	14,872	70.0%
2005	11,488	474	111,598	90.5%
2010	16,820	416	68,676	67.7%
TOTAL/ MEAN	137,224	1,595	36,581 (excluding Census Block 1004)	72.5%

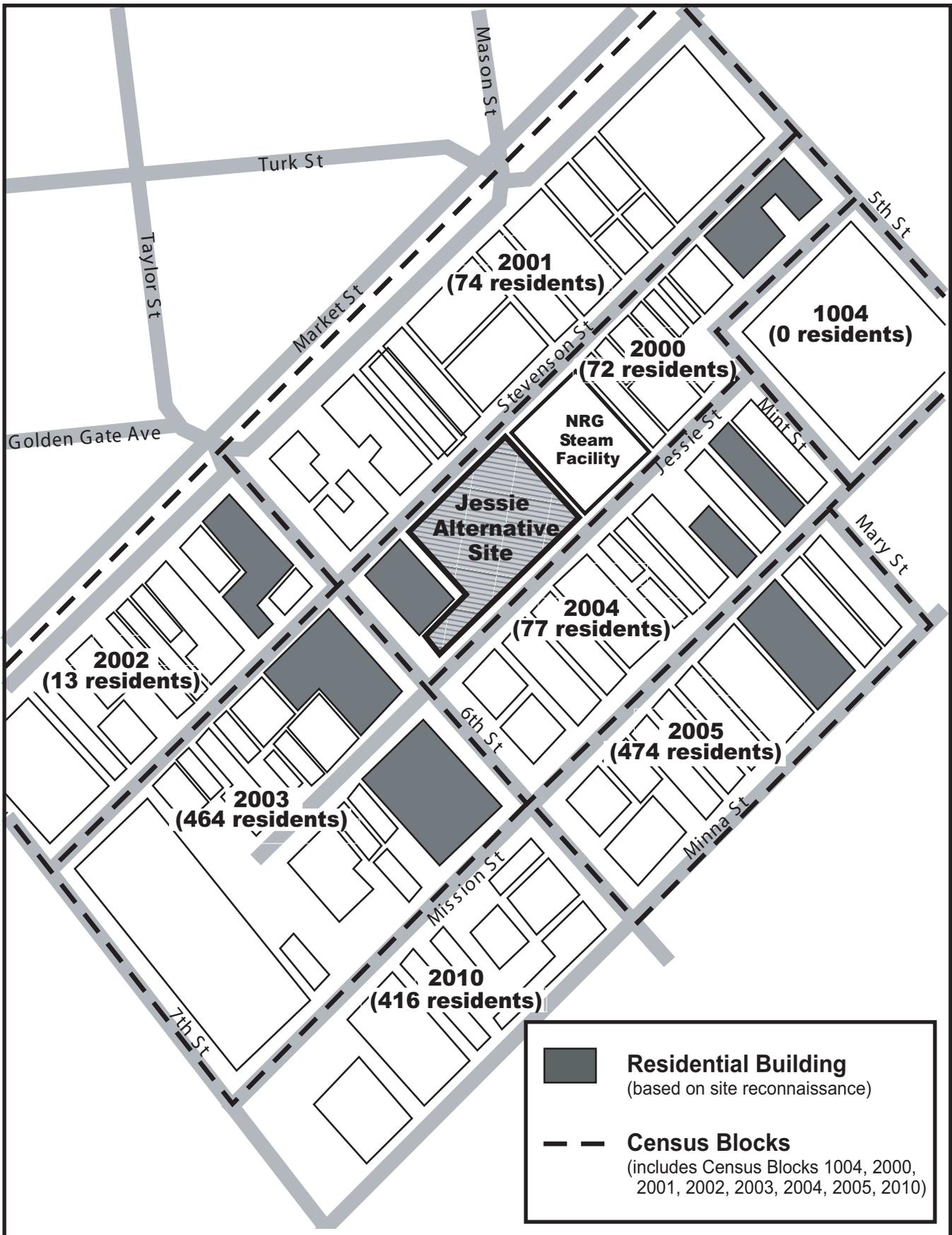
Source: U.S. Census 2000

*All of the identified Census Blocks are within Census Tract 17601.

**The Jessie Alternative is located within Census Block 2000.

ALTERNATIVES - FIGURE 10

San Francisco Electric Reliability Project Supplement A - Residential Land Uses Near the Jessie Street Alternative Site



CALIFORNIA ENERGY COMMISSION, SYSTEMS ASSESSMENT & FACILITIES SITING DIVISION, FEBRUARY 2006

SOURCE: Aspen Environmental Group

Rationale for Elimination

The site is surrounded by inhabited commercial and residential buildings that are four or more stories in height. Because the design of a combustion turbine project must include cooling towers, special considerations would be required to ensure that cooling tower plume is dispersed away from and above these buildings. Similarly, exhaust gases from the gas turbine will need to be dispersed at an elevation higher than the roofline of the surrounding buildings. A chimney equal in height to that of the existing steam plant would probably be required. This may have a performance impact on the gas turbine since the manufacturer sets a maximum backpressure (measured in inches of water) at the turbine exhaust.

The NRG facility is a cogeneration facility that would produce steam for CCSF's steam loop. The electrical interconnection would require looping the 115 kV Potrero-Larkin transmission line, located one quarter of a mile from the proposed site, into a new plant substation. The natural gas interconnect was approximately 1.2 miles from the site at 17th and Missouri. A recycled water supply for the facility was not clearly identified but was at least 1.5 miles from the site (SFERP 2004aa)

The Jessie site was eliminated by CCSF due to the high capital costs and financial risks associated with stipulations in the DWR Power Purchase Agreement (PPA). The capital costs of the Jessie Alternative (\$87 million) versus the airport (\$38 million) differed on the order of \$40 to \$50 million and CCSF had been given informal indication by the DWR that it would resist paying those additional costs under the DWR PPA (SFERP 2004aa). Some of the factors that adversely affect the capital cost of the site include: high utility interconnection costs (especially the 1.2-mile natural gas and recycled water lines), the need to enclose the equipment in a building, limited building space and no construction lay-down area, high PG&E network costs, the need to build an elevated parking structure for NRG's use, and the difficulty in keeping the steam plant operational while the new plant within it is built. NRG has also demanded that the cogeneration design be oversized to meet their total steam load rather than economically designed to meet only part of their normal needs (SFERP 2004aa). The net effect is that the high plant capital costs at the Jessie site cannot be supported by electricity market prices, even estimating the potential impacts of locational marginal pricing. Therefore, CCSF would have to assume substantial risk for the NRG project to move forward.

In addition, under the DWR PPA, CCSF faced a site control deadline of December 1, 2003 and there were no prospects for any kind of agreement with NRG within that timeframe. In a meeting between NRG and CCSF, NRG had indicated that some of CCSF's assumptions about operations would not be workable given NRG's operational needs, resulting in additional costs at the site (SFERP 2004aa).

A power plant would not be consistent with land use restrictions imposed by the C-3-S zoning designation. In addition, there are also potential air emission impact concerns given the configuration of the residential and commercial buildings surrounding the site. With many residential units directly adjacent to the parking lot site to the west and over 620 units within a city block, there is high potential that air emissions would directly affect these residents. There would also be environmental justice concerns in the area, due to the low-income status of the residents.

From a purely technical standpoint, a cogeneration plant located at NRG could be permitted within accepted Federal and State air emissions standards (SFERP 2004aa). By displacing some of the output of the existing process steam boilers, that have relatively high emissions, with a modern combustion turbine in a cogeneration configuration, the net regional air emissions impact is reduced due to efficiency gains.

However, the cogeneration plant which now produces both electric and steam energy produces more total energy at the NRG location and so more fuel is consumed at this location. Correspondingly, net air emissions at the NRG location increase. Due to the combination of NRG's location near the downtown area and the relatively low buoyancy of the emission sources (due to the much cooler exhaust stack temperatures and adjacent tall buildings), the largest concentrations of these air emissions would occur in CCSF. In contrast, the largest concentrations of air emissions from combustion turbines located at either the airport or the proposed SFERP site will occur over the Bay. This is due to a combination of factors including the site location near the eastern shoreline, greater buoyancy of exhaust gases and predominant westerly winds at the time of year that the combustion turbines are most likely to operate (SFERP 2004aa).

Finally, this site would accommodate only a single turbine, and the SFERP project as proposed is for three turbines. For all of the reasons defined herein, consideration of this site as an alternative is not merited.

Southeast WPCP

Alternative Description

CCSF reviewed the Southeast Water Pollution Control Plant (SEWPCP), where the abandoned sludge drying facility is currently located, as a potential site for SFERP. The site is adjacent to an asphalt plant and I-280. Building a new combustion turbine would require removal of an existing exhaust stack that is taller than the combustion turbine stack.

Electrical interconnection would require looping the proposed Potrero-Hunters Point 115 kV cable⁶ into the site. The site is located approximately 0.3 miles from the future location of the cable. Natural gas interconnection would be approximately 0.5 miles from the site near Highway 101. Water and sewer service would have been provided by the SEWPCP (SFERP 2004a).

Rationale for Elimination

This proposed site was not evaluated by CCSF because the communities in the vicinity of Hunters Point Substation have borne and continue to bear the impacts from substantial industrial activity, most notably the Hunters Point Power Plant and the SEWPCP itself (SFERP 2004a and SFPUC 2005a). In addition, there are potential land use impacts associated with nearby residences. Thus CCSF did not consider siting new City-sponsored generation in the Hunters Point area where the SEWPCP is located.

⁶ PG&E has proposed construction of an underground 115 kV cable that would pass the northwest side of the WPCP along Evans Avenue. This proposal is currently being evaluated by the CPUC in Application A.03-12-039.

Treasure Island

Alternative Description

This alternative was suggested by members of the public during the course of the public scoping period for the SFERP. Treasure Island is a 450-acre manmade island, which is attached to a natural island, Yerba Buena Island (547 acres). It is located in the San Francisco Bay, approximately 2 miles east of San Francisco and 4 miles west of the Port of Oakland. The island can be reached by motor vehicle only via the San Francisco-Oakland Bay Bridge.

Treasure Island was constructed in 1938/1939 for the purpose of hosting the Golden Gate International Exposition to celebrate the engineering marvels achieved by the completion of both the Golden Gate and Bay Bridges, as well as acknowledge the ascendancy of California and San Francisco as an economic, political and cultural force in the increasingly important Pacific region (TIDA 2004). The construction of Treasure Island began in February 1936 and was completed in January 1939. To build the island, 29 million cubic yards of sand and gravel were dredged from the Bay and the Sacramento River delta and approximately 259 thousand tons of rock were used to create a rock seawall to contain the Island. Therefore, the island is generally underlain by about 30 feet of artificial fill material, which overlies 20 to 30 feet of soft, Young Bay Mud. Significant ground liquefaction occurred here during the Loma Prieta Earthquake in 1989 (CEC 1995).

Starting in 1997 when the naval station closed, CCSF became the primary steward of the island and created the Treasure Island Development Authority (TIDA), a non-profit, public benefit agency dedicated to the economic redevelopment of the island. The Treasure Island Conversion Act of 1997 granted the TIDA the powers of a California Redevelopment Agency, as well as the rights to administer Tidelands Trust property, subject to certain duties and responsibilities of the California State Lands Commission.

Although the availability of usable island space for a power plant is unknown, most likely such a facility would be sited on the north side of the island because it is more industrial (CEC 1995). Regardless of its location on the island, a power plant would most likely impact a variety of land uses. As a naval station, there were both industrial and residential areas on the island. Current land use on the island is also mixed, with former naval personnel and family housing, commercial land uses, small ship docking facilities, old service barracks, a combined elementary and middle school, a charter high school, and various entertainment and recreation facilities.

In January 1999 the TIDA authorized then-Executive Director Annemarie Conroy to sign a contract with the John Stewart Company to rehabilitate, rent and manage approximately 775 residential units on Treasure and Yerba Buena Islands. In addition, TIDA offered housing opportunities to the economically disadvantaged by signing a sublease with the Treasure Island Homeless Development Initiative (TIHDI), a coalition of service-providing organizations. In December 1999 about 50 pioneer families and individuals moved into TIHDI's newly renovated units. TIHDI member organizations now occupy a total of approximately 225 units (TIDA 2004).

Future redevelopment plans include the construction of 2,800 new housing units (33 percent would be made affordable), luxury hotels, a new ferry terminal, new conference and visitor centers, and more than 200 acres of recreational and open space. The Navy and CCSF are still negotiating the complete transfer of the property, which must first undergo extensive environmental cleanup at a cost of between \$60 and \$80 million.

Treasure Island, with a load of only 2 to 3 MW, receives its electricity at Western Area Power Administration rates via a submarine cable from PG&E's Davis Substation in Oakland. Natural gas is also received from Oakland via a 10-inch submarine pipeline, which operates at 120 psi (Zorzynski 2004). Water, however, is obtained from CCSF on the San Francisco span of the Bay Bridge to a filling reservoir on Yerba Buena Island, which drains down to Treasure Island.

Significant upgrades especially to the PG&E's transmission and natural gas distribution lines would be needed to handle the added capacity for the turbines. Given the construction of the new eastern span of the Bay Bridge, the existing transmission and gas submarine lines from Oakland will have to be relocated (Zorzynski 2004). Depending on the timing of the two projects, the added capacity could be incorporated into the plans for the new lines, however, the upgrades to the lines on the Island would still be necessary and submarine lines to San Francisco would have to be constructed to export the generated power to CCSF. Another option for transmission would be to build new lines to the closest major transmission interconnection at the Embarcadero Substation, located at First and Folsom Streets in San Francisco. This route would require over 2 miles of transmission line, either installed on the Bay Bridge (unlikely due to Caltrans' policies of not allowing new utilities in its ROW) or as submarine cable, and then undergrounded through a highly developed and congested areas in the City.

Rationale for Elimination

There is inadequate infrastructure (transmission lines, natural gas) and geotechnical concerns related to building on fill. Site contamination and cleanup activities associated with the transfer of property to CCSF would make it difficult to construct the turbines within the timeframe required in the DWR PPA, which requires commercial operation by June 1, 2005. Finally, the plans for residential development existing and proposed on the island would also make a power plant at this site incompatible with current and future land uses and the redevelopment plan, because the turbines would be in close proximity to a large number of residences.

The Presidio

Alternative Description

This alternative was suggested by members of the public during the course of the public scoping period for the SFERP. The Presidio is a 1,481-acre reserve, renowned for its scenic setting and rich historic and natural features. The Presidio is part of the Golden Gate National Recreation Area (GGNRA), and is managed by the Presidio Trust under the Presidio Trust Act, in partnership with the National Park Service. The Presidio has 991 acres of open space as well as 28.5 miles of hiking, biking, and multi-use trails, a golf course, a bowling alley, Rob Hill campground, picnic sites, tennis courts, ball fields, indoor swimming and gymnasium facilities, and windsurfing areas (Presidio 2004).

The Presidio's transformation from military post to national park began in 1972 when Congress created the GGNRA, a vast network of historic sites and preserved open space that today links 75,500 acres along the San Francisco Bay Area coast. In the legislation that established the GGNRA, Congress mandated that the Presidio, then an active U.S. Army post, would become part of the GGNRA if the installation became superfluous to the military.

Because of the former post's city-like infrastructure, its nearly 800 buildings, and its expansive cultivated forest and natural areas, funding the Presidio's operation and long-term care was much more costly than traditional parks. In 1996, Congress devised a management and funding model unique among national parks, and created the Presidio Trust to preserve the Presidio's natural, scenic, cultural, and recreational resources, and to become financially self-sufficient.

The National Park Service manages the Presidio's coastal areas. The Trust and National Park Service cooperate to preserve open space, plan for the trails system, provide for public safety, and offer public programs.

The Presidio itself is a National Historic Landmark with 768 structures, 469 of which are historic. The park includes architectural styles from every major military construction period since 1848, including Italianate, Greek Revival, Mediterranean, and Mission Revival and is a significant archaeology site, featuring prehistoric, 18th century Spanish, Mexican, and American artifacts (Presidio 2004).

In addition, the Presidio shelters 280 native plant species, 16 of which are rare or endangered, such as the San Francisco lessingia and the Raven's manzanita. It features a 300 acre planted historic forest; key species include Monterey cypress, Monterey pine, and blue gum eucalyptus. The Presidio is a refuge for more than 200 species of birds as well as a variety of mammals, reptiles, and aquatic species (Presidio 2004).

The Trust itself preserves, enhances, and maintains the Presidio's interior lands. Using annually declining federal appropriations as well as private investment, the agency is rehabilitating former Army buildings as civilian homes, workplaces, and public facilities. The revenues earned through leasing are used to operate the park, preserve its natural and cultural resources, maintain its infrastructure, and ensure its long-term care. The Presidio Trust is required to operate without direct federal appropriations following a 15-year transition period, which ends at the end of fiscal year 2012 (Presidio 2004).

None of the plans for the Presidio's future include power plant development. In fact, the Presidio Trust Act says, "as part of the Golden Gate National Recreation Area, the Presidio's significant natural, historic, scenic, cultural and recreational resources must be managed in a manner which is consistent with sound principles of land use planning and management, and which protects the Presidio from development and uses which would destroy the scenic beauty and historic and natural character of the area and cultural and recreational resources (P.L. 104-333)" (Presidio 2004). The Final General Management Plan Amendment for Presidio of San Francisco calls for the removal of 276 non-historic and historic buildings to enhance the site's recreational, cultural, and natural resources.

Open in June 2005 on the eastern end of The Presidio is the Letterman Digital Arts Center, a 23-acre campus that houses Lucasfilm divisions such as Industrial Light and Magic and LucasArts Entertainment Company. The Letterman Digital Arts Center is the largest development project approved by the Presidio Trust, which chose Lucasfilm to develop the site in 2000, after evaluating proposals from four finalists. The federal agency says Lucasfilm's \$6 million in annual rent is vital for the park to reach financial self-sufficiency by 2013, as mandated by Congress.

Building 1040 was at one time designated as a powerhouse and steam plant. The steam plant consisted of four old boilers, which were used for district heating only for the former Letterman Hospital complex (CEC 1995). There is no power generation. Building 1040 is now closed as an historic building and there are no plans or funds identified for its rehabilitation. The most industrial area in the Presidio, and as a result the most likely location for turbines within the Presidio, would be along Doyle Drive (which is also in the vicinity of Building 1040), although the area is currently planned for redevelopment under the Doyle Drive Expansion project (Pelkas 2004).

At one time an independent developer approached the National Park Service (NPS) and offered to supply district heating at no cost, and sell excess electricity generated energy to PG&E. This offer was refused, because the plan was determined to be inconsistent with the Presidio's national park status (CEC 1995).

Currently, approximately 2,000 people work for a mix of about 150 non-profit, for-profit, and government organizations within the park. Approximately 2,400 people live in the Presidio in 1,000 households (Presidio 2004).

The Presidio's utility systems date from almost every period of the Presidio's history of development as a military installation. Consequently, many of its older facilities have required significant upgrading and replacement and the Trust has an ongoing program of capital investment in its infrastructure systems. Utilities in the Presidio include water treatment, water distribution, wastewater collection, solid waste disposal, and electrical distribution. The Trust has water resource management responsibilities and authorities to provide water to Presidio users. Historically, the Presidio water needs have been met by Lobos Creek water, which is treated at the Presidio Water Treatment Plant (PWTP) and supplemented by water purchased from the SFPUC. In addition, the Army also operated several groundwater wells located near the existing PWTP, golf course and Mountain Lake. These wells were taken out of service before the Trust assumed jurisdiction, and the Trust has no plans to utilize groundwater for future water supplies (Presidio 2002).

Daily flow in Lobos Creek ranges from 1.2 million gallons per day (mgd) in dry years to 2.1 mgd in wet years. Between 0.7 and 1.6 mgd of Lobos Creek water is available in any given year for diversion, treatment and use at the Presidio. Historically the SFPUC has supplied up to one-third of the Presidio's water demand, and several points of interconnection are currently maintained. The amount of water purchased varies by year, however, and last year the Trust purchased approximately 15% of the average daily amount used at the Presidio. In addition to the water conservation, the concept of providing recycled water as a way to reduce potable water consumption for non-potable

uses (i.e., irrigation) has long been considered as a future goal at the Presidio (Presidio 2002). Water for the turbines would most likely have to be obtained from the SFPUC.

In 1999, 21,208 MW-hours of electricity were distributed at the Presidio serving 2.9 million square feet of buildings. The total load capacity of the Presidio's electrical infrastructure is 7,307 kilovolt amps (kVA). PG& E feeders entering into the Presidio currently have approximately 3,000 kVA of spare capacity. Existing current demand at the Presidio is 4,307 kVA (Presidio 2002).

The Trust operates and maintains the electrical distribution system at the Presidio. The system consists of approximately 42 miles of aboveground and underground electrical lines. The Presidio is a bundled service customer of PG& E, and receives electric service at primary voltage at two major points of connection (Greenwich and Main Post substations). The Trust's high voltage department then distributes power to the various facilities at the Presidio. The high voltage department maintains two major substations (Greenwich and Main Post), as well as 12 emergency backup generators at various buildings across the Presidio (Presidio 2002).

The Trust has several ongoing projects and practices to maintain the integrity and reliability of the electrical distribution system at the Presidio including substation upgrade and maintenance. Additionally, the trust is planning a major distribution system condition assessment to establish and prioritize long-term maintenance goals. The Trust is also in the process of completing an Energy Management Strategy, which will establish a framework for meeting projected energy demands at the Presidio. The strategy will evaluate the feasibility of implementing various on-site generation and cogeneration systems, including microturbines, fuel cells and photovoltaic panels. On-site generation will enhance the reliability of the Presidio's electrical supply and demonstrate the commercial viability of these emerging technologies (Presidio 2002).

The natural gas distribution facilities at the Presidio are owned and operated by PG&E. In 1990, 6.7 million therms of natural gas were distributed through the system to the U. S. Army and other users at the Presidio. In 1999, 1.2 million therms of natural gas were distributed to users throughout the Presidio (Presidio 2002). The turbine would likewise obtain natural gas from the PG&E system.

Rationale for Elimination

The Presidio is part of the National Park system, and siting a power plant at the Presidio would be viewed by the federal Government as an incompatible land use, inconsistent with the mission of the National Park Service. In addition, the use of a Presidio site has the potential to create significant environmental impacts (greater than those at the proposed SFERP site), most notably to residential land uses (2,400 people live in the Presidio), recreation, cultural, and visual resources. The site would require long transmission lines in order to connect to a 115 kV substation located in downtown San Francisco, and even longer water pipelines to either the SEWPCP (located at 3rd Street and Jerrold Avenue near the proposed SFERP site) or Oceanside Water Pollution Control Plant (adjacent to the San Francisco zoo in the western side of the City)

Cargo Way

This site was approved by the Energy Commission as the site for the San Francisco Energy Company's (SFEC) power plant in 1995. However, the project proponent was unable to secure a lease for the project from the Port Commission, so the power plant was never constructed. The site was also evaluated by Energy Commission staff as an alternative for the Potrero Unit 7 Project.

Alternative Description

This site is on Port of San Francisco land (property SWL 344.1) at the southwest corner of Cargo Way and Amador Street. This site was evaluated an alternative in Mirant's AFC for Potrero Unit 7 and it was evaluated by Energy Commission staff as an alternative for that project. The Cargo Way site is undeveloped but is surrounded by industrial land uses, and the closest residences are approximately five to six blocks to the south. This distance is farther from the nearest residences than is the proposed SFERP site, but generally closer to the Hunters Point residential area (CEC 2002a).

According to the CCSF, this site is zoned M-2, Heavy Industrial, with a maximum structure height restriction of 40 feet. This site is reserved for maritime support uses since it is near Islais Creek Channel. The Seaport Plan does not consider the power plants to be maritime uses. However, the Port of San Francisco in its Waterfront Land Use Plan has declared this site as surplus to maritime needs and recommends changing its designation to allow specified non-maritime uses. On January 10, 1995, the Seaport Plan Advisory Committee issued a set of proposed amendments to the Seaport Plan that would result in the removal of 22 acres from the maritime use restrictions established in the Seaport Plan. This acreage is enough to accommodate power-generating facilities without adversely impacting existing and future maritime uses in this area (CEC 2002a).

A 115 kV transmission line would have to be constructed to the Hunters Point Substation (approximately one mile to the southeast). Natural gas is available in proximity to the site. Water could be obtained from the SEWPCP approximately 0.5 miles south on Jerrold Street and Phelps Streets.

Rationale for Elimination

This alternative site was not evaluated by CCSF because the communities in the vicinity of Hunters Point Substation have borne and continue to bear the impacts from substantial industrial activity, most notably the Hunters Point Power Plant and the SEWPCP itself. In addition there are potential land use impacts associated with nearby residences. Thus CCSF did not consider siting new City-sponsored generation in the Hunters Point area (SFERP 2004a and SFPUC 2005a). The Cargo Way site is located less than 0.25 miles north of Hunters Boulevard and would encounter significant environmental justice concerns. In addition, this site would not reduce impacts of the proposed SFERP project in any issue areas other than cultural resources, without creating new potentially significant impacts of its own.

Gilman Avenue, 3Com Park Area

This site was also evaluated by Energy Commission staff as an alternative for the Potrero Unit 7 Project.

Alternative Description

The site is located immediately east of Arelious Walker Drive and north of Gilman Avenue in San Francisco. This site is currently vacant, and is used as a parking lot for events at 3Com Park. However, the future use of 3Com Park for major events (e.g., SF 49ers football) is in question, and closure of the Park would eliminate the need for use of this site for parking. East of this site is undeveloped park property owned by the State of California (CEC 2002a).

This site is located in a sub area of the South Bayshore Area Plan of the San Francisco Master Plan. This sub area is depicted by the Area Plan as strategic in improving land use quality and housing growth and to stimulate long term economic and employment growth in the perimeter of the Candlestick Point State Recreation Area. CCSF's General Plan identifies this site as a potential future park. This site and most of the surrounding lands are currently zoned M-1 (Light Industrial). However, with the Candlestick Point State Recreation Area and the existing residential neighborhood as the primary adjacent uses, this area is becoming less suitable for industry and more suitable in the long term for housing or live-work use (South Bayshore Area Plan, July 1995).

According to the South Bayshore Area Plan (July 1995), the M-1 zoning class prohibits manufacture, refining, distillation of abrasives, acid, alcohol, asbestos and similar hazardous chemicals as well as other heavy industries. This prohibition should be maintained to assure that these areas are adequately protected and insulated from the adverse impacts of toxic industries (CEC 2002a).

The 115 kV transmission system is less than one mile to the west, and a transmission interconnection to that line would be required. It is assumed that this connection would be underground, following a route generally due west to the Third Street corridor. Water would be obtained from the SEWPCP just one block west of the Third Street corridor at Jerrold Street, less than 2 miles north-northwest of the site. Natural gas is available in proximity to the site.

To the east of the site are the Candlestick RV Park and Candlestick Point State Recreation Area. To the south is 3Com Park with elevated residential areas on the hill slopes to the west of the park. To the immediate west of the site is a gated residential area (Alice Griffith Housing Project) under the jurisdiction of the San Francisco Housing Authority and zoned for moderate density residential uses. To the immediate north of the site are Bay wetlands and more residential areas on the southern slopes of Hunters Point. The True Hope Church of God in Christ, the Bret Harte School, and Gilman Park are also located near the site on Gilman Avenue between Hawes Street and Giants Drive. Gilman Park includes playing fields and playground facilities (CEC 2002a).

Rationale for Elimination

CCSF seeks to continue to develop this area with a mixture of housing types, including middle, moderate, and low-income housing that is reflective of the demographic

character of the South Bayshore area. Given that CCSF seeks to avoid heavy industrial uses in this area, and the existence of several sensitive land uses (i.e., residences, schools, playgrounds, churches, recreation area, etc.) surrounding the site, project development at this site would be less desirable than at the SFERP site. Development of power generating facilities would not be consistent with CCSF's light industrial designation and would be incompatible with the surrounding residential and recreational uses and the associated sensitive receptors. In addition, development at this site could raise environmental justice issues. The Alice Griffith Housing Project, a low-income housing land use, is in close proximity to this site and could be disproportionately impacted by the adverse air quality, noise, and hazardous materials impacts of the proposed project. Therefore, this alternative was eliminated from full analysis.

East Jamie Court, South San Francisco

This alternative site was under consideration for a power plant by AES Corporation in 1998-1999, but an AFC was not submitted to the Energy Commission at that time. According to Steve Carlson, planner with the City of South San Francisco, the Jamie Court site is one of three potential sites in the South San Francisco area that have been under consideration for a power plant at various times between 1999 and during the alternatives screening process for the Potrero Unit 7 Project where it was evaluated as an alternative in 2002 (CEC 2002a). Besides Jamie Court, the other South San Francisco sites were: (1) adjacent to the water treatment plant (eliminated from this analysis due to its small size), and (2) at the San Francisco Airport (evaluated in this Staff Assessment as the SFIA Alternative).

Alternative Description

This site is south of East Jamie Court and east of Haskins Way, south of E. Grand Avenue, adjacent to the CCSF's recycling facility, on the Oyster Point peninsula near Point San Bruno that is due north of SFIA. The site is located directly on the San Francisco Bay (the San Bruno Channel passes adjacent to this shoreline). The site is a vacant lot of about 20 acres (CEC 2002a).

According to the South San Francisco General Plan this site is within an area designated as Mixed Industrial and Coastal Commercial with a 161-foot height limit for structures according to the General Plan's Airport Related Height Limitations. The Mixed Industrial designation is intended to provide and protect industrial lands for a wide range of manufacturing, industrial processing, general service, warehousing, storage and distribution, and service commercial uses. Industries producing substantial amounts of hazardous waste or odor and other pollutants are not permitted under the Mixed Industrial designation. The Coastal Commercial designation allows for a variety of office, limited retail and other low-scale commercial uses with a coastal orientation (CEC 2002a). There are no residences in the immediate vicinity.

The transmission system is approximately 1.3 miles to the west, so construction of an interconnection would be required. Natural gas would be supplied from Line 101 near the Highway 101 corridor.

Rationale for Elimination

This alternative would be south of Martin Substation and would therefore not fulfill the reliability siting objective of CCSF based on CA ISO analysis to ensure the closure of Hunters Point Power Plant (SFERP 2004q). Regardless, a similar site in the vicinity, the SFIA Alternative, was fully evaluated in this Staff Assessment. The SFIA Alternative was chosen for full evaluation because it was found to be preferable to the East Jamie Court site due to of better access to infrastructure (i.e., transmission, water, and natural gas). The East Jamie Court site would have had similar impacts, but would have also required substantially longer linear routes for transmission, water, and natural gas, creating greater environmental impacts.

Potrero Power Plant Unit 7 Project FSA Alternatives

In the FSA for the Potrero Power Plant Unit 7, Staff identified and considered a broad range of potential alternatives to the proposed project in selecting those that qualified for detailed evaluation. The alternatives identified and considered were:

- No Project Alternative
- Five alternative sites (Cargo Way, Tuntex [Brisbane], Gilman Avenue [3Com Park Area], East Jamie Court [South San Francisco], UGG [SFIA])

Other alternatives that were eliminated from detailed consideration in that FSA were:

- Transmission alternatives
- Technology alternatives
- Demand side management
- Distributed generation
- Renewable resources (solar, wind, biomass, hydropower, geothermal)
- Integrated resources alternative.

Several of the sites evaluated in the Potrero Power Plant FSA are addressed above. The following four additional alternative sites beyond those addressed above were addressed (but not evaluated in detail):

- **City Asphalt Plant:** This asphalt preparation facility is located at the corner of Quint and Jerrold Streets in the Bayview-Hunters Point neighborhood, near the SEWPCP. The site is small and triangular-shaped (adjacent to the railroad) and was eliminated from initial screening because, with residential neighborhoods only two to three blocks away to the east, it would not reduce or eliminate any impacts of the proposed project. This site was also considered for the SFEC project, but rejected at the time due to nearby residences and inconsistency with zoning regulations (it is zoned P, public district, limiting uses to governmental services or uses permitted in any NC, neighborhood-commercial zone, within a quarter mile of the subject parcel) (CEC 1995).
- **Carroll Avenue, North of 3Com Park:** This site is currently used as a parking lot for events at 3Com Park, and is located at the east end of Carroll Avenue adjacent to State Park lands. The vacant lot may become less used as events at 3Com Park

are discontinued. However, this site was eliminated because there are residential properties located less than one block away, to the south.

- **South San Francisco, Belle Air Road:** This site is within an industrial area of the City of South San Francisco, east of the 101 Freeway and north of North Access Road near SFIA. The land is used primarily for the City's water treatment facilities, and only a small area would be available for use as a power plant. Therefore the site was eliminated from analysis as an alternative to Potrero Unit 7 due to feasibility concerns and was not considered for SFERP because it is in the same vicinity as the SFIA Alternative but would have greater impacts.
- **3Com Park:** Since the stadium itself may become obsolete in the future, its location was considered for a power plant site. However, because the timing of the potential discontinued use is not certain, there are residences to the north and west. In addition, parklands surround the site. As a result, the site was eliminated from consideration.

San Francisco Energy Company FSA Alternatives

For the Energy Commission's analysis of the San Francisco Energy Company's (SFEC) Project (94-AFC-1), staff initially surveyed approximately 150 sites on the northern San Francisco peninsula and within CCSF. Most were eliminated because of land use incompatibility and the land requirements (a single city block with at least 3 acres). The most promising alternatives that resulted from the SFEC analysis are listed below, along with their rationale for elimination. **ALTERNATIVES Table 7** (following the list) presents a summary of SFEC alternatives (CEC 1995).

- **Port Site:** Proposed site for the SFEC Project (see Cargo Way Site, above), near the Islais Creek Channel and Piers 90 and 92. The Port Site's immediate neighbors were industrial and commercial. However, applicant and the Port were unable to agree on the terms of a lease for this site, therefore, it was never built.
- **Innes Avenue Site:** While SFEC was unable to lease the Port Site, this nearby, privately-owned parcel could have been leased. Located at Innes Avenue, south of India Basin, this site was directly adjacent to a residential neighborhood. SFEC still hoped to lease the Port Site, but felt it had to achieve site control under the Biennial Resource Plan Update (BRPU). The SFEC AFC was thus filed with the facility located at either the Innes Avenue Site or the Port Site. The AFC designated Innes Avenue as "the proposed site" and the Port Site as "the alternative site." Based upon the potential for significant adverse environmental impacts due to the proximity of residences, the Innes Avenue site was found to be greatly inferior to the Port Site (CEC 1995).
- **City Asphalt Plant:** See Potrero Unit 7 Alternatives above.
- **SF Thermal Plant:** See Potrero Unit 7 Alternatives above and the Jessie Alternative under Alternatives Eliminated.
- **Hunters Point Power Plant:** See discussion of sites near Hunters Point Substation in the Alternatives Analysis Completed by the Applicant section above.
- **China Basin Stadium Site:** Immediately south of Southern Pacific Terminal (Caltrain station) bounded by I-280 off ramp and Caltrain at 4th and Berry Streets. A

cogeneration plant was found to be incompatible with the retail and general commercial uses in the immediate vicinity of the site. In addition, because of its proximity to the Caltrain terminal, it could supplant uses, such as office, commercial, and light industrial, that would be more able to take advantage of the proximity to the transit option that the passenger terminal represents. In addition, at the time Caltrans was planning the terminus of the off ramps for I-280 to be on the site.

- **Mission Bay Development:** Bounded on the east by 3rd and the south by 16th Street. To the north and west is the China Basin estuary. Initial analysis at the time indicated that a cogeneration plant would not be compatible with the development plans approved by the City and being implemented by the property owner, Catellus Corporation. While it would be consistent with zoning and height standards, construction of a power plant at this site would have negated years of planning intended to convert this area, formerly rail yards, into a community of residential and commercial uses. Changes to the plan would have required amendments to the Mission Bay specific plan and, hence, the City and County Master Plan (CEC 1995).
- **Rail Yard South of China Basin:** An old Santa Fe rail yard south of China Basin and north of Central Basin. Illinois Street is on the south and Terry Francois Street (also known as China Basin Street) is on the east. This parcel is within the jurisdiction boundaries of the Port of San Francisco and identified in the San Francisco Bay Plan and Waterfront Special Area Plan as reserved for Port priority, or maritime uses. Therefore, this site was eliminated from consideration for SFEC.
- **Cow Palace Site, Daly City:** This site is located on the Cow Palace grounds, an exhibition facility, less than 0.5 miles from Martin Substation. It was eliminated by the SFEC because it was found by the applicant to have poor access to cooling water and natural gas supply constraints. The applicant also stated in their AFC that the site size and configuration would make facility design difficult and zoning changes would be required.
- **Cow Palace Basin:** On the northeast corner of Carter and Martin Streets in Daly City is a deep canyon, which bounds the southwest corner of the Cow Palace Site, behind the old Geneva Drive-In to the west. If graded, there would be approximately 7 acres available for this site. The site is zoned C-3, Heavy Commercial, and land uses in the vicinity are primarily non-industrial. A power plant at this location would be inconsistent with the land use limitations imposed by the C-3 zoning designation and would be highly visible. In addition, the area surrounding the site is a developing residential area.
- **Treasure Island** The rationale for elimination is discussed for the Treasure Island Alternative under Alternatives Eliminated.
- **Hunters Point Naval Shipyard:** South end of Innes or Crisp Avenue. This site was eliminated for the SFEC because a preferred land use alternative was developed and was under review at the time that emphasized low intensity and light industrial uses. The shipyard property was also highly contaminated and undergoing a remediation process.
- **PG&E's H. Martin Substation, Daly City:** This site is located on the southwest corner of Geneva Avenue and Bayshore Boulevard in the far eastern portion of the Daly City panhandle in the Bayshore community planning area. It is designated in

the Daly City General Plan as PU, Public Utility, and most of the site is occupied by PG&E's Martin substation. In addition, the site is in close proximity to numerous single-family residences, an elementary school, and a community park to the south and west of the site.

- **Tuntex Site:** This site is considered as an alternative to Potrero Unit 7 Project and herein as the Brisbane Alternative. It is part of a larger vacant parcel located between Bayshore Boulevard to the west and Highway 101. It was eliminated from SFEC because public infrastructure (i.e., water, sewer, access, etc.) was nonexistent and because the Brisbane General Plan designated the area PD/TC, Trade Commercial Planned Unit Development, which would not support the location of heavy industrial uses in the area.
- **Potrero Site:** Bordered by Humboldt Street (north), 23rd Street (south), Illinois Street (west), and Potrero Point (east). The 540 MW combined cycle Potrero Unit 7 Project, which is considered as an alternative in this Staff Assessment, is located on this site. This alternative site was found to be less compatible with existing and future uses than the SFEC proposed site, because the parcel was closer to active maritime uses existing to the south at the terminus of Army Street and was more likely to be influenced by its port priority use designation and be used for maritime uses.
- **SF Airport Site:** This site was considered as an alternative to Potrero Unit 7 and is also evaluated herein as the SFIA Alternative. No specific site was identified during the SFEC environmental review process but it generally referred to the industrial area east of Highway 101 and north of the main airport terminal. The airport site was less preferred because expanded operations at the airport as illustrated in the Airport Master Plan would have required subsequent expansion and intensification of aviation support services in the vicinity of the airport. Lands used by the SFEC could have displaced necessary airport-related uses. In addition, land uses within and near the runway approach zones are subject to federally mandated height limitations that would preclude construction of a cogeneration plant in a number of locations in this area.
- **Catellus/Port Authority Site (also known as Western Pacific Site):** This site was considered by the applicant in the SFERP AFC. This site is located at 25th Street between Illinois and Michigan Streets. Energy Commission staff fully analyzed this site for the SFEC project and found it to be feasible. At the time to parcel was involved in a transfer of ownership to the Port of San Francisco.

Intervenors for the SFEC project also suggested consideration of other sites, which were deemed infeasible:

- **The Presidio:** See description under Alternatives Eliminated (Appendix B).
- **Alcatraz Island:** As part of the Golden Gate National Recreation Area, Alcatraz Island is under the administration of the National Park Service and was found to be regulatorily infeasible. Space concerns as well as significant environmental impacts were identified, specifically to visual, cultural, and biological resources.
- **Oceanside Water Pollution Control Plant:** adjacent to U.S. National Guard Armory and SF Fleishacker Playground and Zoo, bordered by Great Highway to the

west and Sloat Blvd to the north. It was eliminated from analysis because the site had been approved to house the zoo's mammal conservation center and an avian conservation center and, therefore, would be an incompatible land use and would preclude future recreational use.

- **Vacant lot on Sloat Boulevard.** Since it was smaller than 3 acres, this site, located at 2900 Sloat Boulevard, had space constraints. In addition, land use in the area is primarily residential with light commercial intermixed along Sloat Boulevard, and there was a planned residential development for 16 buildings and 33 dwellings underway at the time, which has since constructed.

ALTERNATIVES Table 7. Alternative Sites Considered in the San Francisco Energy Company (SFEC) FSA (94-AFC-1)		
Alternatives	Qualify ?	If Not, Why Not?
Innes Avenue	No	No environmental benefit (proximity of residences)
City Asphalt Plant	No	Too small for 540 MW
SF Thermal Plant	No	Too small for 540 MW
Hunters Point Power Plant	No	No environmental benefit
China Basin Stadium Site	No	Unavailable due to Mission Bay development underway
Mission Bay Development	No	Unavailable due to Mission Bay development underway
Rail Yard South of China Basin	No	Unavailable due to Mission Bay development underway
Cow Palace, Daly City	No	No environmental benefit (residential developments now surround available land)
Treasure Island	No	Inadequate infrastructure (transmission lines, natural gas) and geotechnical concerns related to building on fill
Hunters Point Naval Shipyard	No	Development plans underway for residential and other uses
PG&E's Martin Substation, Daly City	No	Inadequate land available
Tuntex Site	Yes	Considered herein as the Brisbane Alternative
Potrero Site	Yes	Considered herein as the Potrero Unit 7 Project alternative.
SF Airport Site	Yes	Considered herein as the SFIA Alternative
Catellus/Port Authority Site	No	Similar to site of proposed SFERP, but no environmental benefit (land use conflicts and regulatory feasibility issues)
Oceanside Water Pollution Control Plant	No	Incompatible land use with the SF Zoo and would preclude future recreational use

TRANSMISSION ALTERNATIVES

Two transmission alternatives (San Mateo-Martin and several similar East Bay to SF options) were considered in the San Francisco Long-Term Electric Transmission Planning Technical Study, October 24, 2000 (the study that ultimately recommended the

Jefferson-Martin Project). These same alternatives are also being considered in the San Francisco Peninsula Long-Term Transmission Planning Study, Phase 2 Study Plan, Version 3.0 (April 1, 2004). The other two projects (Jefferson-Martin and the Trans Bay Cable) are addressed elsewhere in this Staff Assessment, so are only briefly summarized here.

Jefferson-Martin 230 kV Transmission Project. This transmission alternative could be considered to be an alternative to the SFERP. It is included in the Revised San Francisco Action Plan (see **ALTERNATIVES Table 5**) as one of the nine necessary projects to release HPPP Units 1 & 4 from their RMR Agreements, but it would *not* release Potrero Unit 3 from its RMR Agreement, which is a major objective of the proposed SFERP (Edwards 2004a and 2004b). This project was approved by the CPUC on August 19, 2004. Construction is currently underway and the line should be operational by summer 2006. This project does in part meet the objectives of the SFERP: it will improve the City of San Francisco's electricity reliability; it will help to facilitate the shutdown of HPPP, and it creates no local impacts from electrical generation. However, given that this project has already been approved, it is considered in this analysis as part of the No Project Alternative.

Trans Bay Cable Project. This project would result in installation of a DC cable from Pittsburg (Contra Costa County) to the Potrero Substation. It is fully evaluated as an alternative to the SFERP (see Appendix A, Alternatives Evaluated in Detail).

San Mateo Substation to Martin Substation

Alternative Description

This alternative would consist of a new 14.3-mile 230 kV underground cable constructed between San Mateo and Martin Substations in the Cities of San Mateo, Burlingame, Millbrae, San Bruno, South San Francisco, and Brisbane. The routing of this alternative as suggested in the CA ISO Study would be in the same ROW as the existing underground 230 kV transmission line between San Mateo and Martin Substations.

This alternative would require internal transmission reinforcement and reactive support. Martin Substation is an outdoor 230/115kV transmission substation that has property available for substation facilities expansion.

The alternative would follow the existing 230 kV underground route, departing northward out of San Mateo Substation and heading across the Coyote Point Recreation Area (across the golf course) to the Highway 101 corridor. The route would roughly parallel Highway 101 along Airport Boulevard/Old Bayshore Highway. From the corner of Millbrae Avenue and El Camino Real (State Highway 82), the route heads north in El Camino Real for 1.3 miles. From this intersection to the north, El Camino Real is a major commercial roadway with at least 4 lanes and generally with a center median. The route turns east for two blocks just south of Santa Maria Avenue, and then turns north into San Antonio/Huntington Avenues (the BART ROW) for approximately 1.3 miles. Land uses along Huntington are residential and light industrial.

Immediately south of I-380, this route would turn east, cross under the freeway, and turn immediately north in Herman Street, which is a wide roadway with a railroad corridor to

the east and residential land uses to the west. After 0.6 miles in Herman Street, the route turns into Linden Avenue for 0.9 miles, traveling into central South San Francisco. Linden Avenue is fairly wide with mostly industrial and commercial enterprises along the roadway and some residences around Village Avenue. On Linden, the route would have to be bored below a railroad crossing (at Railroad Avenue) and a canal, crossing Linden at Canal Street. The route turns east on Baden Avenue for one block, then north into Bayshore Boulevard.

The alternative route would follow the existing 230 kV underground line in Bayshore Boulevard for 4.0 miles, around the east side of San Bruno Mountain to the east to Martin Substation. Bayshore Boulevard is mostly light industrial with several scattered residences west of the road around San Bruno Mountain. There is ongoing construction along Bayshore at the South San Francisco Highway 101 off-ramp that constricts Bayshore to a single lane, but aside from that temporary construction, Bayshore Boulevard is generally wide and well used (CPUC 2003).

Rationale for Elimination

Currently the San Mateo Substation is essentially the only source of externally generated power to the CCSF and northern San Mateo County. With this alternative, if there were a loss of 230 kV power at the San Mateo Substation, the CCSF would lose nearly all of its ability to import power.

The major feasibility concern related to this alternative is availability of adequate space within the city streets, given that the existing 230 kV transmission line is already located there and there are also other underground utilities. The proposed new underground transmission line would need to be separated from PG&E's existing underground line by at least 10 feet (preferably 15 feet) in order to prevent the heat generated by each line from affecting the transmission capacity of the other line. There would also be concerns about physically damaging the other utilities during construction. A buffer of at least five feet between the proposed trench and the nearest other utility would be necessary (CPUC 2003).

According to City of San Bruno, Huntington Avenue in the area of the PG&E's existing 230 kV line is one of the area's most tightly packed utility corridors. Utilities in this portion of Huntington Avenue include a 23-inch storm drain, a 16-inch gas pipe, a water line, and a sewer line. These utilities are primarily on the west side of Huntington Boulevard. In addition, there are many other utilities that perpendicularly cross Huntington Avenue. There would be space constraint issues with the addition of another 230 kV line within the road, but it would be feasible. However, there are major space constraints in Linden Avenue and Bayshore/Airport Boulevard through the City of South San Francisco (CPUC 2003).

Moraga or Sobrante Substation to Potrero Substation

Alternative Description

An approximately 20-mile kV circuit would be constructed connecting the Moraga and Potrero Substations. The route would utilize an existing transmission corridor from Moraga Substation to Claremont Substation and would then for the most part utilize a

common corridor from the Claremont Substation, through Oakland, to the east side of the San Francisco Bay. Initiating from Moraga Substation in the City of Orinda in Contra Costa County the line would travel northwest for approximately 1.3 miles before crossing Brookside Road and turning west.

The Sobrante Substation is located east of Bear Creek Road and south of the Briones Dam in the City of Orinda in Contra Costa County, about 4.6 miles north-northwest of the Moraga Substation. The line would travel south from the Sobrante Substation for approximately 3.3 miles and would join the Moraga line just north of Brookside Road in the City of Orinda. From that point the route would turn west and would be identical to the Moraga alternatives mentioned above.

From their joining point, the overhead line would continue in unincorporated Contra Costa County, Robert Sibley Volcanic Regional Preserve, part of the East Bay Regional Park District (EBRPD), and the City of Oakland in Alameda County where it would transition underground at Claremont Substation. From Claremont Substation, the underground line would continue through urbanized areas in the City of Oakland to the eastern edge of the San Francisco Bay.

There are four options for bringing the transmission line across the San Francisco Bay: (a) run the cable through the BART service tunnel (between the two tunnels for the eastbound and westbound trains); (b) hang the cables from the Bay Bridge (new bridge in east half; existing bridge in west half); (c) lay a new submarine cable; or (d) use a combination of hanging on the Bay Bridge and a submarine cable.

Within the CCSF after the Bay crossing, assuming a landing south of I-80, the route could travel south along The Embarcadero, turn west onto King Street, then southwest onto 3rd Street where it would pass through the Mission Bay development. The route would turn south onto Illinois Street and follow it to the Potrero Substation at the corner of 23rd Street. Land use along the transmission line route within the CCSF would be primarily industrial and commercial.

The use of HVDC Light™ technology⁷ for the Moraga to Potrero route (330 MW or 540 MW) has been informally proposed by Sea Breeze Pacific Regional Transmission System, Inc. and the concept is in the beginning stages of discussion at the CAISO San Francisco Stakeholders Study Group as of July 26, 2005. The Sea Breeze proponents have requested that the CAISO delay approval of the Trans Bay Cable to allow consideration of this competing project. However, it is too early in the planning stages for the Sea Breeze project to be considered as a viable alternative for SFERP within the project timeframe.

Rationale for Elimination

Any cross-bay transmission alternative originating at the Moraga or Sobrante Substations would require construction of 4.7 miles of overhead transmission line through the City of Orinda and East Bay Hills (open space east of Oakland where a

⁷ HVDC Light™ was developed by ABB Power Technologies AB as a transmission technology based on voltage source converters (VSCs) and insulated gate bipolar transistors (IGBTs) linked together by underground/undersea cables. HVDC Light™ can operate at low short circuit power levels thereby extending the economical power range of HVDC transmission down to just a few MW. It also improves the stability and reactive power control at each end of the network and connects more easily into the AC system than the Conventional HVDC. Although HVDC Light™ was originally developed in 1997, it has only been within the past year that the technology has been developed for capacities over 330 MW (for more information on HVDC Light™, see <http://www.abb.com/hvdc>).

wide range of wildlife species and special status plants would be affected). The route would pass through Robert Sibley Volcanic Regional Preserve, one of the EBRPD's original parks, for approximately 0.9 miles. Sibley Volcanic Preserve's main entrance is on Skyline Boulevard just east of the intersection with Grizzly Peak Boulevard in the Oakland hills.

Round Top, a peak within Sibley preserve approximately 0.5 miles south of the transmission line route is one of the highest peaks in the Oakland hills and provides an unsurpassed outdoor laboratory for the study of volcanism in the Central Coast Ranges. Volcanic dikes, mudflows, lava flows, and other evidence of the extinct volcanoes are visible throughout the park's 660 acres. There are also vistas of Mt. Diablo and the hills of Las Trampas, and beautiful displays of wildflowers in season. This alternative would pass through the park, widening the existing ROW, which already contains three transmission lines so incremental additional impacts would be created. The route would also cross a Bay Area Ridge Trail within the EBRPD. Large towers and transmission lines could biologically, geologically, recreationally, and visually affect this important preserve area. There may be public concerns about upgrading the existing 115 kV corridor to a 230 kV corridor, especially regarding EMF.

One segment of the overhead line would pass adjacent to residences: on Broadway Terrace in the City of Oakland for approximately 0.2 miles. The line would transition to underground at PG&E's existing Claremont Substation. South of the Claremont Substation, there would be an additional 9.2 miles of underground construction in Oakland, passing through industrial, commercial, and some residential areas. The underground construction through Oakland would have very similar types of impacts to those of the SFERP's short underground transmission line segment. However, approximately 8.6 miles of the Oakland underground route are through industrial and commercial land uses, with approximately 0.6 miles in residential areas on Peralta Street, Claremont Avenue, and Forest Street.

While there are several options for crossing the Bay, the specific technology of the bay crossing has not been defined. There would be marine impacts resulting from installation of a submarine cable. There is also reliability risk to submarine cables from ship anchors and dredging activities, so the line would have to be buried well below dredging depths. Beyond navigation and dredging concerns of the USACE, there would be biological concerns with construction impacts to essential fish habitat. Most of the route of the proposed transmission line is in an area that is regularly disturbed by dredging so marine impacts in that area are not of major concern, but at both the east and west Bay margins, there could be significant biological effects, especially in areas of eel grass. There could also be cultural resources issues associated with shipwrecks and the closer proximity to the Bay increases chance of significant resources. Use of the BART tunnel for a bay crossing would not affect the resources of the San Francisco Bay.

A submarine crossing of the bay would require a permit from the BCDC for compliance with the McAteer-Petris Act and the San Francisco Bay Plan. This permit could be granted only if upland alternatives were not available, so as an alternative to a power plant, BCDC permitting may not be attainable.

In order for the Bay Bridge to be used to support a transmission line, the crossing would require that Caltrans grant an exception to its policy prohibiting longitudinal encroachment within its rights-of way, which is very unlikely. The timeline and coordination with the Bay Bridge Retrofit Project could also conflict with this project. If the transmission line is placed on the existing bridge now, there will be problems when the eastern span replacement project (now under construction) is completed in the future.

The BART tunnel Bay-crossing option would also be considered infeasible due to limited space available in the BART service tunnel, heat generation by the 230 kV cables, and BART worker safety concerns.

RENEWABLE RESOURCE ALTERNATIVES

Aggressive efforts are now being made to increase the renewable resource component of California's generation supply. In the year 2002, California had over 7,000 MW of renewable energy capacity, including solid-fuel biomass, geothermal, wind, small hydroelectric (30 MW or less), concentrating solar power (CSP), photovoltaic systems (PV), landfill gas, digester gas, and municipal solid waste (MSW) facilities (CEC 2003b). These facilities produced about 28,900 GWh in 2002, about 11 percent of the electricity used in California (CEC 2003b). This section considers the principal renewable electricity generation technologies that could serve as alternatives to the SFERP. These technologies are wind, solar, tidal, wave, geothermal, and biomass energy. The technologies are attractive from an environmental perspective because of the absence or reduced level of air pollutant emissions. However, these technologies also have environmental consequences, feasibility problems, and they may not meet the objectives of the SFERP.

Renewable Portfolio Standard Program. The Energy Commission, in collaboration with the California Public Utilities Commission (CPUC), has initiated a proceeding to implement the State's Renewable Portfolio Standard Program as mandated by Senate Bill 1078 (SB 1078, Sher, Chapter 516, Statutes of 2002) under Public Utilities Code sections 381, 383.5, 399.11 through 399.15, and 445. California's Renewable Portfolio Standard (RPS) requires retail sellers of electricity to increase their procurement of eligible renewable energy resources by at least 1 percent per year so that 20 percent of their retail sales are procured from eligible renewable energy resources by 2017. The RPS legislation requires that the CPUC and Energy Commission work collaboratively to implement the RPS and assigns specific roles to each agency. Pursuant to SB 1078, the Energy Commission's responsibilities include:

- Certifying eligible renewable resources that meet criteria contained in the bill, including those generating out-of-state
- Designing and implementing a tracking and verification system to ensure that renewable energy output is counted only once for the purpose of the RPS and for verifying retail product claims in California or other states
- Allocating and awarding supplemental energy payments as specified in SB 1038 to eligible renewable energy resources to cover above-market costs of renewable energy.

As a part of this process, the Energy Commission formally adopted *Renewable Portfolio Standard Guidelines* on February 19, 2003, pursuant to Public Utilities Code section

383.5, subdivision (h), and subsequently revised pursuant to this authority and Public Resources Code section 25747 (a) on April 21, 2004, and May 19, 2004. These *Guidelines* were adopted to govern the Renewable Energy Program and its various program elements under SB 1038 and SB 1078, to assist interested applicants in applying for Program funds and RPS certification, and for verifying RPS compliance. The *Guidelines* are divided into six separate documents including:

- Overall Program Guidebook
- Existing Renewable Facilities Program Guidebook
- Emerging Renewable Program Guidebook
- Renewable Resource Consumer Education Guidebook
- New Renewable Facilities Program Guidebook
- Renewables Portfolio Standard Eligibility Guidebook

The CPUC is addressing its responsibilities in implementing the RPS through a separate proceeding titled, Order Instituting Rulemaking to Establish Policies and Cost Recovery Mechanisms for Generation Procurement and Renewable Resource Development (R. 01-10-24). The CPUC's responsibilities include:

- Establishing a process to determine market price referents, setting the criteria for IOU ranking of renewable bids by least cost and best fit, and establishing flexible compliance rules, penalty mechanisms and standard contract terms and conditions
- Establishing initial renewable generation baselines for each IOU, making subsequent changes to these baselines as needed, and determining annual procurement targets
- Directing the IOUs to develop procurement plans, and approving, amending or rejecting the plans
- Making specific determinations of market price referents for products under contract
- Approving or rejecting IOU requests to enter specific contracts for renewable power, including determining if a solicitation was adequately competitive
- Factoring transmission and imbalance costs into the RPS process and identifying the transmission grid implications of renewable development
- Defining rules for the participation of renewable Distributed Generation (DG), Electric Service Providers (ESP), Community Choice Aggregators (CCA), and potential Procurement Entities.

The CPUC and the Energy Commission have developed a schedule for addressing RPS issues, and have established guidelines for how the two agencies work collaboratively on the RPS. The schedule and collaborative process are described in the Energy Commission's Committee Order on RPS Proceeding and CPUC's Collaborative Guidelines. The Order also describes administrative procedures for interested parties who wish to participate in the Energy Commission's RPS proceeding.

San Francisco Electricity Resource Plan. The Electricity Resource Plan, a joint effort by the SFPUC and San Francisco's Department of the Environment, proposes a plan to avoid future energy crises through energy efficiency, new cleaner generation and imported power, and provides a framework for shifting San Francisco's dependence on

fossil-fuel burning power plants to clean, renewable forms of energy. The Board of Supervisors in the May 2001 "Maxwell Ordinance" entitled "Human Health and Environmental Protections for New Electric Generation" directed the agencies to produce the Plan. Mayor Willie Brown signed the Plan in December 2002 (SF Environment 2002).

The purpose of the Plan is to show how CCSF can meet its future electricity by building cleaner in-City generation, implementing aggressive energy efficiency and peak load management, as well as supporting completion of planned transmission upgrades. At the same time, the Plan assumes that PG&E's Hunters Point Power Plant and Mirant's Potrero Power Plant Unit 3 can be shut down, and that CCSF will require no new large-scale central electricity generation.

Before drafting the Plan, SF Environment and SFPUC held numerous public meetings in neighborhoods across CCSF to identify resident and business community priorities. Major concerns include reliability, efficiency, affordability, and the reduction of harmful emissions associated with the production of electricity. In answer to these concerns, the plan provides a means to shut down Hunters Point Power Plant, and reduce operation at the existing plant on Potrero Hill by releasing them from their RMR Agreements with the CA ISO. This will be accomplished by developing sufficient replacement power through a combination of aggressive energy efficiency and conservation programs, and by building new renewable and cleaner, smaller scale fossil fuel generation.

Some of the renewable projects proposed in the Plan included a football field-sized solar photovoltaic system at the new Moscone Center (operational since March 2004), and a second solar installation planned for the SEWPCP. The Plan also addresses the potential for wind turbines to be placed outside CCSF in the Altamont Pass, and tidal current and wave generation could be developed in cooperation with other municipalities at various locations in the Bay. Other proposed municipal sites for development of renewable power projects include the airport and the port.

CCSF also has a 2 MW cogeneration plant at the SEWPCP that uses waste gas from the plant to process heat and produce energy. The plant is currently inactive because a new gas clean-up system needs to be installed before the plant can reopen (Doyle 2005).

Wind Technology

Alternative Description

Wind carries kinetic energy that can be utilized to spin the blades of a wind turbine rotor and an electrical generator, which then feeds alternating current (AC) into the utility grid. Most state-of-the-art wind turbines operating today convert 35 to 40 percent of the wind's kinetic energy into electricity. A single 1.5 MW turbine operating at a 40 percent capacity factor generates 2,100 MWh annually. Modern wind turbines represent viable alternatives to large bulk power fossil power plants as well as small-scale distributed systems. Wind turbines being manufactured now have power ratings ranging from 250 watts to 1.8 MW, and units larger than 4 MW in capacity are now under development (AWEA 2004). The average capacity of wind turbines today is 750 kW (CEC 2004 - Comparative Study of Transmission Alternatives, Background Report).

California was the first U.S. state in which large wind farms were developed, beginning in the early 1980's, and the state still leads the nation in wind power generation. However, 16 other states are considered to have greater overall wind generation potential. California currently has an installed capacity of 2,051 MW, and an additional over 300 MW are planned (AWEA 2004).

The perception of wind as an emerging energy source reached a peak in the early 1980s, when wind turbine generators to convert wind power into electricity were being installed in California at a rate of nearly 2,000 per year. Progress slowed a few years later, however, as startup tax subsidies disappeared and experience demonstrated some deficiencies in design. At the present time, technological progress again has caught up, contributing lower cost, greater reliability, and reason for genuine optimism for the future (Lamarre, 1992). A major factor has been the inclusion of environmental externalities by electric utilities in their resource planning programs. The more penetrating analysis, which has included these potential costs, has shown wind power to be substantially more economically attractive than was previously thought.

The technology is now well developed, and can be used to generate significant amounts of relatively low-cost power.

Wind turbines can create other environmental impacts, as summarized below (AWEA 2004):

- Erosion can be a concern in certain habitats such as the desert or on mountain ridgelines. Standard engineering practices can be used to reduce erosion potential.
- Birds collide with wind turbines. Avian deaths have become a concern at Altamont Pass in California, which is an area of extensive wind development and also high year-round raptor use.
- Wind energy can negatively impact birds and other wildlife by fragmenting habitat, both through installation and operation of wind turbines themselves and through the roads and power lines that may be needed.
- Bat collisions at wind plants generally tend to be low in number and to involve common species, which are quite numerous. A high number of bat kills at a new wind plant in West Virginia in the fall of 2003 has raised concerns, and the problem of bat mortality at that site is currently under investigation.
- Visual impacts of wind power fields can be significant, and installation in scenic and high traffic areas often results in strong local opposition.
- Noise was an issue with some early wind turbine designs, but it has been largely eliminated as a problem through improved engineering and through appropriate use of setbacks from nearby residences. Aerodynamic noise has been reduced by changing the thickness of the blades' trailing edges and by making machines "upwind" rather than "downwind" so that the wind hits the rotor blades first, then the tower (on downwind designs where the wind hits the tower first, its "shadow" can cause a thumping noise each time a blade passes behind the tower). A small amount of noise is generated by the mechanical components of the turbine.

In open, flat terrain, a utility-scale wind plant would require about 60 acres per MW of installed capacity. However, only 5 percent (3 acres) or less of this area would actually be occupied by turbines, access roads, and other equipment. The remainder could be used for other compatible uses such as farming or ranching. A wind plant located on a ridgeline in hilly terrain will require much less space, as little as two acres per MW (AWEA 2004).

Rationale for Elimination

The large area needed for wind electricity generation would create significant land use, biological, cultural, and visual concerns. In addition, wind turbines would have noise impacts associated with both construction and operation. Wind turbines have been documented to kill large numbers of raptors because these fast-flying birds do not account for movement of the rotating blades.

In addition, there are reliability concerns with wind technology because of the need for a consistent wind source. Extensive wind generation would also require additional transmission to serve areas of high demand. The extensive land required to generate enough electricity to meet demand is not available in the project area.

Wind generation is possible in other locations throughout California. San Francisco could possibly obtain significant amounts of wind power in areas such as the Altamont Pass, where wind speeds are high and other conditions like proximity to transmission can be met. As a result of the Energy Plan, CCSF is currently looking at several sites including those adjacent to its own Bay Area reservoirs. However, because generation is not feasible locally, any power generated would require substantial transmission to import the power to CCSF, which would create greater environmental impacts over a larger area.

Wind technology has the advantage of not requiring the burning of fossil fuels and the resulting environmental and resource impacts associated with natural gas fired power. However, wind has the potential to cause significant land use, biological, cultural resources, and visual impacts.

Solar Technology

Alternative Description

Electricity generation from solar technologies, including both photovoltaic and solar thermal systems, currently totals about 0.3 percent of the state's electricity production (CEC 2004 - Comparative Study of Transmission Alternatives, Background Report). Maximum power output of PV systems closely matches California's peak electrical demands. Currently, there are two types of solar generation available: solar thermal power and photovoltaic (PV) power generation.

Solar thermal power generation uses high temperature solar collectors to convert the sun's radiation into heat energy, which is then used to run steam power systems. Solar thermal is suitable for distributed or centralized generation, but requires far more land than conventional natural gas power plants. Solar parabolic trough systems, for instance, use approximately five acres to generate one megawatt. Although significant improvements have been made in technology advances and cost reductions, additional

research and development is needed for concentrating solar power to be cost-competitive with conventional fossil fuel plants. Solar thermal facilities will likely not come into play until the 2008-2017 timeframe (CEC 2003a).

Photovoltaic (PV) power generation uses special semiconductor panels to directly convert sunlight into electricity. Arrays built from the panels can be mounted on the ground or on buildings, where they can also serve as roofing material. Unless PV systems are constructed as integral parts of buildings, the most efficient PV systems require about four acres of ground area per megawatt of generation.

PV power systems require approximately one acre per 250 kW at 50 percent area coverage and 10 percent system efficiency. Systems up to about 250 kW are often placed on buildings, and are commonly referred to as building-integrated PV or dual use systems. For systems larger than 250 kW, ground-mount installations are more common. Ground-mount sites require environmental impact reviews because in order to achieve power levels comparable to conventional fossil-fueled peaking combustion plants, large areas are required. For a 50 MW system, over 200 acres would be required. This could be achieved as a single system or as a number of smaller systems distributed on building roofs, covered parking structures, or similar "community integrated" deployments (CEC 2004 - Comparative Study of Transmission Alternatives, Background Report).

The use of solar energy in California offers obvious promise as an environmentally preferred resource. However, it is limited by its availability (only during daytime hours) and by the relatively high cost of solar panels. Clouds, fog and shading limit the amount of power that a system produces. The intermittent nature of the power, however, makes PV systems unsuitable for base-load applications. Solar is, however, particularly valuable when used at the local level to reduce peak power usage and to defer distribution infrastructure development.

San Francisco Electricity Resource Plan. This planning effort provides a local example of an aggressive solar energy program. In an effort to address the CCSF electricity issues, the San Francisco Electricity Resource Plan was adopted by the Board of Supervisors and signed by Mayor Willie Brown in December 2002 as a policy guide to be used in proposing and implementing specific actions related to providing electricity to San Francisco. Those actions that require the expenditure of CCSF funds or require compliance with environmental laws will likely require additional analysis and public review. This Plan provides a long-term vision of the CCSF's possible electricity future. Because the Plan extends over a ten-year time horizon, it may need to be adapted and revised to accommodate changing circumstances.

The CCSF in November of 2001 passed a proposition that would provide \$100 million to support solar power and other renewable programs. In addition and discussed earlier, CCSF has prepared an Energy Resource Plan (in accordance with the Maxwell Ordinance⁸) to guide the various energy efforts underway in the City. These programs will result in increased solar (or other renewable) generation within the CCSF. The City has not yet determined the amount of power that might be generated with the \$100

⁸ The Maxwell Ordinance, also titled "Human Health and Environmental Protections for New Electric Generation" was passed by the SF Board of Supervisors in May 2001 and directed the City to prepare the Electricity Resource Plan, setting forth the means by which the City would reduce its reliance on in-City fossil fuel generation (CCSF, 2002).

million investment, nor do they know how long it will take to invest the \$100 million in order to fully implement the program.

CCSF's first large solar power development was at the City's convention center, Moscone Center. With approximately 60,000 square feet of perfectly flat unshaded roof, this football-field sized showpiece has significantly reduced Moscone's purchase of power and provides a solar showplace for visitors from all over the world. The Moscone solar installation generates 674 kW of electricity (SF Visitor 2004). Through the Mayor's Energy Conservation Account (MECA) funding, other current solar projects in development in CCSF include the following sites: Moscone West (300 kW), NorCal Pier 96 (255 kW), Northpoint Water Pollution Control Plant (300 kW), SEWPCP (255 kW), San Francisco General Hospital (500 kW), San Francisco International Airport (500 kW), and at the SFPUC Water Department (500 kW). In addition, 10 other sites (6 schools, 2 public health facilities, and 2 libraries) for a total of 45 kW are in the bidding process as of July 2005 (Doyle 2005).

The SFPUC has also installed radiometers at eleven sites on City buildings and schools to collect data about the availability of sunlight. The variability in solar incidence is based on microclimate and geography, and when cross-referenced with availability of appropriate space, limits the application of solar technologies in some areas of CCSF. To develop a well thought-out strategy of implementation, CCSF needs to understand the resource and develop it where it is most cost effective. If sufficient participation by commercial and residential customers is obtained, 50 MW of solar could be installed in San Francisco. Price of systems is a major consideration in achieving this magnitude of installation. A sustained program to develop solar in San Francisco can help reduce the overall cost of solar technologies.

Rationale for Elimination

Solar generation facilities are attractive because they do not generate air emissions and have relatively low water requirements. However, there are other potential impacts associated with their use. Construction of solar thermal plants can lead to habitat destruction and visual impacts. PV systems can also have negative visual impacts, especially if ground-mounted. Furthermore, PV installations are highly capital intensive and manufacturing of the panels generates some hazardous wastes.

There are reliability concerns with the technology and the need for a consistent solar source. Both solar thermal and PV facilities generate power during peak usage periods since they collect the sun's radiation during daylight hours. However, solar energy technologies cannot provide full-time availability due to the natural intermittent availability of solar resources. Extensive solar generation would also require additional transmission to serve areas of high demand. Therefore, solar generation technology would not meet the project's goal, which is to provide immediate power to meet peaks in demand. The extensive land required to generate electricity entirely from solar sources is not available in San Francisco and transmission would still be required to transport the power in from other areas.

As demonstrated by the Moscone Center 674 kW and \$4.2 million project, solar photovoltaics are technically feasible and California clearly has a climate where this technology would be useful (Vote Solar 2005). However, the cost of these systems

currently prohibits their widespread use. Solar generation is a feasible technology on a small scale, but it cannot reliably generate 145 MW of power, as required for the SFERP Project.

Given the project objective of providing reliable electric power to the CCSF in the near term, this technology is not considered to be a feasible project alternative. Therefore, this alternative was eliminated from further consideration.

Tidal Technology

Alternative Description

The San Francisco Board of Supervisors approved a resolution on May 6, 2003 for a pilot project to explore using tides to make electricity. The board asked CCSF's Department of the Environment to head the project. The project, approved unanimously by the City's Board of Supervisors, is part of San Francisco's efforts to pursue nonpolluting energy (see above description of the Energy Resource Plan). The pilot project in San Francisco would be the first working project in the United States to test tidal power. This effort stems from California's recent energy shortages and the City's plan to decommission HPPP.

The initial project goal was to create one megawatt of renewable tidal energy, but the project has been scaled back to 150 kW. The details to be worked out are funding, which has led to project delays, and where along the bay or ocean shoreline the power project should be built. The supervisors also asked Marin County and the cities of Richmond and Vallejo to participate in a regional task force that will look at creating other tidal energy projects in the Bay Area.

Each day, nearly 400 billion gallons of water pass through the mouth of San Francisco Bay under the Golden Gate Bridge, which has been estimated by IEEE Power Engineering Society to be enough to generate an estimated 2,500 MW (more than twice the City's peak power demand) with a conservative 3-knot average tidal current (IEEE 2005). If harnessed, the energy from this water could be an answer to the CCSF's power needs (Llanos 2003). The system would not impact shipping since it would be far below the surface, probably on the sea floor itself. The cost of building a 1,000 MW system is estimated at \$600 million, but San Francisco's Environment Department estimates that over 30 years, costs would average out to 6 cents per kilowatt-hour—about the same as natural gas and less than what San Franciscans now pay for power (Llanos 2003). Within 10 years, San Francisco could build enough clean tidal power to meet its daily energy needs, as well as generate surplus energy to sell—all with a price tag of about one-third the cost per megawatt of solar power.

A major drawback of tidal power stations is that they can only generate when the tide is flowing in or out. However, unlike the sun and wind, tidal current is consistent and predictable, so regulators can plan to have other power stations generating at those times when the tidal station is out of action. Overall, tidal generators could produce electricity up to 16 hours a day.

Background

The oldest technology to harness tidal power for the generation of electricity involves building a dam, known as a barrage, across a bay or estuary that has large differences in elevation between high and low tides. Water retained behind a dam at high tide generates a power head sufficient to generate electricity as the tide ebbs and water released from within the dam turns conventional turbines.

Certain coastal regions experience higher tides than others. This is a result of the amplification of tides caused by local geographical features such as bays and inlets. In order to produce practical amounts of power for tidal barrages, a difference between high and low tides of at least five meters is required. There are about 40 sites around the world with this magnitude of tidal range. In Canada, the only practical site for exploiting tidal energy is the Bay of Fundy between New Brunswick and Nova Scotia. The higher the tides, the more electricity can be generated from a given site, and the lower the cost of electricity produced. Worldwide, approximately 3,000 GW of energy is continuously available from the action of tides. Due to the locational constraints, it has been estimated that only 2 percent or 60 GW can potentially be recovered for electricity generation (Baird 1993).

Currently, although the technology required to harness tidal energy is well established, tidal power is expensive, and there is only one major tidal generating station in operation. This is a 240-MW station at the mouth of the La Rance river estuary on the northern coast of France near St. Malo. The La Rance generating station has been in operation since 1966 and has been a very reliable source of electricity for France. La Rance was supposed to be one of many tidal power plants in France, until their nuclear program was greatly expanded in the late 1960's. Elsewhere there is a 20 MW experimental facility at Annapolis Royal in Nova Scotia built in 1984. The smallest tidal plant is located at Kislaya Guba on the White Sea in Russia. It has a 0.5 MW capacity. There are approximately 10 small barrages scattered throughout the world, but they are not intended for commercial power generation. For example, there is a 200-kW tidal barrage on the River Tawe in Swansea Bay, Wales that operates the gates of a lock. China has several tidal barrages of 400 kW or less in size.

Numerous studies have been conducted for large-scale tidal barrages in a variety of locations, but the biggest proposal was for the 8,640-MW Severn Tidal Barrage (STB). A broad range of studies was conducted from 1974 to 1987 on this proposal to dam the Severn Estuary between Wales and England. It has been estimated that the barrage across the Severn River in western England could supply as much as 10 to 12 percent of the country's electricity needs (12 GW). The proposal was shelved in 1987 due to "economic problems," but the proposal would have likely met with fierce opposition from an array of environmental groups and local residents. Similarly, several sites in the Bay of Fundy, Cook Inlet in Alaska, and the White Sea in Russia have been found to have the potential to generate large amounts of electricity.

Despite the success of La Rance, no other major tidal barrages have been built since, due in some part to environmental concerns. Barrages present a barrier to navigation by boats and fish alike; reduced tidal range (difference between high and low water levels) can destroy much of the inter-tidal habitat used by wading birds; and sediment trapped behind the barrage could also reduce the volume of the estuary over time. By

the early 1990s, interest in estuarine-derived tidal power had largely ceased, and scientists and engineers began to look at the potential of tidally-generated coastal currents instead.

As tides ebb and flow, currents are often generated in coastal waters (quite often in areas far-removed from bays and estuaries). In many places the shape of the seabed forces water to flow through narrow channels, or around headlands (much like the wind howls through narrow valleys and around hills). However, seawater has a much higher density than air, meaning that currents of 5 to 8 knots generate as much energy as winds of much higher velocity. In addition, unlike the wind rushing through a valley or over hilltops, tidally-generated coastal currents are predictable. The tide comes in and out every twelve hours, resulting in currents which reach peak velocity four times every day. Two rival technologies -- tidal fences and tidal turbines -- are now being developed to catch the energy of these currents.

Coastal currents are strongest at the margins of the world's larger oceans. A review of likely tidal power sites in the late 1980s estimated the energy resource was in excess of 330,000 MW. South East Asia is one area where it is likely such currents could be exploited for energy. In particular, the Chinese and Japanese coasts, and the large number of straits between the islands of the Philippines are suitable for development of power generation from coastal currents.

Tidal Fences. Tidal fences are effectively barrages, which completely block a channel. As discussed above, if deployed across the mouth of an estuary they can be very environmentally destructive. However, in the 1990s their deployment in channels between small islands or in straits between the mainland and island has increasingly been considered as a viable option for generation of large amounts of electricity.

The advantage of a tidal fence is that all the electrical equipment (generators and transformers) can be kept high above the water. Also, by decreasing the cross-section of the channel, current velocity through the turbines is significantly increased.

The first large-scale commercial fences are likely to be built in South East Asia. The most advanced plan is for a scheme for a fence across the Dalupiri Passage between the islands of Dalupiri and Samar in the Philippines, agreed between the Philippines Government and Energy Engineering Company of Vancouver, Canada in late 1997. The site, on the south side of the San Bernardino Strait, is approx. 41 m deep (with a relatively flat bottom) and has a peak tidal current of about 8 knots. As a result, the fence is expected to generate up to 2,200 MW of peak power (with a base daily average of 1,100 MW) (Osborne 2000).

Tidal Turbines. Tidal turbines are the chief competition to the tidal fence and are what are being proposed for the San Francisco Pilot Project. Looking like an underwater wind turbine they offer a number of advantages over the tidal fence. They are less disruptive to wildlife, allow small boats to continue to use the area, and have much lower material requirements than the fence.

Tidal turbines function well where coastal currents run at 2 to 2.5 m/s (slower currents tend to be uneconomic while larger ones put a lot of stress on the equipment). Such

currents provide an energy density four times greater than air, meaning that a 15-meter diameter turbine will generate as much energy as a 60-meter diameter windmill. In addition, tidal currents are both predictable and reliable, a feature which gives them an advantage over both wind and solar systems. The tidal turbine also offers significant environmental advantages over wind and solar systems; the majority of the assembly is hidden below the waterline, and all cabling is along the seabed.

There are many sites around the world where tidal turbines could be effectively installed. The ideal site is close to shore (within 1 km) in water depths of about 20-30 meters. Peter Fraenkel, director of UK-based Marine Current Turbines, believes the best sites could generate more than 10 megawatts of energy per square kilometer. The European Union has already identified 106 sites which would be suitable for the turbines, 42 of them around the UK. Further afield, Fraenkel believes the Philippines, Indonesia, China and Japan could all develop underwater turbine farms (Osborne 2000).

Rationale for Elimination

There are reliability concerns with the technology because it is so new. San Francisco has been looking closely at technology developed by HydroVenturi Inc., which started in London and now has a San Francisco office. Expanding from a test to an underwater grid powering the entire city would take many years (beyond the timeframe of the Proposed Project) and would need to overcome environmental hurdles (see below).

There would be regulatory feasibility issues associated with permitting from the USACE, BCDC, and/or the California Coastal Commission (depending on the location) for the large underwater area required for tidal energy generation. This technology is also new, and it is not clear whether the technology is feasible.

In addition, extensive underwater acreage would be required to generate enough electricity to meet demand. Tidal technologies have the potential to cause significant biological impacts, especially to marine species and habitats. Fish could be caught in the unit's fins by the sudden drop in pressure near the unit. The passageways, more than 15 feet high and probably sitting on the bay floor, could squeeze out marine life that lives there or alter the tidal flow, sediment build-up, and the ecosystem in general. San Francisco's test project as well as environmental impact studies would be necessary to determine potential significant impacts. Also, depending on its location commercial shipping could be disrupted during construction.

In summary, tidal generation is not yet a feasible technology on the scale required to replace a 145 MW generation project in the San Francisco area. In addition, it has the potential to create significant impacts, which would result in potential regulatory infeasibility. Therefore, this alternative was eliminated from further consideration.

Wave Technology

Alternative Description

Wave power technologies have been around for nearly thirty years. Setbacks and a general lack of confidence have contributed to slow progress towards proven devices that would have a good probability of becoming commercial sources of electrical power.

The highest energy waves are concentrated off the western coasts in the 40° to 60° latitude range north and south. The power in the wave fronts varies in these areas between 30 and 70 kW/m with peaks to 100kW/m in the Atlantic southwest of Ireland, the Southern Ocean and off Cape Horn. The capability to supply electricity from this resource is such that, if harnessed appropriately, 10 percent of the current level of world supply could be provided (WEC 2001). Work is still needed to determine how much more may be captured by other products (such as pumped water for desalination or electrolysis), once the storage technology for hydrogen is suitably developed.

The total power of waves breaking on the world's coastlines is estimated at 2 to 3 million megawatts. In favorable locations, wave energy density can average 65 MW-per-mile of coastline. Three approaches to capturing wave energy are:

- **Floats or Pitching Devices.** These devices generate electricity from the bobbing or pitching action of a floating object. The object can be mounted to a floating raft or to a device fixed on the ocean floor.
- **Oscillating Water Columns (OWC).** These devices generate electricity from the wave-driven rise and fall of water in a cylindrical shaft. The rising and falling water column drives air into and out of the top of the shaft, powering an air-driven turbine.
- **Wave Surge or Focusing Devices.** These shoreline devices, also called "tapered channel" or "tapchan" systems, rely on a shore-mounted structure to channel and concentrate the waves, driving them into an elevated reservoir. Water flow out of this reservoir is used to generate electricity, using standard hydropower technologies.

An experimental wave project was run in summer 2004 by Ocean Power Delivery Ltd in the Scottish Orkneys, which successfully provided power to 500 homes through Scottish Power. Marine power research has received millions of dollars worth of government subsidies in Scotland, but the United States currently has no federal program.

In summer 2005, Verdant Power is scheduled to place six turbines on the bottom of New York City's East River to supply power to a food market on Roosevelt Island in the river, which separates Manhattan from the boroughs of Brooklyn and Queens. The company is seeking the go-ahead to install as many as 200 to 300 turbines in the East River. If expanded, the project could produce five to 10 MW of electricity at an initial cost of \$20 million (Anderson and Gardner 2005).

The United States does not have any wave energy facilities to date, but many coastal communities have toyed with the notion. In fact, about 30 wave-energy ventures have been tried somewhere around the world in recent years--and most have foundered. Some systems have managed to move from drawing boards to the sea, where they are actually producing small amounts of power, including such projects as the Pelamis in Scotland and the Limpet in Ireland. But, generally speaking, wave energy technology has been unsuccessful. In most coastal areas, waves are intermittent, which means energy production is spotty. Virtually all of the devices tested in the past only produced electricity when the surf was up, with no means of storing power.

The devices typically produce what's known as low-frequency power, which can be difficult and expensive to convert to high-frequency electrical grids. Also, many of the devices are complicated and somewhat fragile, and do not stand up well to heavy surf.

And past wave technologies involved lots of electrical components, hydraulic fluids and oils, all presenting pollution risk.

Currently, the most ambitious project is planned for Humboldt's remote and battered coast, where a Minnesota energy-engineering company will introduce the Seadog, a pump that operates on wave motion. The Seadog, say its inventors, represents a different, simpler and more rugged approach that can actually turn an elusive dream into a commercial reality (Martin 2004).

Manufactured by Independent Natural Resources Inc. of Eden Prairie, MN, the device is an anchored mechanical pump that uses wave action to transport seawater to an elevated reservoir onshore. Water from the reservoir is then released down a flume to turn a turbine, which produces high-frequency electricity. Energy is stored latently, as water in the reservoir. When more electricity is needed, more water is released down the flume. The system involves no hydraulics, no noxious fluids, and no submerged cables.

Laboratory trials last year by the Offshore Technology Research Center at Texas A&M University showed the Seadog, in 26-inch surf, generated an operational pressure of 125 to 168 pounds per square inch, enough to push water almost 400 feet. That was within 95 to 98 percent of the performance figures cited by the company, and confirmed that the device could theoretically do what it was claimed to do.

Mark Thomas, the founder and president of Independent Natural Resources, said the Seadog evolved from a related energy production device that drove a motor by using the compressed air that is routinely fed into pipelines to move natural gas from one location to another. Bolstered by \$270,000 in venture capital, Thomas plans to have a single unit installed off the Humboldt coast by the end of the year to demonstrate the essential feasibility of the technology in the real marine world. The project must be approved by the California Coastal Commission and the State Lands Commission.

If the pump isn't battered into flotsam by Humboldt's heavy surf, a 16-pump project will follow, hooked up to a 50,000-gallon tank to store seawater for the hydropower production. That would cost about \$3 million and yield about 537 kilowatts, enough power to service about 600 homes.

A 200-pump, 6,700-kilowatt system would follow, powering more than 7,000 homes. According to the company's business plan, that would cost about \$16 million to build and require about \$1.6 million in annual maintenance and operational costs. Its electricity would cost about 3 1/2 cents a kilowatt-hour, which, generally speaking, is comparable to the cost of coal-generated electricity, cheaper than natural gas generation and more expensive than nuclear.

Ultimately, said Thomas, a 1-square-mile array could be built, generating about 750 MW, enough power for about 100,000 homes. If things ever get that far, such a plant would cost \$217 million to construct, cost about \$110 million a year to operate, and yield power priced at 2.08 cents a kilowatt-hour (Martin 2004).

CCSF co-hosted a conference on wave energy projects in September 2004 and is working on a demonstration project with Scotland's Ocean Power and the Palo Alto-

based Electric Power Research Institute (EPRI). The Scotland's Ocean Power Orkney project uses a floating steel cylindrical device, about the length of four train cars, with sections connected by hinged joints. Rolling waves move against the sections to pump high-pressure oil through hydraulic motors that generate electricity which is sent through a cable to the grid (Anderson and Gardner 2005). Hawaii, Oregon, and Massachusetts are participating in similar tests.

Rationale for Elimination

More than 1,000 patents for wave power machines are registered in the world today. The main parts of these patents are in the theoretical stages and only few plants have been built and tested. No commercial plants have been built yet. Therefore, wave power is new and may not be technologically feasible as an alternative to the SFERP. There would also be regulatory feasibility issues associated with permitting from the California Coastal Commission and the California State Lands Commission and also possible the USACE or the BCDC depending on location.

One big problem thus far with wave power systems is that of building and anchoring something that can withstand the roughest conditions at sea, yet can generate a reasonable amount of power from small waves. Wave power must be located where waves are consistently strong and even so the production of power depends on the size of waves resulting in large differences in the amount of energy produced. Unlike tidal energy, wave energy is much harder to predict and it is not consistent. Therefore in addition to feasibility concerns, there are reliability concerns, which would not make it a viable alternative.

Geothermal Resources

Alternative Description

Geothermal technologies use steam or high-temperature water (HTW) obtained from naturally occurring geothermal reservoirs to drive steam turbine/generators. There are vapor dominated resources (dry, super-heated steam) and liquid-dominated resources where various techniques are utilized to extract energy from the HTW.

Geothermal plants account for approximately five percent of California's power, and range in size from under 1 MW to 110 MW. Geothermal plants typically operate as base-load facilities and require 0.2 to 0.5 acre/MW. California is the largest geothermal power producer in the United States, with about 2,560 MW installed gross capacity and 1,754 MW net capacity (CEC 2003a). Geothermal plants provide highly reliable base-load power, with capacity factors from 90 to 98 percent.

Geothermal plants must be built near geothermal reservoir sites, because steam and hot water cannot be transported long distances without significant thermal energy loss. Geothermal power plants are operating in the following California counties: Lake, Sonoma, Imperial, Inyo, Mono, and Lassen. The gross capacity of The Geysers, located in Sonoma and Lake Counties near the City of Santa Rosa, is currently about 1,700 MW from 21 power plants.

Geothermal projects have fairly high capital costs, as compared to many other power generation technologies. New plants that are expansions of fields, such as in the

Imperial Valley, will be less expensive than the construction of geothermal plants in new fields. This aspect has been a deterrent for some developers. The total capital cost to build a 25 to 50 MW flash plant in today's market varies from about \$2,100/kW to \$2,600/kW. The capital costs of developing 10 to 30 MW binary plants range from \$3,000/kW to \$3,300/kW. Many factors dictate the ultimate capital costs including resource temperature and chemistry, productivity of each well, size of the facility, type of terrain, H₂S abatement requirements, etc. The turbines are generally custom made (from standard frame sizes) to match the characteristics of the resource and the design approach to the other major plant equipment (CEC 2004 - Comparative Study of Transmission Alternatives, Background Report).

Rationale for Elimination

Geothermal is a commercially available technology, but it is limited to areas geologic conditions resulting in high subsurface temperatures. Even in areas where such conditions are present, there have been issues with the reliability of the steam supply and the corrosiveness of the supply. There are no viable geothermal resources in the CCSF region.

Biomass

Alternative Description

Biomass electricity is generated by burning organic fuels in a boiler to produce steam, which then turns a turbine. Biomass can also be converted into a fuel gas such as methane and burned. Wood is the most commonly used biomass for power generation. Major biomass fuels include forestry and mill wastes, agricultural field crop and food processing wastes, and construction and urban wood wastes. Several techniques are used to convert these fuels to electricity, including direct combustion, gasification, and anaerobic fermentation. Biomass facilities do not require the extensive amount of land as the other renewable energy sources discussed above.

Currently, 2.2 percent of the state's electricity derives from biomass and waste-to-energy sources. Most biomass plant capacities are in the 3 to 10 MW range and typically operate as base-load capacity. Unlike other renewables, the locational flexibility of biomass facilities would reduce the need for significant transmission investments. The total California plant operating capacity is about 610 MW, and the idle capacity is about 122 MW. A number of biomass plants have been dismantled (CBEA 2003).

Rationale for Elimination

Most biomass facilities produce only small amounts of electricity (in the range of 3 to 10 MW), and so could not meet project objectives. There is no source of fuel (usually agricultural waste) for biomass facilities in the San Francisco area. Biomass facilities also generate significant air emissions and require numerous truck deliveries to supply the plant with the waste. Also, in waste-to-energy facilities there is some concern regarding the emission of toxic chemicals, such as dioxin, and the disposal of the resultant toxic ash.

DEMAND-SIDE MANAGEMENT

Alternative Description

The Warren-Alquist Act specifically prohibits the Energy Commission from considering conservation programs as alternatives to a proposed generation project. Public Resources Code Section 25305(c) states that conservation, load management, or other demand reducing measures reasonably expected to occur shall be explicitly examined in the Energy Commission's energy forecasts and shall not be considered as alternatives to a proposed facility during the siting process. Therefore, the approximate effect of such programs has already been accounted for in the agency's "integrated assessment of need," and the programs would not in themselves be sufficient to substitute for the additional generation calculated to be needed. The forecast that will address this issue is the Energy Commission's California Energy Outlook. The Warren-Alquist Act was amended in 1999 to delete the necessity of an Energy Commission finding of "need" in power plant licensing cases.

While these load management tools are not fully analyzed as alternatives to the SFERP project they are described herein for the benefit of the public and decisionmakers.

Demand-side management programs are designed to reduce customer energy consumption. Regulatory requirements dictate that supply-side and demand-side resource options should be considered on an equal basis in a utility's plan to acquire lowest cost resources. One goal of these programs is to reduce overall electricity use. Some programs also attempt to shift such energy use to off-peak periods.

Demand-side management includes a variety of approaches, including energy efficiency and conservation, building and appliance standards, load management and fuel substitution. Since 1975, the displaced peak demand from all of these efforts has been roughly the equivalent of eighteen 500 MW power plants. The annual impact of building and appliance standards has increased steadily, from 600 MW in 1980 to 5,400 MW in 2000, as more new buildings and homes are built under increasingly efficient standards (CEC 2003b). Savings from energy efficiency programs implemented by utilities and state agencies have also increased (from 750 to 3,300 MW). During the summer of 2001, between 70 to 75 percent of the peak load reductions came from consumer conservation efforts, while 25 to 30 percent came from energy efficiency investments (CEC 2003b).

California Energy Commission

One alternative to a power generation project could be programs to reduce energy consumption. In spite of the State's success in reducing demand in 2001, California continues to grow and overall demand is increasing. The 2002-2012 Electricity Outlook Report (CEC 2002c) concludes that, despite exceptional conservation efforts in 2001, voluntary demand reduction will likely decrease over time.

While conservation and demand reduction programs are not considered as alternatives to a proposed project, the Energy Commission is responsible for several such programs, the most notable of which are energy efficiency standards for new buildings and for major appliances. These programs are typically called "energy efficiency," "conser-

vation,” or “demand side management” programs. One goal of these programs is to reduce overall electricity use; some programs also attempt to shift such energy use to off-peak periods.

The Energy Commission’s Energy Efficiency Standards for Residential and Nonresidential Buildings (Title 24, Part 6) were established in 1978 in response to a legislative mandate to reduce California’s energy consumption. The standards are updated periodically to allow consideration and possible incorporation of new energy efficiency technologies and methods. The Energy Commission adopted new standards in 2001, as mandated by Assembly Bill 970 to reduce California’s electricity demand. The new standards went into effect on June 1, 2001. In 2004, the Energy Commission adopted updated and more stringent standards that supersede the 2001 standards and will take effect on October 1, 2005, following their publication as part of the State Building Code (CEC 2005 - Title 24, Part 6, of the California Code of Regulations: California’s Energy Efficiency Standards for Residential and Nonresidential Buildings). Since 1975, the displaced peak demand from these conservation efforts has been roughly the equivalent of eighteen 500 MW power plants. The annual impact of building and appliance standards has increased steadily, from 600 MW in 1980 to 5,400 MW in 2000, as more buildings and homes are built under increasingly efficient standards (CEC 2002c).

After the California Independent System Operator (CA ISO) ordered rolling blackouts in January 2001 as a result of statewide electricity shortages, conservation efforts initially resulted in dramatic reductions in electricity use. Electricity use for each month in 2001 ranged from 5 percent to 12 percent less than it was in 2000. However, by 2002 demand began to increase as the memories of rolling blackouts faded.

The Energy Commission is also responsible for determining what the state’s energy needs are in the future, using 5- and 12-year forecasts of both energy supply and demand. The Energy Commission calculates the energy use reduction measures discussed above into these forecasts when determining what future electricity needs are, and how much additional generation will be necessary to satisfy the state’s needs.

Having considered all of the demand side management that is “reasonably expected to occur” in its forecasts, the Energy Commission then determines how much electricity is needed. The most recent estimation of electricity needs is found in the 2002-2002 Electricity Outlook Report (available on the Energy Commission’s website).

The California Energy Commission’s forecasts contain assumptions regarding conservation. As detailed in the Energy Commission’s 2002-2012 Electricity Outlook Report, February 2002, “The uncertainty about what caused the demand reduction in the summer of 2001, in particular, the uncertainty about how much was due to temporary, behavioral changes and how much was due to permanent, equipment changes contributes to increased uncertainty about future electricity use trends. The three scenarios discussed in this chapter were developed to provide a range of possible electricity futures that account for the demand reductions of the summer of 2001 and uncertainties about future demand reductions and future economic growth. These scenarios combine different levels of temporary and permanent reductions to capture a reasonable range of possible electricity futures.”

The Energy Commission report describes the three scenarios as follows: “The most likely scenario, labeled “Slower Growth in Program Reductions, Faster Drop in Voluntary Reductions . . .,” assumes that program benefits increase in 2002 but stay constant after that, while voluntary impacts on energy consumption reduction decrease more rapidly starting with a drop of 1,500 MW in 2002. The lower scenario, labeled “Slow Growth in Program Reductions, Slow Decline in Voluntary Reductions,” assumes that program impacts grow from 2001 to 2006 while benefits of voluntary reductions drop slowly over the period after a drop of 1,000 MW in 2002. The higher scenario, labeled ‘No growth, then drop in Program Reductions, No Voluntary Reductions,’ assumes that there are no benefits from voluntary actions in 2002 and after, while benefits of programs stay constant until 2005 and then start declining.”

California Public Utilities Commission

In addition, the CPUC supervises various demand-side management programs administered by the regulated utilities, and many municipal electric utilities have their own demand-side management programs. The combination of these programs constitutes the most ambitious overall approach to reducing electricity demand administered by any state in the nation. In spite of the state’s success in reducing demand to some extent in 2001, California continues to grow and overall demand is increasing. Economic and price considerations but also long-term impacts of state-sponsored conservation efforts, such as the Governor’s 20/20 rebate program and new appliance efficiency standards are considered in load forecasts. However, there are electricity-trend uncertainties about how much the demand reduction in the summer of 2001 was due to temporary behavioral changes and how much was due to permanent equipment changes.

City and County of San Francisco

In July 2003, the San Francisco Board of Supervisors approved a \$16.3 million joint energy efficiency pilot project with Pacific Gas and Electric Company (PG&E) and San Francisco’s Environment Department (SF Environment). The San Francisco Peak Energy Pilot Program is designed to increase reliability by reducing peak energy demand for both residential and business customers.

This program is funded by California utility customers and administered by the investor owned utilities under the auspices of the California Public Utilities Commission. The ultimate goal of the program is to reduce electric demand during both the peak summer air conditioning and winter heating seasons. Implementation of the project will include nine energy efficient program elements aimed at reducing usage in San Francisco by 16 MW by January 2005 to assist in the closure of Hunter’s Point Power Plant.

Through a portfolio of energy efficiency programs, PG&E and SF Environment will work with hotel/motel, restaurant, and apartment owners. The programs are also designed to assist low-income residents and a special emphasis will target the Bayview-Hunter’s Point community. Some of the many programs include the following for each of the customer classes (SF Environment 2003):

Residential:

- **Residential Direct Install Program:** PG&E will leverage contacts being made by the Low Income Energy Efficiency Program to identify homes that qualify for the

direct installation of a variety of energy efficiency measures including interior hardwired fixtures, compact fluorescent lamps, programmable thermostats, increased incentives for second refrigerator turn in and halogen torchiere turn in/exchange. Special emphasis will be placed on working with CARE participants, seniors and board and care facilities.

- **Multifamily Energy Efficiency Rebate (MF):** Cash rebates will be available for the installation of qualified energy efficiency products in apartment dwelling units and common areas of apartment and condominium complexes.
- **Residential Case Studies:** SF Environment and PG&E will study residential building types in order to verify San Francisco's residential electric heating peak and how energy efficiency and other measures may be used to manage this peak.

Businesses:

- **Cash Rebates for Business Customers:** Cash rebates will be available for all business customers who replace old equipment with new energy efficient technologies.
- **Standard Performance Contracts (SPC):** SPC will offer business customer's financial incentives based on verified energy savings and demand reductions resulting from custom-designed projects.
- **Targeted System Energy Audits:** PG&E will provide specialized energy audits to large commercial customers who have a high potential for peak demand reduction.
- **Commercial Turnkey Services for Small and Medium Businesses:** SF Environment and PG&E will assist business customers to identify potential energy-saving opportunities and will help business customers find service providers to install energy efficient equipment and complete paperwork for applicable financial incentive programs.
- **Codes and Standards Support:** PG&E and SF Environment's building and planning department will provide energy efficiency review and recommendations on building projects that come to the planning department, promote incentive programs applicable to such projects, and analyze and draft potential energy efficiency ordinances to be considered for adoption for both existing and new buildings.
- **Emerging Technologies:** PG&E will demonstrate several new technologies for peak load reduction at customer sites in the city and promote project results to the applicable customer sectors.

Pacific Gas and Electric

Finally, PG&E themselves uses a program of voluntary reduction in electricity use known as Customer Energy Efficiency (CEE) in the project area. PG&E has had an active CEE program over the past two decades. Its cumulative reduction of use has been substantial. For any given planning area, the historical CEE energy and peak demand impacts have been subsumed within the peak load demands experienced year by year and thus their impacts are included in the forecast of peak growth. As for future potential CEE impacts, PG&E's Local Integrated Resource Plan (LIRP) study indicates that only 4 MW per year could be obtained through aggressive locally focused CEE.

Rationale for Elimination

Demand management can reduce energy consumption, thus reducing the need for gas-fired power generation. If demand were sufficiently reduced, all the effects of the Proposed Project would be avoided. However, as stated above, the Warren-Alquist Act specifically prohibits the Energy Commission from considering conservation programs as alternatives to a proposed generation project. In addition, demand-side management has been shown to be effective only at a relatively small scale, but not on a scale that would be required to replace the 145 MW SFERP.

DISTRIBUTED GENERATION

Alternative Description

The Energy Commission defines DG as “generation, storage, or demand-side management devices, measures, and/or technologies connected to the distribution level of the transportation and distribution grid, usually located at or near the intended place of use (CEC 2002b). There are many DG technologies, including microturbines, internal combustion engines, combined heat and power (CHP) applications, fuel cells, photovoltaics and other solar energy systems, wind, landfill gas, digester gas and geothermal power generation technologies. Distributed power units may be owned by electric or gas utilities, by industrial, commercial, institutional or residential energy consumers, or by independent energy producers. To the extent that it is established, DG acts to either reduce the load on the PG&E system or be applied as additional system generation. In either case, it would help to support PG&E’s ability to meet the applicable reliability criteria.

Distributed generation is the generation of electricity from facilities that are smaller than 50 MW in net generating capacity. Local jurisdictions—cities, counties and air districts—conduct all environmental reviews and issue all required approvals or permits for these facilities. Most DG facilities are very small, for example, a fuel cell can provide power in peak demand periods for a single hotel building. More than 2,000 MW of DG is now in place in California.

There are several incentive programs designed to provide financial assistance to those interested in operating Distributed Generation systems in California. Senate Bill 1345 (Statutes of 2000, Chapter 537, Peace, signed by Governor Davis in September 2000) directs the Energy Commission to develop and administer a grant program to support the purchase and installation of solar energy and small distributed generation systems. Solar energy systems include solar energy conversion to produce hot water, swimming pool heating, and electricity, as well as battery backup for PV applications. Small distributed generation systems include micro-cogeneration, gas turbines, fuel cells, electricity storage technologies (in systems other than PV), and reciprocating internal combustion engines.

Some problems of specific types of distributed generation include the following:

- **Renewable Energy Sources.** As discussed above, the high cost and limited dispatchability of small-scale renewable energy sources such as solar and wind power essentially inhibit their market penetration (Iannucci, et al., 2000; see the following section for discussion of larger scale renewable energy). In addition, biomass and wind

facilities require specific circumstances for siting (i.e., near sources of bio-fuel or in high wind areas), and have their own environmental consequences (e.g., requiring large land areas or resulting in large quantities of air emissions).

- **Fuel Cells.** The present high cost of and small generation capacity of fuel cells precludes their widespread use.
- **Other Fossil-fueled Systems.** Microturbines and various types of engines can also be used for distributed generation; these technologies are advancing quickly, becoming more flexible, and impacts are being reduced. However, they are still fossil-fueled technologies with the potential for significant environmental impacts, including noise. Such systems also have the potential for significant cumulative air quality impacts because individually they are typically small enough to avoid the regulatory requirements for air pollution control. Therefore, use of enough of these systems to constitute an alternative to the Proposed Project would potentially cause significant unmitigated air quality impacts.

Rationale for Elimination

While DG technologies are recognized as important resources to the region's ability to meet its long-term energy needs, DG does not provide a means for the applicant to meet its objectives for the Project because of the comparatively small capacity of DG systems and the relatively high cost.

Consideration of DG as an alternative to the SFERP is not feasible because no single entity has proposed implementing a substantial DG program. Also, a number of serious barriers, including technical issues, business practices, and regulatory policies, make interconnection to the electrical grid in the United States difficult. Broad use of distributed resources would likely require regulatory support and technological improvements. There could be regulatory feasibility issues with the lengthy permitting process. Air permits are generally the first permits sought for DG facilities because air district requirements influence equipment selection. Once the DG equipment has been selected, the land use approval process can begin. Local governments must know what makes and models of equipment will be installed to evaluate potential significant environmental impacts (e.g., noise and aesthetics) and to specify mitigation measures. Building permits are sought last because construction plans must incorporate all project changes required by the local government planning authority to mitigate environmental impacts. This lengthy permitting process would make it impossible to construct this technology within the timeframe of the SFERP.

In a report on DG (January 2002) the Energy Commission concluded that "DG is capable of providing several Transmission and Distribution (T&D) services, but the extent to which DG can be successfully deployed to effectively supply them are limited by (1) the technical capabilities of various DG technologies; (2) technical requirements imposed by the grid and grid operators; (3) business practices by T&D companies; and (4) regulatory rules and requirements . . . some technical barriers resulting from key characteristics of the prime mover will prevent some DG technologies from providing certain T&D services."

Potential new impacts created by DG would depend on the type of generation that would be used. Impacts of solar and wind facilities are addressed above. Other types of DG have air quality and noise impacts.

INTEGRATED RESOURCES ALTERNATIVE

Alternative Description

An integrated resources alternative could be made up of several components, rather than consideration of only a generation project. The components could include a combination of the following:

- Demand-side management
- Transmission system upgrades
- Development of solar power and other renewables
- Distributed generation
- Generating facilities or co-generation facilities.

Integrated resource planning (IRP) emerged in the 1980s as an analytic means of incorporating demand-side resources (i.e., energy efficiency and load management) into resource planning, as well as incorporating other factors such as uncertainty and environmental quality. As a planning methodology IRP integrates supply and demand-side options for providing energy services at a cost that appropriately balances the interests of all stakeholders. It incorporates into electricity planning the environmental and social aspects of electricity production, as well as the potential for reducing or shaping electricity demand. Whereas traditional planning for the energy sector primarily focused on energy supply and the financial interests of the power company, IRP aims at providing energy services (as distinct from energy per se) to the society at lowest cost and with the least negative impacts. Systematic analysis of all possible strategies to meet the energy service needs is undertaken, taking into account all future scenarios. This poses an analytical challenge, which is met through twin concepts of transparency and expert review.

The objective of IRP is to determine the least-cost solution to a capacity shortage or reliability problem by evaluating the cost-effectiveness of distributed resources, such as small-scale distributed generation (DG) and demand-side management (DSM) technologies, as well as proposed T&D capacity expansion projects. Under IRP, measures to reduce demand for power through energy efficiency and conservation would have to be considered on an equal footing with new proposals for power production. Uncertainties and risks with respect to demand and financial consequences are explicitly recognized and strategies are evolved to manage them. Importantly, the environmental and social impacts of strategies are fully integrated into the decision making process. It is recognized that as long as alternate resources are ranked according to economic criteria alone, neither the criterion of sustainability nor that of least total cost to society could be met.

This type of integrated resources planning is being implemented by the CCSF, with the combination of its Electricity Resource Plan discussed above.

Rationale for Elimination

None of these alternatives individually meet the stated project objectives. Depending on which configuration of the options would be implemented would determine overall effects of this alternative. The individual discussions above address potential impacts that would be created by the individual technology options.

Taken together and if implemented, they would diversify the system and would add needed capacity. Each of these components is technically feasible, and each could be implemented on a limited scale in CCSF, but there is no certainty of their implementation, especially within the timeframe required under the DWR Power Purchase Agreement (PPA).

Each also has environmental and regulatory obstacles to their implementation (described in the individual sections above). The combination of these alternatives would have no fewer obstacles than they would individually. Furthermore, implementation of a combination of resources could not be accomplished by the applicant in this project, and would require regulatory changes or financial incentives that are not available in today's market.

APPENDIX C. CA ISO COMMUNICATIONS

Following this page are copies of the following communications:

- April 18, 2003 CA ISO letter;
- October 22, 2003 CA ISO letter;
- CA ISO Matrix forwarded to CCSF on February 9, 2004
- July 1, 2004 letter
- CA ISO San Francisco Action Plan for San Francisco, Options & Risks, September 2004
- CA ISO San Francisco Revised Action Plan, approved November 5, 2004
- CA ISO Update on Action Plan for San Francisco (Attachment A), June 8, 2005
- CA ISO Revised Plan for San Francisco (Attachment A), September 2, 2005
- CA ISO October 27, 2004 letter Re: Response to September 14, 2004 CCSF Letter

REFERENCES

- Anderson, Leonard, and Timothy Gardner. 2005. New York City taps tide for electricity: Project is one of several worldwide to harness marine power. Online at <http://msnbc.msn.com/id/6968256/>. Accessed on July 5, 2005.
- Appell, David 2001. "The New Uncertainty Principle." Scientific American, January 2001. Online at <http://www.biotech-info.net/uncertainty.html>.
- ASPEN 2004a – Aspen Consultants/Lee (tn:32020). Report of Conversation re: Trans Bay Cable Project (as alternative to SFERP). Submitted to CEC/Dockets on 8/3/04.
- AWEA 2004 – American Wind Energy Association. Online at <http://www.awea.org>. Accessed on August 26.
- Babcock & Brown 2004. Summary Project Description, Trans Bay Cable Project, 08/03/04 Draft. August 3.
- Baird, Stuart 1993. Energy Fact Sheet: Tidal Energy. Originally published by the Energy Educators of Ontario. Online at <http://www.iclei.org/EFACTS/TIDAL.HTM>. Accessed on 8/24/04.
- BCDC 2001 - San Francisco Bay Conservation and Development Commission. Staff Recommendation on the Commission's Report to the California Energy Commission on the Potrero Power Plant Expansion. September 28.
- BCDC 2003 - San Francisco Bay Conservation and Development Commission. Personal Communication by Susan Lee (Aspen Environmental Group) with Lindy Lowe, Bay Conservation & Development Commission, on April 11.
- CA ISO 2004 – California Independent System Operator. Revised Action Plan Attachment 1: PG&E Transmission Projects and City Peaking Power Plants Necessary To Meet NERC/WECC/CAISO Planning Requirements. Online at <http://www.caiso.com/docs/2004/11/05/2004110512085728502.html>. Accessed on June 22, 2005.
- Calpine 2001. Application for Certification for the Russell City Energy Center – 600-megawatt natural-gas fired power plant located in Hayward. Submitted to CEC/Larson/Dockets on 5/22/01.
- CBEA 2003 - California Biomass Energy Alliance. Biomass 101. Online at <http://www.calbiomass.org>. December.
- CCSF 2004 – City and County of San Francisco, Planning Department. Notification of Project Receiving Environmental Review. August 24.
- CEC 1995. San Francisco Energy Company Staff Assessment (94-AFC-1). June.

- CEC 2001. United Golden Gate Phase 1 Final Staff Assessment (00-AFC-5).
January 11.
- CEC 2002a. Potrero Power Plant Unit 7 Final Staff Assessment (00-AFC-4).
February 13.
- CEC 2002b. Russell City Energy Center Final Staff Assessment (01-AFC-7). June 10.
- CEC 2002c. 2002-2012 Electricity Outlook Report. Publication 700-01-004F, Originally
online February 14.
- CEC 2003a. Unpublished Report Prepared for the Energy Commission by Aspen
Environmental Group under Work Authorization 309. Submitted to Dave Maul.
- CEC 2003b. 2003 Environmental Performance Report. Publication 100-03-010. August.
- CEC 2004 - Comparative Study of Transmission Alternatives, Background Report.
Publication 700-04-006. Placed online June 8.
- CEC 2004 - Energy Commission Energy Facilities Status. Online at
http://www.energy.ca.gov/sitingcases/all_projects.html. Accessed on July 22.
- CEC 2005 - Title 24, Part 6, of the California Code of Regulations: California's Energy
Efficiency Standards for Residential and Nonresidential Buildings. Online at
<http://www.energy.ca.gov/title24/>. Accessed on June 17, 2005.
- CPUC 2003 – California Public Utilities Commission. Final Environmental Impact
Report for the Jefferson-Martin 230 kV Transmission Project (02-09-043).
Prepared for the CPUC by Aspen Environmental Group. October.
- DeShazo, Gary 2005. Personal Communication by Hedy Born (Aspen Environmental
Group) with Gary DeShazo, California Independent System Operator (CA ISO),
on 6/22/05.
- Doyle, John 2005. Personal Communication by Hedy Born (Aspen Environmental
Group) with John Doyle, SFPUC, on 7/5/05.
- DTSC 2004 - Department of Toxic Substances Control. Site Cleanup – Site Mitigation
and Brownfields Reuse Program Database. Southern Pacific – Brisbane. Online
at <http://www.dtsc.ca.gov/database/Calsites/>. Accessed on June 29.
- Edwards, Marcie 2004a. Interim CEO, CAISO, memorandum to the CAISO Board of
Governors: Action Plan for San Francisco, Options and Risks. September 10.
- Edwards, Marcie 2004b. Interim CEO, CAISO, memorandum to the CAISO Board of
Governors: Board Endorsement of Revised Action Plan for San Francisco.
November 5.
- Iannucci, Joseph, et al. 2000 - Joseph Iannucci, Susan Horgan, James Eyer, and Lloyd
Cibulka. Air Pollution Emission Impacts Associated with Economic Market
Potential of Distributed Generation in California. Prepared for the California Air

- Resources Board and the California Environmental Protection Agency. Contract 97-326, Amendment 2. Online at http://www.energy.ca.gov/distgen_oii/documents/dgwg/R+D-11.pdf. Published in June.
- IEEE. 2005 - IEEE Power Engineering Society, Energy Development And Power Generation Committee. 2005 Panel Session: Harnessing The Untapped Energy Potential Of The Oceans: Tidal, Wave, Currents And OTEC. Chaired by Peter Meisen and Tom Hammons. Dated June. Online at <http://www.ewh.ieee.org/cmte/ips/2005GM/oceans.pdf>. Accessed on September 2.
- Kienker, Leigh. 2005. Personal Communication by Hedy Born (Aspen Environmental Group) with Leigh Kienker, San Francisco Department of the Environment, on 10/17/05.
- Llanos, Miguel. 2003. "San Francisco to test tides for energy." MSNBC website. Online at <http://www.msnbc.com/news/910115.asp?vts=050820031455&cp1=1>. Accessed on May 8.
- Martin, Glen 2004. "Wave power plan gets a test; Town hopes new device will tap surf for energy." San Francisco Chronicle. Online at <http://www.sfgate.com>. Dated August 4. Accessed on 8/24/04.
- NERC 2003 – North American Electric Reliability Council. NERC Generating Availability Data System (GADS). Online at <http://www.nerc.com>. Accessed in August 2004.
- Osborne, Peter 2000. Electricity from the Sea. Originally published in September 1998, web version updated in July 2000. Online at <http://www.fujitaresearch.com/reports/tidalpower.html>. Accessed on 8/24/04.
- Pelkas, John 2004. Personal Communication by Hedy Born (Aspen Environmental Group) with John Pelkas, The Presidio Trust, Planning, on 9/1/04.
- Presidio 2002 - The Presidio of San Francisco. Presidio Trust Management Plan (PTMP): Land Use Policies For Area B Of The Presidio Of San Francisco, Final Environmental Impact Statement And Environmental Review Process. Chapter 3. Adopted 8/23/02. Online at http://www.presidiotrust.gov/documents/ptip/EIS/volume1/Chapt3_utilities.pdf.
- Presidio 2004 – The Presidio of San Francisco. Online at <http://www.presidio.gov>. Accessed on August 26.
- RCEC 2002 - Russell City Energy Center LLC. Environmental Assessment of Reconductoring the East Shore to San Mateo 230 kV Transmission Line (01-AFC-7). Submitted to CEC on 5/6/02.

SECAL 2000 – Southern Energy California. Application for Certification for the Potrero Power Plant Unit 7 Project – a 580 MW natural gas-fired, combined cycle power generating facility. Submitted to the CEC/Librarian/Dockets on 6/7/00.

SF Environment 2002 – San Francisco Office of the Environment. Press Release: City Electricity Plan details critical energy shortfall if needed in-city generation not in place by 2005. Online at http://temp.sfgov.org/sfenvironment/articles_pr/2002/pr/082002.htm. Dated 8/20/02. Accessed on 8/26/04.

SF Environment 2003 – San Francisco Department of the Environment. “Supervisors approve \$16 million energy efficiency program for businesses and residential customers in San Francisco.” Online at http://temp.sfgov.org/sfenvironment/articles_pr/2003/pr/072303.htm. Dated July 23. Accessed on August 16, 2004.

SF Visitor 2004 – San Francisco Convention and Visitors Bureau. Press Releases: Mayor Newsom Dedicates Historic Solar Installation. Online at <http://www.sfvisitor.org/travelmedia/press>. Accessed on August 26. Dated March.

SFERP 2004a - City and County of San Francisco/Blout (tn:31130). Application for Certification San Francisco Electric Reliability Project - 145-megawatt natural gas-fired peaking power plant located in San Francisco. Submitted to CEC/Therkelsen/Dockets on 3/18/04.

SFERP 2004q – CH2MHill/Carrier (tn:31854). Data Responses Set 1A. Response to Staff's Data Requests dated 6/4/04. Submitted to CEC/Pfanner/Dockets on 7/6/04.

SFERP 2004aa – CH2MHill (tn: 32141). Response to Data Requests 1 through 9, Set 1. Submitted to CEC/Dockets on 8/18/04.

SFPUC 2005a – San Francisco Public Utilities Commission/Hale (tn: 34403). Amendment A of the Application for Certification. Submitted to CEC/Therkelsen/Dockets on 3/25/05.

Taylor, Tricia 2004. Personal Communication by Hedy Born (Aspen Environmental Group) with Tricia Taylor, City of Brisbane Building and Planning Department, on 6/29/04.

TIDA 2004 – Treasure Island Development Authority. Online at <http://www.ci.sf.ca.us/site/treasureisland>. Accessed on August 26.

U.S. Census 2000 – United States Census Bureau. Bay Area Census. Online at <http://www.bayareacensus.ca.gov/small/small.htm>. Accessed on August 31, 2004.

UGGPC 2001 - United Golden Gate Power Company LLC. Application for Certification for the Golden Gate Power Project – 570-megawatt natural-gas fired power plant

located at the San Francisco International Airport. Submitted to CEC/Larson/Dockets on 3/19/01.

USACE 2003 - U.S. Army Corps of Engineers. Personal Communication by Hedy Born (Aspen Environmental Group) with Clyde Davis, USACE Dredging Manager, on March 24.

Vote Solar 2005. The Moscone Convention Center Solar Project. Online at <http://www.votesolar.org/moscone.html>. Accessed June 21, 2005.

WEC 2001 – World Energy Council. WEC Survey of Energy Resources 2001 – Wave Energy. Online at <http://www.worldenergy.org/wec-geis/publications/reports/ser/wave/wave.asp>. Published in October. Accessed on 8/24/04.

Wilson, Ralph 2004. The Planning Process for Pier 70. Online at <http://www.pier70sf.org/future/planning.html>. Accessed on June 29.

Zorzynski, Vic 2004. Personal Communication by Hedy Born (Aspen Environmental Group) with Vic Zorzynski, Treasure Island Utilities, on 9/1/04.

GENERAL CONDITIONS INCLUDING COMPLIANCE MONITORING AND CLOSURE PLAN

Testimony of Christopher Meyer

INTRODUCTION

The project General Conditions Including Compliance Monitoring and Closure Plan (Compliance Plan) have been established as required by Public Resources Code section 25532. The plan provides a means for assuring that the facility is constructed, operated and closed in compliance with public health and safety, environmental and other applicable regulations, guidelines, and conditions adopted or established by the California 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:

1. set forth the duties and responsibilities of the Compliance Project Manager (CPM), the project owner, delegate agencies, and others;
2. set forth the requirements for handling confidential records and maintaining the compliance record;
3. state procedures for settling disputes and making post-certification changes;
4. 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 of certification;
5. establish requirements for facility closure plans.
6. specify conditions of certification for each technical area containing the measures required to mitigate any and all potential adverse project impacts associated with construction, operation and closure to an insignificant level. Each specific condition of certification also includes a verification provision that describes the method of assuring that the condition has been satisfied.

DEFINITIONS

The following terms and definitions are used to establish when Conditions of Certification are implemented:

PRE-CONSTRUCTION SITE MOBILIZATION

Site mobilization is limited preconstruction activities at the site to allow for the installation of construction trailers, construction trailer utilities, and construction trailer parking at the site. Limited ground disturbance, grading, and trenching associated with the above mentioned pre-construction activities is considered part of site mobilization. Fencing for the site is also considered part of site mobilization. Walking, driving or parking a passenger vehicle, pickup truck and light vehicles is allowable during site mobilization.

CONSTRUCTION GROUND DISTURBANCE

Construction-related ground disturbance refers to activities that result in the removal of top soil or vegetation at the site and for access roads and linear facilities.

CONSTRUCTION GRADING, BORING, AND TRENCHING

Construction-related grading, boring, and trenching refers to activities that result in subsurface soil work at the site and for access roads and linear facilities, e.g, alteration of the topographical features such as leveling, removal of hills or high spots, moving of soil from one area to another, and removal of soil.

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:

1. the installation of environmental monitoring equipment;
2. a soil or geological investigation;
3. a topographical survey;
4. any other study or investigation to determine the environmental acceptability or feasibility of the use of the site for any particular facility; or
5. any work to provide access to the site for any of the purposes specified in "Construction" 1, 2, 3, or 4 above.

START OF COMMERCIAL OPERATION

For compliance monitoring purposes, "commercial operation" begins after the completion of start-up and commissioning, where the power plant has reached reliable steady-state production of electricity 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

The CPM will oversee the compliance monitoring 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;
2. resolving complaints;
3. processing post-certification changes to the conditions of certification, project description, and ownership or operational control;
4. documenting and tracking compliance filings; and
5. ensuring that the compliance files are maintained and accessible.

The CPM is the contact person for the Energy Commission and will consult with appropriate responsible agencies and the Energy Commission when handling disputes, complaints and amendments.

All project compliance submittals are submitted to the CPM for processing. Where a submittal required by a condition of certification requires CPM approval, the approval will involve all appropriate Energy Commission staff and management.

PRE-CONSTRUCTION AND PRE-OPERATION COMPLIANCE MEETING

The CPM usually schedules 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 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):

1. all documents demonstrating compliance with any legal requirements relating to the construction and operation of the facility;
2. all monthly and annual compliance reports filed by the project owner;
3. all complaints of noncompliance filed with the Energy Commission; and
4. all petitions for project or condition of certification changes and the resulting staff or Energy Commission action.

PROJECT OWNER RESPONSIBILITIES

The project owner is responsible for ensuring that the general compliance conditions and all of the other conditions of certification that appear in the staff assessment sections 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, conditions of certification, 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 (**COMPLIANCE-1, COMPLIANCE-2**, etc.) refers to the specific General Compliance Condition contained in **Compliance Table 1**.

GENERAL CONDITIONS OF CERTIFICATION

Construction Milestones, Compliance Condition of Certification 1 (COMPLIANCE-1)

The Monthly Compliance Report is the vehicle for notifying the CPM of applicable construction milestones, or for amending previously established milestones, for pre-construction and construction phases of the project. The project owner may also send a letter, an e-mail message, or make a phone call to notify the CPM of planned changes to the milestones.

- A. ESTABLISH PRE-CONSTRUCTION MILESTONES TO ENABLE START OF CONSTRUCTION (WITHIN ONE YEAR OF CERTIFICATION WHEN REQUIRED)
 - 1. Obtain site control
 - 2. Obtain financing
- B. ESTABLISH CONSTRUCTION MILESTONES FROM DATE OF START OF CONSTRUCTION
 - 1. Begin pouring major foundation concrete
 - 2. Begin installation of major equipment
 - 3. Complete installation of major equipment
 - 4. Begin gas pipeline construction
 - 5. Complete gas pipeline interconnection
 - 6. Begin T-line construction
 - 7. Complete T-line interconnection

The CPM will negotiate the above-cited pre-construction and construction milestones with the project owner based on an expected schedule of construction. The CPM may agree to modify the final milestones from those listed above at any time prior to or during construction if the project owner demonstrates good cause for not meeting the originally-established milestones.

- C. A FINDING THAT THERE IS GOOD CAUSE FOR FAILURE TO MEET MILESTONES WILL BE MADE IF ANY OF THE FOLLOWING CRITERIA ARE MET:
 - 1. The change in any milestone does not change the established commercial operation date milestone.
 - 2. The milestone will be missed due to circumstances beyond the project owner's control.
 - 3. The milestone will be missed, but the project owner demonstrates a good-faith effort to meet the project milestone.
 - 4. The milestone will be missed due to unforeseen natural disasters or acts of God that prevent timely completion of the milestones.
 - 5. The milestone will be missed due to requirements of the California ISO.

Unrestricted Access (COMPLIANCE-2)

The CPM, responsible Energy Commission staff, and delegate agencies or consultants shall be guaranteed and granted unrestricted access to the power plant site, related facilities, project-related staff, and the records maintained on site, for the purpose of conducting audits, surveys, inspections, or general site visits. Although the CPM will normally schedule site visits on dates and times agreeable to the project owner, the CPM reserves the right to make unannounced visits at any time.

Compliance Record (COMPLIANCE-3)

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.

Energy Commission staff and delegate agencies shall, upon request to the project owner, be given unrestricted access to the files.

Compliance Verification Submittals (COMPLIANCE-4)

Each condition of certification is followed by a means of verification. The verification describes the Energy Commission’s procedure(s) to ensure post-certification compliance with adopted conditions. The verification procedures, unlike the conditions, may be modified as necessary by the CPM, and in most cases without full Energy Commission approval.

Verification of compliance with the conditions of certification can be accomplished by:

1. reporting on the work done and providing the pertinent documentation in monthly and/or annual compliance reports filed by the project owner or authorized agent as required by the specific conditions of certification;
2. providing appropriate letters from delegate agencies verifying compliance;
3. Energy Commission staff audits of project records; and/or
4. Energy Commission staff inspections of mitigation or other evidence of mitigation.

Verification lead times (e.g., 90, 60 and 30-days) associated with start of construction may require the project owner to file submittals during the certification process, particularly if construction is planned to commence shortly after certification.

A cover letter from the project owner or authorized agent is required for all compliance submittals and correspondence pertaining to compliance matters. **The cover letter subject line shall identify the involved condition(s) of certification by condition number and include a brief description of the subject of the submittal.** The project owner shall also identify those submittals **not** required by a condition of certification with a statement such as: “This submittal is for information only and is not required by a specific condition of certification.” When submitting supplementary or corrected information, the project owner shall reference the date of the previous submittal.

The project owner is responsible for the delivery and content of all verification submittals to the CPM, whether such condition was satisfied by work performed by the project owner or an agent of the project owner.

All submittals shall be addressed as follows:

**Compliance Project Manager
California Energy Commission
1516 Ninth Street (MS-2000)
Sacramento, CA 95814**

If the project owner desires Energy Commission staff action by a specific date, they shall so state in their submittal cover letter and include a detailed explanation of the effects on the project if this date is not met.

Pre-Construction Matrix and Tasks Prior to Start of Construction (COMPLIANCE-5)

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 or prior to the first pre-construction meeting, whichever comes first. It will be in the same format as the compliance matrix referenced above.

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 development.

If the project owner anticipates starting project construction as soon as the project is certified, it may be necessary for the project owner to file compliance submittals prior to project certification. This is important if the required lead-time for a required compliance event extends beyond the date anticipated for start of construction. It is also important that the project owner understand that 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

COMPLIANCE REPORTING

There are two different compliance reports that the project owner must submit to assist the CPM in tracking activities and monitoring compliance with the terms and conditions of the Energy Commission Decision. During construction, the project owner or authorized agent will submit Monthly Compliance Reports. During operation, an Annual Compliance Report must be submitted. These reports, and the requirement for an accompanying compliance matrix, are described below. The majority of the conditions

of certification require that compliance submittals be submitted to the CPM in the monthly or annual compliance reports.

Compliance Matrix (COMPLIANCE-6)

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; and
7. the compliance status of each condition, e.g., “not started,” “in progress” or “completed” (include the date).

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 annual compliance report.

Monthly Compliance Report (COMPLIANCE-7)

The first Monthly Compliance Report is due one month following the Energy Commission business meeting date upon 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 five copies of the Monthly Compliance Report within 10 working days after the end of each reporting month. Monthly Compliance Reports shall be clearly identified for the month being reported. The reports shall contain, at a minimum:

1. a summary of the current project construction status, a revised/updated schedule if there are significant delays, and an explanation of any significant changes to the schedule;
2. documents required by specific conditions to be submitted along with the Monthly Compliance Report. Each of these items must be identified in the transmittal letter, and should be submitted as attachments to the Monthly Compliance Report;
3. an initial, and thereafter updated, compliance matrix showing the status of all conditions of certification and pre-construction and construction milestones (fully

satisfied conditions do not need to be included in the matrix after they have been reported as closed);

4. a list of conditions and milestones that have been satisfied during the reporting period, and a description or reference to the actions that 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 submitted to, 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 or milestones;
9. a listing of the month's additions to the on-site compliance file;
10. any requests 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 resolution of the resolved complaints, and the status of any unresolved complaints.

Annual Compliance Report (COMPLIANCE-8)

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 showing 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 submitted 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.

Confidential Information (COMPLIANCE-9)

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.

Annual Energy Facility Compliance Fee (COMPLIANCE-10)

Pursuant to the provisions of Section 25806(b) of the Public Resources Code, the project owner is required to pay an annual fee which may be adjusted annually. The initial payment is due on the date the Energy Commission adopts the final decision. All subsequent payments are due by July 1 of each year in which the facility retains its certification. The payment instrument shall be made payable to the California Energy Commission and mailed to: Accounting Office MS-02, California Energy Commission, 1516 9th St., Sacramento, CA 95814.

Reporting of Complaints, Notices, and Citations (COMPLIANCE-11)

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 complaints shall be responded to within 24 hours. The telephone number shall be posted at the project site and made easily visible to passersby during construction and operation. The telephone number shall be provided to the CPM who will post it on the Energy Commission's web page at:

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 monthly and annual compliance reporting requirements described above, the project owner shall report and provide copies to the CPM of all complaint forms, notices of violation, notices of fines, official warnings, and citations, within 10 days of receipt. 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

Planned Closure (COMPLIANCE-12)

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 12 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, and local/regional plans in existence at the time of facility closure, and applicable conditions of certification.

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.

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.

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.

Unplanned Temporary Closure/On-Site Contingency Plan (COMPLIANCE-13)

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 submit an on-site contingency plan for CPM review and approval. The plan shall be submitted no less than 60 days (or other time agreed to by the CPM) prior to commencement of commercial operation. The approved plan must be in place prior to commercial operation of the facility and shall be kept at the site at all times.

The project owner, in consultation with the CPM, will update the on-site contingency plan as necessary. The CPM may require revisions to the on-site contingency plan over the life of the project. In the annual compliance reports submitted to the Energy Commission, the project owner will review the on-site contingency plan, and recommend changes to bring the plan up to date. Any changes to the plan must be approved by the CPM.

The on-site contingency plan shall provide for taking immediate steps to secure the facility from trespassing or encroachment. In addition, for closures of more than 90 days, unless other arrangements are agreed to by the CPM, the plan shall provide for removal of hazardous materials and hazardous wastes, draining of all chemicals from storage tanks and other equipment, and the safe shutdown of all equipment. (Also see specific conditions of certification for the technical areas of **Hazardous Materials Management** and **Waste Management**.)

In addition, consistent with requirements under 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 12 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).

Unplanned Permanent Closure/On-Site Contingency Plan (COMPLIANCE-14)

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 and operation monitoring of the project, Energy Commission staff acts as, and has the authority of, the Chief Building Official (CBO). Energy

Commission staff may delegate CBO responsibility to either an independent third party contractor or the local building official. Energy 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.

Energy Commission staff may also seek the cooperation of state, regional and local agencies that have an interest in environmental protection 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.

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 construction or operation-related questions, complaints or concerns.

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 the Energy Commission to conduct an informal investigation of alleged noncompliance with the Energy Commission's terms and conditions of certification. All requests for informal investigations shall be made to the designated CPM.

Upon receipt of a request for informal investigation, the CPM shall promptly notify the project owner of the allegation by telephone and letter. All known and relevant information of the alleged noncompliance shall be provided to the project owner and to the Energy Commission staff. The CPM will evaluate the request and the information to determine if further investigation is necessary. If the CPM finds that further investigation is necessary, the project owner will be asked to promptly investigate the matter and within seven working days of the CPM's request, provide a written report to the CPM of the results of the investigation, including corrective measures proposed or undertaken. 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 proposed or 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 that 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 Energy Commission Chair, 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 (COMPLIANCE-15)

The project owner must petition the Energy Commission pursuant to Title 20, California Code of Regulations, section 1769, in order to modify the project (including linear facilities) design, operation or performance requirements, 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, 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 the project (including linear facilities) 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 may be authorized by the CPM as an insignificant project change pursuant to section 1769(a) (2). This process usually takes less than one month to complete, and it requires a 14-day public review of the Notice of Insignificant Project Change that includes staff's intention to approve the modification unless substantive objections are filed.

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.

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	

**GENERAL CONDITIONS TABLE 1
COMPLIANCE SECTION
SUMMARY of GENERAL CONDITIONS OF CERTIFICATION**

CONDITION NUMBER	SUBJECT	DESCRIPTION
COMPLIANCE-1	Construction Milestones	The project owner shall establish specific performance milestones for pre-construction and construction phases of the project.
COMPLIANCE-2	Access	The project owner shall grant Energy Commission staff and delegate agencies or consultants unrestricted access to the power plant site.
COMPLIANCE-3	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.
COMPLIANCE-4	Compliance Verification Submittals	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 or the project owner or his agent.
COMPLIANCE-5	Pre-construction Matrix and Tasks Prior to Start of Construction	Construction shall not commence until the all of the following activities/submittals have been completed: <ul style="list-style-type: none"> ▪ 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, ▪ the CPM has issued a letter to the project owner authorizing construction.
COMPLIANCE-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.
COMPLIANCE-7	Monthly Compliance Report including a Key Events List	During construction, the project owner shall submit Monthly Compliance Reports (MCRs) which include specific information. The first MCR is due the month following the Energy 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.

CONDITION NUMBER	SUBJECT	DESCRIPTION
COMPLIANCE-8	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.
COMPLIANCE-9	Confidential Information	Any information the project owner deems confidential shall be submitted to the Energy Commission's Dockets Unit.
COMPLIANCE-10	Annual fees	Payment of Annual Energy Facility Compliance Fee
COMPLIANCE-11	Reporting of Complaints, Notices and Citations	Within 10 days of receipt, the project owner shall report to the CPM, all notices, complaints, and citations.
COMPLIANCE-12	Planned Facility Closure	The project owner shall submit a closure plan to the CPM at least 12 months prior to commencement of a planned closure.
COMPLIANCE-13	Unplanned Temporary Facility Closure	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.
COMPLIANCE-14	Unplanned Permanent Facility Closure	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.
COMPLIANCE-15	Post-certification changes to the Decision	The project owner must petition the Energy Commission to delete or change a condition of certification, modify the project design or operational requirements and/or transfer ownership of operational control of the facility.

ATTACHMENT A

COMPLAINT REPORT/RESOLUTION FORM

PROJECT NAME: AFC Number:
COMPLAINT LOG NUMBER _____ Complainant's name and address: Phone number: _____
Date and time complaint received: Indicate if by telephone or in writing (attach copy if written): Date of first occurrence:
Description of complaint (including dates, frequency, and duration):
Findings of investigation by plant personnel: Indicate if complaint relates to violation of a CEC requirement: Date complainant contacted to discuss findings: _____
Description of corrective measures taken or other complaint resolution: Indicate if complainant agrees with proposed resolution: If not, explain: Other relevant information:
If corrective action necessary, date completed: _____ Date first letter sent to complainant: _____ (copy attached) Date final letter sent to complainant: _____ (copy attached)
This information is certified to be correct. Plant Manager's Signature: _____ Date: _____

(Attach additional pages and supporting documentation, as required.)

SAN FRANCISCO ELECTRIC RELIABILITY PROJECT

04-AFC-1

PREPARATION TEAM

Executive Summary	William Pfanner
Introduction	William Pfanner
Project Description	William Pfanner

Environmental Assessment

Air Quality	Tuan Ngo
Biological Resources	Susan D. Sanders
Cultural Resources	Beverly E. Bastian and Gary Reinoehl
Hazardous Materials Management	Alvin J. Greenberg, Ph.D. and Rick Tyler
Land Use	David Flores
Noise and Vibration	Steve Baker
Public Health	Alvin J. Greenberg, Ph.D.
Socioeconomic Resources	James Adams
Soil and Water Resources	Mark Lindley, Vince Geronimo and Philip Luecking
Traffic and Transportation	James Adams
Transmission Line Safety and Nuisance	Obed Odoemelam, Ph.D.
Visual Resources	Mark R. Hamblin, William Walters, P.E., and Lisa Blewitt
Waste Management	Alvin J Greenberg, Ph.D.
Worker Safety and Fire Protection	Alvin J. Greenberg, Ph.D. and Rick Tyler

Engineering Assessment

Facility Design	Shahab Khoshmashrab and Steve Baker
Geology and Paleontology	Patrick Pilling, Ph.D., P.E., G.E.
Power Plant Efficiency	Steve Baker

Power Plant Reliability Steve Baker
Transmission System EngineeringMark Hesters
Local System Effect Mark Hesters and Ajoy Guha
Alternatives Susan V. Lee
Compliance Monitoring and Facility Closure..... Christopher Meyer
Project SecretaryEvelyn Johnson

Declarations

&

Resumés

**DECLARATION OF
JAMES ADAMS**

I, **JAMES ADAMS** declare as follows:

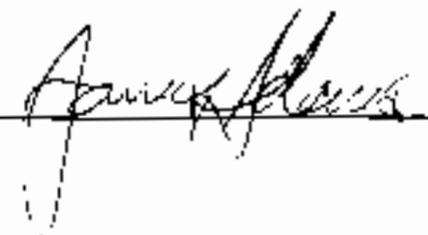
1. I am presently employed by the California Energy Commission in the **ENVIRONMENTAL OFFICE** of the Systems Assessments and Facilities Siting Division as a **ENVIRONMENTAL PLANNER**.
2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.
3. I helped prepare the staff testimony on **SOCIOECONOMICS**, for the **SAN FRANCISCO ELECTRIC RELIABILITY 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: February 2, 2002

Signed: _____

At: Sacramento, California



**DECLARATION OF
JAMES ADAMS**

I, **JAMES ADAMS** declare as follows:

1. I am presently employed by the California Energy Commission in the **ENVIRONMENTAL OFFICE** of the Systems Assessments and Facilities Siting Division as a **ENVIRONMENTAL PLANNER**.
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 **SAN FRANCISCO ELECTRIC RELIABILITY 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: February 9, 2006

Signed:



At: Sacramento, California

James S. Adams, M.A.
Environmental Protection Office
California Energy Commission
1516 Ninth Street
Sacramento, CA 95814-5504
PH (916) 653-0702, FAX (916) 651-8868
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, traffic and transportation, land use and visual resources. Work on special projects as requested.

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 Surfrider Foundation before the California Public Utilities Commission regarding decommissioning issues concerning Humboldt Bay, Diablo Canyon and San Onofre nuclear reactors.

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 legal/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 I served on the Board of Directors for two local 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 Phi Gamma 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:

1. 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.**
2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.
3. **I prepared the staff testimony on Efficiency, Reliability, and Noise and Vibration, and supervised preparation of the staff testimony on Facility Design and Geology and Paleontology, for the San Francisco Electric Reliability 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 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: 1/27/06 Signed: 

At Sacramento, California

STEVE BAKER, P.E.
Senior Mechanical Engineer

Experience Summary

Thirty-one 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, geology, paleontology and the mechanical, civil/structural and geotechnical engineering aspects of power plant siting cases. Key contributor to Commission's investigation into market impediments to the deployment of advanced high-efficiency generating technologies.

1987 to 1990--Generation Systems/Facility Design Unit Supervisor, Siting & Environmental Division - California Energy Commission

Responsible for supervising the analysis of generating capacity, reliability, efficiency, safety, and mechanical, civil/structural, and geotechnical engineering aspects of power plant siting cases.

1981-1986--Operations Manager, Alternate Energy - Santa Fe Pacific Realty Corporation

Participated in and supervised identification, evaluation and feasibility analysis, licensing and permitting of hydroelectric, geothermal, windpower and biomass power projects.

1974-1981--Mechanical Engineer, Quality Engineer - Bechtel Power Corporation and Bechtel National, Inc.

Wrote equipment specifications, drew flow diagrams and P&D'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 BEVERLY E. BASTIAN

I, Beverly E. Bastian, declare as follows:

1. I am presently employed by the California Energy Commission in the Facilities 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 **cultural resources** for the **San Francisco Energy Reliability** 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: 2/14/2016 Signed: Beverly E. Bastian

At: Sacramento, California

Beverly E. Bastian
1516 Ninth Street MS 401
Sacramento, CA 95814 5504
(916) 657-4541 email: hbastian@energy.state.ca.us

Education

School	Field	Degree	Year
University of California, Davis	Anthropology	B.A.	1967
University of California, Davis	Anthropology	M.A.	1969
Tulane University	Anthropology	A.B.D.	1975
University of Mississippi	American History	(courses only)	1989
University of California, Santa Barbara	Public (American) History and Historic Preservation	A.B.D.	1996

Experience

State of California, California Energy Commission 2005 to present
Planner II, Facilities Siting Division, Environmental Office, Biological and Cultural Unit.

All tasks related to the production of the cultural resources sections of CEQA-equivalent (California Environmental Quality Act) documents for the environmental review of proposed power plants in California, including: Evaluating data in applications, writing data requests to applicants and doing independent research to compile an inventory of and evaluate the historical/cultural significance of cultural resources subject to significant impacts from proposed projects; providing and receiving information in public hearings on applications; analyzing all pertinent data; writing Staff Assessments of impacts; developing mitigation measures to reduce to insignificant any impacts to significant cultural resources; providing expert testimony on my analyses and findings in public hearings; and reviewing compliance with mitigation measures during the construction, operation, and decommissioning of certified power plants. Additional tasks include: providing pre-filing assistance to applicants, reviewing the CEQA documents of sister state agencies; consulting and advising cultural resources specialists in sister state agencies; coordinating and reviewing the work of Commission cultural resources consultants, and developing internal procedures and guidelines to improve cultural resources review of applications.

State of California, Department of Parks and Recreation 2001 to 2005
Historian II, Cultural Resources Division, Cultural Resources Support Unit

Conduct major and complex historical and historic architectural investigations and studies dealing with the significance, integrity, and management of historic buildings, structures, and landscapes in California's state parks; participate in interdisciplinary teams and project assignments; prepare technical reports and correspondence; carry out inventories and evaluations of historic properties; coordinate the statewide registration of historical properties; assess the eligibility of historic properties to the National Register of Historic Places and the California Register of Historical Resources; review environmental documents and provide technical analyses of major Departmental projects to determine impacts to cultural resources under State and federal laws; identify resource issues and constraints; establish allowable use and development guidelines; develop approaches to protect, enhance, and perpetuate cultural resources under relevant State and federal laws, regulations, and standards; propose and develop programs, policies, and budgets to meet Department's historic preservation missions

Department of Sociology and Anthropology, University of Mississippi 1987 to 1989
Archaeologist, Center for Archaeological Research

All tasks for the completion of the historical archaeological part of a Phase II archaeological survey and testing program final report related to a U. S. Army Corps of Engineers erosion control project in twelve north-central Mississippi counties, including: Coordinating the activities of a field crew and the research

of historians working in archives, setting up an artifact database using survey data to generate statistical summaries for discovered historical archaeological sites, gathering historical settlement and land-use data for twelve counties; conducting a special statistical analysis and synthesis of historical data only, focusing on pre and post-Civil War land tenure and agricultural production for plantations in two counties where soil fertility contrasted, synthesizing data from all sources, collaborating on the final cultural resources management report with archaeologists specializing in prehistory and survey and sampling methodology; presenting findings at the annual meeting of the Society for Historical Archaeology in 1989.

Gilbert Commonwealth, Inc.

1984 to 1987

Historical Archaeologist and Project Manager, Environmental Unit

All tasks as Principal Investigator for six major historical archaeological and/or historical architectural cultural resources management projects done under contract to federal, state, and local governments, including: Writing winning proposals for these projects; negotiating and managing project budgets; gathering/supervising the gathering of historical, oral historical, and archaeological data; analyzing/supervising the analysis of gathered data; and writing/supervising the writing of reports of findings, along with the creation of maps, illustrations, and data tables for these reports; serving as the historian and historical preservationist on several multidisciplinary teams tasked with siting the routes for several major power lines in east Texas.

Tennessee Valley Authority

1979 to 1981, 1983-1984

Land & Economic Resources, Cultural Resources Program (personal services contract)

Historical Archaeologist (self-employed)

All tasks as Principal Investigator for various cultural resources management projects in areas affected by TVA construction, the most significant of which were: the complete excavation of and report on seven nineteenth-century log-cabin sites in Cedar Creek Reservoir in northwestern Alabama; and all historical research, the field work, and the report for the underwater remote-sensing reconnaissance and underwater videotaping of sunken Civil War cargo boats and gunboats at Johnsonville, Tennessee, in the western part of the Tennessee River.

Other Archaeological Projects

1981-1982 Project Director for the field excavation, historical research, data analysis, and report on Fort Independence, South Carolina (dating to the time of the Revolutionary War) for the U. S. Army Corps of Engineers.

1975-1978 Field Director for the total excavation of French-and-Indian-War-period Fort Loudoun in east Tennessee and laboratory supervisor of artifact conservation and analysis for this project at Vanderbilt University for the Tennessee Division of Archaeology.

1974 Archaeologist and Junior Investigator for intensive historical research and archaeological testing at the defunct 19th-century northeastern Alabama river town of Bellefonte, for the Department of Anthropology and Sociology, University of Alabama, Birmingham.

1973 Teaching Assistant for a summer archaeological Field School at historic Fort Southwest Point, dating to the War of 1812, Department of Anthropology, University of Tennessee

1967 Crew Foreman for a National Park Service sponsored salvage excavation project along the Delaware riverfront in Philadelphia, for the Department of American Civilization, University of Pennsylvania.

1966 Excavator and a laboratory technician for two California historic sites, Old Sacramento and Old Columbia, for the Department of Anthropology at the University of California, Davis

Professional Societies

Register of Professional Archaeologists, #10683
Society for Historical Archaeology
National Council on Public History

Vernacular Architecture Forum
Society for California Archeology
California Council for the Promotion of History

**DECLARATION OF
Lisa Blewitt**

I, **Lisa Blewitt**, declare as follows:

1. I am presently employed by Aspen Environmental Group, a contractor to the California Energy Commission, Systems Assessment and Facilities Siting Division, as an associate in engineering and physical sciences.
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 **Visual Resources (Visible Plume Modeling Analysis)**, for the **San Francisco Electric Reliability 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: January 30, 2006

Signed:



At: Agoura Hills, California

LISA A. BLEWITT
Associate Engineer/Physical Scientist

ACADEMIC BACKGROUND

B.S., Chemical Engineering, University of California, Santa Barbara, 1996

PROFESSIONAL EXPERIENCE

Ms. Blewitt is an Associate in Engineering and Physical Sciences with experience serving as project manager as well as deputy project manager for California Environmental Quality Act (CEQA) projects. In addition, Ms. Blewitt has four years of experience evaluating the potential impacts to the physical environment, particularly with regard to air quality, plume, noise, and hazards and hazardous materials associated with proposed infrastructure projects in compliance with CEQA and the National Environmental Policy Act (NEPA). Prior experience includes working as a process engineering doing refinery and power plant design.

Aspen Environmental Group

2001 to present

Ms. Blewitt's project experience at Aspen includes the following:

California Energy Commission (CEC) (2001-2003). Ms. Blewitt performed plume analysis and/or air quality analysis on several projects to support the Staff Assessments for the CEC's CEQA equivalent review process. She also helped manage the Aspen Team as Power Plant Coordinator (PPC). Coordination of the Aspen team with CEC project managers included providing up-to-date information to all members of the team, identifying key issues, and preparing monthly progress reports. She also managed the Aspen team as the overall Aspen PPC for all CEC projects by providing weekly progress reports to all Aspen PPCs. In addition to her work on the Staff Assessments for the CEC, Ms. Blewitt was also the Coastal Power Plant Inventory Coordinator for the Coastal Plant Study.

- **Avenal Energy Center.** AFC for 600 MW combined cycle plant located in Avenal, Kings County. Ms. Blewitt performed the plume analysis for the cooling tower, heat recovery steam generators (HRSGs), and auxiliary boiler.
- **Blythe Energy Project Phase II.** Aspen Team PPC to support the Staff Assessment of the AFC for a 520 MW combined cycle power plant located entirely within the previously approved Blythe Energy Project facility boundaries west of the City of Blythe, Riverside County. Ms. Blewitt performed the plume analysis for the cooling tower and HRSGs.
- **City of Vernon Combined Cycle.** AFC for the Malburg Generating Station (MGS), a 120 MW combined cycle power plant to be located in the City of Vernon, Los Angeles County. Ms. Blewitt performed the plume analysis for the cooling tower and HRSGs. She also performed a cooling tower plume ground level fogging analysis to determine impacts to surrounding roadways.
- **Colusa Power Project.** AFC for a 500 MW combined cycle power generation facility located west of the City of Williams in Colusa County. Ms. Blewitt assisted with the air quality analysis.

- **East Altamont Energy Center.** AFC for a 1,100 MW combined cycle power generation facility located southeast of Tracy in Alameda County. Ms. Blewitt assisted with the cooling tower plume analysis. She also performed a cooling tower plume ground level fogging analysis to determine impacts to surrounding roadways.
- **Henrietta Peaker Project.** AFC for a 91.4 MW simple cycle power plant to be located west of the City of Lemoore, in Kings County. Ms. Blewitt assisted with the air quality analysis and performed the plume analysis for the HRSGs. This plant did not require a cooling tower.
- **Inland Empire Energy Center.** AFC for a 670 MW combined cycle power plant to be located near the town of Romoland and Perris, within an unincorporated area of Riverside County. Ms. Blewitt performed the plume analysis for the cooling tower, HRSGs, and auxiliary boiler.
- **Los Esteros Critical Energy Facility.** Aspen Team PPC to support the Staff Assessment of the AFC for a 180 MW simple cycle peaking plant in San Jose, CA.
- **Magnolia Power Project.** AFC to add 250 MW of new generation at Magnolia Generation Power Plant in Burbank, CA. Ms. Blewitt assisted in the air quality analysis and performed the plume analysis for the cooling tower and HRSGs. She also performed a cooling tower plume ground level fogging analysis to determine impacts to surrounding roadways.
- **Modesto Irrigation District Electric Generation Station.** SPPE for a 95 MW simple cycle project located in Ripon, San Joaquin County. Ms. Blewitt assisted with the air quality analysis.
- **Roseville Energy Facility.** AFC for 900 MW combined cycle power plant five miles northwest of downtown Roseville in Placer County. Ms. Blewitt performed the plume analysis for the cooling towers.
- **Salton Sea Unit 6 Project.** Aspen Team Power Plant Coordinator to support the Staff Assessment of the AFC for 185 MW geothermal plant near Calipatria, Imperial County. Ms. Blewitt assisted with the air quality analysis and performed the plume analysis for the cooling tower and dilution water heaters.
- **San Joaquin Valley Energy Center.** Aspen Team PPC to support the Staff Assessment of the AFC for a 1,060 MW combined cycle power generation facility located in the City of San Joaquin, Fresno County. Ms. Blewitt assisted with the air quality analysis, and performed the plume analysis for the cooling tower, HRSGs, and auxiliary boiler. She also performed a cooling tower plume ground level fogging analysis to determine impacts to surrounding roadways.
- **SMUD Cosumnes Power Plant Project.** AFC for 1000 MW combined cycle power plant to be located at the Rancho Seco Nuclear Power Plant in Sacramento County. Ms. Blewitt performed the plume analysis for the cooling towers and HRSGs.
- **Tracy Peaker Power Plant Project.** Aspen Team PPC to support the Staff Assessment of the AFC for a 169 MW simple cycle power plant to be located southwest of the City of Tracy, in western San Joaquin County. Ms. Blewitt also assisted with the air quality analysis and performed the plume analysis based on results from Spartan I Energy Center Project.
- **Turlock Irrigation District Walnut Energy Center.** AFC for a 250 MW combined cycle power plant located in Turlock, Stanislaus County. Ms. Blewitt assisted with the air quality analysis and performed the plume analysis for the cooling tower and heat recovery steam generator.
- **Coastal Plant Study.** Ms. Blewitt was the Coastal Power Plant Inventory Coordinator for this special study conducted as part of Aspen's contract with the CEC. As Inventory Coordinator her responsibilities included collection of plant data and permits, coordinating and summarizing all data collected. The intent of the study is to provide sufficient background information to help identify red flag items for the CEC in order to streamline future licensing processes.

California Public Utilities Commission (CPUC) (2005). Ms. Blewitt is assisting in the alternatives analysis for this EIR/EIS, where the proposed project would include building a new 25.6-mile 500-kV transmission line between Southern California Edison's existing Antelope and Pardee Substations, which are located in Lancaster and Santa Clarita, California, respectively. The proposed route would traverse Angeles National Forest generally within the existing Saugus-Dei Sur transmission corridor.

California Department of Water Resources (DWR). Ms. Blewitt performed various environmental analyses for the following projects:

- **Tehachapi East Afterbay Project (2003-2004).** Initial Study/Environmental Impact Report (IS/EIR) to construct a reservoir near the bifurcation of the East Branch and West Branch of the California Aqueduct, nine miles east of Corral, California. The project would provide additional storage to the existing Tehachapi Afterbay to enable enhanced peaking operation of upstream pumping plants and increased operational flexibility. Ms. Blewitt acted as the Deputy Project Manager for the IS/EIR. She prepared the project description and performed the environmental analysis for air quality, cultural resources, geology/soils, hazards/hazardous materials, noise, transportation/traffic, and utilities/service systems for the Initial Study (Tehachapi Second Afterbay). It was decided to move the proposed reservoir and redesigned the project to reduce escalating costs associated with the original design. Ms. Blewitt prepared the Notice of Preparation (NOP) for the Tehachapi East Afterbay (TEA) Project, prepared the executive summary and project description, and assisted with the air quality analysis for the EIR. Ms. Blewitt also prepared the Final EIR, Statement of Findings, and Statement of Overriding Considerations for the TEA Project.
- **Pyramid Dam Emergency Access Road (PDEAR) (2005).** As Project Manager, Ms. Blewitt is managing the preparation of a Biological Evaluation/Biological Assessment (BE/BA), Initial Study and Mitigated Negative Declaration in compliance with CEQA, and obtaining the required environmental permits for an emergency access road. DWR proposes to build an emergency access road to Pyramid Dam in northwestern Los Angeles County, California, in the Angeles National Forest. The purpose of the emergency access road would be to provide full and adequate access to Pyramid Dam in the event of an emergency (dam failure and/or leakage), and for required periodic inspections and maintenance.

Los Angeles Department of Water Resources (LADWP) (2004-2005). Ms. Blewitt is serving as the Deputy Project Manager for the Lower Reach River Supply Conduit Project. She assisted with the preparation of the IS/EIR for this 7.1 mile water pipeline project, which will be located in public street rights-of-way, LADWP property, and LADWP utility easements in the communities of Silver Lake and Los Feliz (including Griffith Park) in the City of Los Angeles. For the IS, Ms. Blewitt prepared the project description, cultural resources, and hazards and hazardous materials discussions. A Draft EIR was prepared for the project in May 2005, focusing on air quality, noise, and traffic impacts.

U.S. Army Corps of Engineers (Corps). Ms. Blewitt performed various environmental analyses for the following projects:

- **Murrieta Creek (2003).** Supplemental Environmental Assessment/Environmental Impact Report Addendum to assess the differences in impacts resulting from implementation of the Modified Phase I Plan (as compared with the impacts of the Original Phase I Plan addressed in the 2000 EIS/EIR). The project involved improvements to Murrieta Creek that extend from the 1st Street Bridge in Temecula, California downstream to just north of the USGS stream gage, which is located just upstream of Murrieta Creek's confluence with Temecula Creek at the headwater of the Santa Margarita River. Ms. Blewitt performed the environmental analysis for public health and safety and utilities and public services.

- **Matilija Dam (2003-2004).** Environmental Impact Statement and Environmental Impact Report (EIS/EIR) prepared to analyze and disclose the potential environmental effects associated with the proposed Matilija Dam Ecosystem Restoration Feasibility Study. Ms. Blewitt performed the noise analysis for the various project alternatives.
- **Joint Red Flag '05 Exercise (2004-2005).** Environmental Assessment to analyze the impacts associated with the ground component of the Joint Red Flag '05 Exercise which would be performed on Bureau of Land Management (BLM) lands surrounding Nellis Air Force Base in Lincoln County, Nevada. Ms. Blewitt attended the site visits; and performed the noise, transportation, public health and safety (hazardous materials), and utilities analyses
- **Fort Irwin EBS (2005).** Environmental Baseline Survey (EBS) report on the Russell Soller Property near Fort Irwin, San Bernardino County, California to support the purchase of the site by the U.S. Army for the Fort Irwin National Training Center. Ms. Blewitt was the Deputy Project Manager assisting in the development of the EBS. Specifically, Ms. Blewitt conducted site investigations, prepared the project description, and reviewed the potential hazards on the site.
- **Murrieta Creek Water Quality Monitoring (2005).** The Corps of Engineers is constructing a flood control, ecosystem restoration and recreation project. Phase 1 of this construction project is currently occurring along an approximately one mile portion of Murrieta Creek between Highway 79 South and 1st Street. Best Management Practices applied to the project failed to provide adequate erosion and sediment control, resulting in violations of the State Water Resources Control Board Order No. 99-08-1DWQ, *National Pollutant Discharge Elimination System No. CA000002, Waste Discharge Requirements for Discharges of Storm Water Runoff Associated with Construction Activity*. As Project Manager, Ms. Blewitt is managing the water quality monitoring efforts to comply with Section 401 Water Quality Certification conditions, the Notice of Violation and Cleanup and Abatement Order letters received from the California Regional Water Quality Control Board Region 9

Fluor Daniel, Inc.

1996 to 2001

Ms. Blewitt was a Process Engineer at Fluor Daniel, Inc. in Aliso Viejo, CA, from August 1996 to July 2001. She did process design work for both refineries and power plants.

MODELS

- Seasonal/Annual Cooling Tower Impact (SACTI) Model
- Combustion Stack Visible Plume (CSVP) Model
- FHWA Traffic Noise Model²
- BFAST for Windows (BEE-Line Software's ISC/ST3/SCREEN3 modeling manager)

ADDITIONAL TRAINING AND COURSES

- Engineer-In-Training Certificate, October 1996
- UCSB Extension 2-day class – Preparing CEQA/NEPA Documents, January 2002
- UCSB Extension Project Management Professional Certification Program, June 2003
- BEE-Line Software 2-day course – PERMITS: Modeling for State and Federal Permit Applications Using RPIP/BPIP-Prime, AerMod, ISC-Prime & ISCST3 (BFAST software package), November 2003

DAVID FLORES

WORK EXPERIENCE

Sept. 1998
to Present

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, visual and traffic and transportation resources. Specific tasks include the analysis of potential impacts, identification of suitable mitigation measures, preparation of testimony, and project monitoring to ensure compliance with local, state and federal environmental laws and regulations.

March 29, 1988

to September 12, 1998

Senior Planner. County of Yolo Planning and Public Works Department

Senior Planner - Current and Advanced Planning (Resources Management and Planning)

Present responsibilities include the following:

Administer the establishment of Planning schedules and timeframe completion schedules; Administration and staff support to Planning Commission and Board of Supervisors; Staff support and liaison to citizen's committees. Preparation of Environmental documents (Negative Declarations, preparation of Environmental Impact Reports and Categorical Exemptions) in accordance with State and Federal Regulations.

PLANNING ACHIEVEMENTS

- Principal staff involved in development of the County Right to Farm and Williamson Act/ Blue Ribbon Ordinances.
- Staff liaison to citizen committees for the communities of Yolo County
- Substantial experience in working successfully with community organizations and committees on controversial projects.
- Responsible for the administration of the California Environmental Quality Act (CEQA) for all matters going before the Planning Commission and Board of Supervisors.

EDUCATION

California State University @ Sacramento
University of California @Davis
Major: Environmental Studies
Minor: Business Administration

Continuing education has included: Writing for Managers, CEQA Updates, Managing the Office, CEQA Update, Subdivision Map Act, General Plan Update

DECLARATION OF DAVID FLORES

1, David Flores declare as follows:

1. I am presently employed by the California Energy Commission in the Facilities Siting Office of the Systems Assessments and Facilities Siting Division as a Planner 2.
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 San Francisco Energy Reliability 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: January 26, 2006

Signed: 

At: Sacramento, California

DECLARATION OF
Alvin J. Greenberg, Ph.D.

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

1. I am presently a consultant to the California Energy Commission. Energy Facilities Siting and Environmental Protection Division.
2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.
3. I helped prepare the staff testimony on **Hazardous Materials Management, Public Health, Waste Management, and Worker Safety/Fire Protection** sections for the **San Francisco Energy Reliability** 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:

Jan. 31, 2006

At:

Sacramento, California

Signed:



Risk Science Associates

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

415-479-7560 fax 415-479-7563

e-mail agreenberg@risksci.com

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

Dr. Greenberg has had over two decades of complete technical and administrative responsibility as a team leader for hazardous waste site characterization, preparation of human and ecological risk assessments, air quality assessments, interaction with regulatory agencies in obtaining permits, hazardous materials handling and risk management prevention, infrastructure vulnerability assessments, conducting lead surveys and studies, with particular expertise in the assessment of dioxins, lead, diesel exhaust, petroleum hydrocarbons, mercury, and the intrusion of subsurface contaminants into indoor air. Dr. Greenberg's expertise in risk assessment has led to his appointment as a member of several state and federal advisory committees, including the California EPA Advisory Committee on Stochastic Risk Assessment Methods, the US EPA Workgroup on Cumulative Risk Assessment, the Cal/EPA Peer Review Committee of the Health Risks of Using Ethanol in Reformulated Gasoline, the California Air Resources Board Advisory Committee on Diesel Emissions, the Cal/EPA Department of Toxic Substances Control Program Review Committee, and the DTSC Integrated Site Mitigation Committee. Dr. Greenberg is the former Chair of the Bay Area Air Quality Management District Hearing Board, a former member of the State of California Occupational Health and Safety Standards Board (appointed by the Governor), and former Assistant Deputy Chief for Health, California OSHA. And, since the events of 9/11, Dr. Greenberg has been the lead person for developing vulnerability assessments, power plant security programs, and conducting safety and security audits of power plants for the California Energy Commission. In addition to providing security expertise to the State of California, Dr. Greenberg is Team Leader and main consultant to the State of Hawaii on the updating of their Energy Emergency Preparedness Plan.

Years Experience: 25

Education:

B.S. 1969 Chemistry, University of Illinois Urbana

Ph.D. 1976 Pharmaceutical/Medicinal Chemistry, University of California, San Francisco

Postdoctoral Fellowship 1976-1979 Pharmacology/Toxicology, University of California, San Francisco

Postgraduate Training 1980 Inhalation Toxicology, Lovelace Inhalation Toxicology Research Institute, Albuquerque, NM

Professional Registrations:

Board Certified as a Qualified Environmental Professional (QEP)
California Registered Environmental Assessor - I (REA)
Fellow of the American Institute of Chemists (FAIC)

Professional Affiliations:

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

Technical Boards and Committee Memberships - Present:

Squaw Valley Technical Review Committee
(appointed 1986)

Technical Boards and Committee Memberships - Past:

July 1996 - March 2002
Member, Bay Area Air Quality Management District Hearing Board
(Chairman 1999-2002)

September 2000 - February 2001
Member, State Water Resources Control Board Noncompliant Underground
Tanks Advisory Group

January 1999 - June 2001
Member, California Air Resources Board Advisory Committee on Diesel
Emissions

January 1994 - September 1999
Vice-Chairman, State Water Resources Control Board Bay Protection and Toxic
Cleanup Program Advisory Committee

September 1998
Member, US EPA Workgroup on Cumulative Risk Assessment

April 1997 - September 1997
Member, Cal/EPA Private Site Manager Advisory Committee

January 1986 - July 1996
Member, Bay Area Air Quality Management District Advisory Council
(Chairman 1995-96)

January 1988 - June 1995
Member: California Department of Toxic Substance Control Site Mitigation
Program Advisory Group

January 1989 - February 1995
Member: Department of Toxic Substances Control Review Committee, Cal-EPA

October 1991 - February 1992

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

September 1990 - February 1991

Member, California Integrated Waste Management Board Sludge Advisory Committee

September 1987 - September 1988

ABAG Advisory Committee on Regional Hazardous Waste Management Plan

March 1987 - September 1987

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

January 1984 - October 1987

Member, San Francisco Hazardous Materials Advisory Committee

March 1984 - March 1987

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

Jan. 1, 1986 - June 1, 1986

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

Jan. 1, 1983 - June 30, 1985

Member, Contra Costa County Hazardous Waste Task Force

Sept. 1, 1982 - Feb. 1, 1983

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

Present Position

January 1983- present

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

Previous Positions

Jan. 2, 1983 - June 12, 1984

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

Aug. 1, 1979 - Jan. 2, 1983

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

Feb. 1, 1979 - Aug. 1, 1979

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

Jan. 1, 1976 - Feb. 1, 1979

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

Jan. 1, 1975 - Dec. 31, 1975

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

Experience

General

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

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

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

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

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

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

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

Mercury Contamination

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

Examples

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

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

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

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

Air Pathway Analysis

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

Examples

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Infrastructure Security

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

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

Sites with RWQCB and/or DTSC Oversight

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

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

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

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

Examples

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Military Bases

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

Examples

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

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

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

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

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

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

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

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

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

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

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

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

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

Examples

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Examples

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

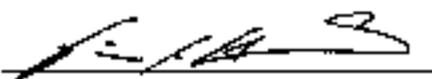
- Valero Refinery Cogeneration Project, Benicia, Ca., 2001: hazardous materials, worker safety/fire protection
- Ocotillo Energy Project, Palm Springs, Ca., 2001: hazardous materials, worker safety/fire protection
- Gilroy Energy Center Phase II Project, Gilroy, Ca., 2001-2: hazardous materials, worker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

DECLARATION OF VINCE GERONIMO

I, **Vince Geronimo** declare as follows:

1. I am presently employed as a consultant by the California Energy Commission in the Facilities Siting Office of the Systems Assessments and Facilities Siting Division.
2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.
3. I helped prepare the staff testimony on **Soil and Water Resources** for the San Francisco Energy Reliability 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: 2/14/06 Signed: 

At: San Francisco, California

Vince C. Geronimo

Senior Associate

Vince Geronimo has actively managed the study and design of water resources projects as a Professional Engineer and Project Manager since 2001. Mr. Geronimo has ten years of engineering design experience and has practiced within all project phases from initial research, conceptual development, alternatives analysis, final design, bid process, through construction. Mr. Geronimo has a wide range of experience performing hydrologic analyses and hydraulic modeling for many watershed-river regimes. His project experience covers channel restoration, storm sewer design, outfall systems planning, water transmission and storage analysis, sediment transport, erosion control planning, design of hydraulic structures, as well as development-related civil engineering efforts. Mr. Geronimo has spent time in the field observing construction and providing construction administration for projects of his design. He maintains a clear understanding of the project goals throughout the project-life and during implementation and provides integrated engineering solutions for water resources projects that require diverse evaluation.

Education

M.S., 2004 Civil Engineering, Water Resources Emphasis,
University of Colorado - Denver, Colorado

B.S., 1995 Civil Engineering, Environmental Emphasis,
Southern Illinois University - Edwardsville, Illinois

Professional Registration

Professional Engineer, State of Colorado, 35224
Applicant for Comity, State of California

Certifications

Certified Floodplain Manager, Certificate No. US-02-00543, Association of State Floodplain Managers

Memberships

American Society of Civil Engineers
Association of State Floodplain Managers
Floodplain Managers Association
Engineers Without Borders – San Francisco Professionals

Selected Project Experience

Inland Empire Energy Center; Romoland, CA Current. PWA Senior Associate provided environmental review of a proposed power plant in Romoland for the California Energy Commission. The environmental review was focused on the impacts to soil and water use. Specific analyses included assessing potential flooding, water quality impacts related soil erosion, and the Storm Water Pollution Prevention Plan and storm water best management practices.

San Francisco Electric Reliability Project; San Francisco, CA Current. PWA Senior Associate provided environmental review of a proposed power plant in San Francisco for the California Energy Commission. The environmental review was focused on the impacts to soil and water use. Specific analyses included assessing potential SF Bay flooding, assessment of a treatment facility to treat wastewater to Title-22 quality, recycled water usage, water quality impacts related soil erosion, and review of the Storm Water Pollution Prevention Plan and storm water best management practices.

Lake Sonoma Water Diversion; Sonoma County, CA 2005, PWA Project Manager to study feasibility of diverting water from Lake Sonoma, to the Russian River. The purpose of the analysis was for an EIR scoping process. Mr. Geronimo performed a reconnaissance level, engineering evaluation and provided an approximate cost to deliver 26,000 acre-feet of water from Lake Sonoma to the Russian River. The summary cost estimate included: facilities cost, approximate electrical demand engineering costs as percentage of facilities cost.

**Selected
Project
Experience**
(Continued)

FEMA Flood Insurance Restudies, Independent QA/QC Review; Region IX, CA Present, PWA Project Manager responsible for executing an independent Quality Assurance / Quality Control review of updates to FEMA FIS and FIRMs. Required development of a QC Plan and checklist to review the technical components of the Restudy, including: Topography, Hydrology, Hydraulics, and Mapping.

Leona Quarry Development; Alameda County, CA 2005, PWA Project Manager responsible for review of the site design documents including: storm sewer design, erosion control measures, detention storage measures, water quality, and other Best Management Practices.

Hamilton Army Airfield Restoration: Seasonal Wetlands Design – Novato, CA 2005. PWA Senior Hydraulic Engineer providing hydraulic structure design recommendations to connect tidal flooding to the development of a 200-acre tidal wetland complex.

Poggi Canyon Creek Channel Remediation; San Diego County, CA 2004-Present, PWA Project Manager for the stream geomorphic analysis and hydraulic analysis to recommend channel treatments to stabilize an actively eroding urban drainageway. Project involved identifying the existing geomorphic conditions and providing the design of step-pool grade control measures to stabilize the eroding reach.

San Benito Sediment Transport Study; San Benito County, CA 2005, PWA Project Manager for the sediment transport analysis of the lower San Benito River. Conducted field analysis, sampling, and calculations using HEC-6T to determine the deliverable sediment rates to the receiving waterway, the Pajaro River.

**Selected
Project
Experience**
(Prior to PWA)

Eastern Hills Master Drainage Study; Aurora, CO 2000-2001 Stantec Project Manager developed the outfall planning study for 3400 acres of community development that included historic analysis, estimating developed basin hydrographs using CUHP, flood routing using SWMM to link 19 regional storage facilities with the capacity for 265 acre-feet, sized major structures, and provided the conceptual plan for two major tributaries passing through the site. An overall conceptual sediment and erosion control analysis was developed for the site to estimate BMP implementation costs.

High Plains Master Drainage Study; Aurora, CO 2001 Stantec Project Manager developed the master drainage plan for 640 acres of residential and golf course development. The study included SWMM routing analysis for the historic conditions and modeling the developed conditions with three regional water quality and detention ponds to attenuate the peak flood.

Green Acres Tributary Project Review; Douglas County/Arapahoe County, CO 2003 Stantec Project Manager providing a peer review of the final drainageway construction drawings, hydraulic analysis report, erosion control report, and temporary easement request.

Tallyn's Gulch, Stream and Bank Stabilization; Aurora, CO, 2001-2003 Stantec Project Engineer during the design phase of the project and Project Manager for the construction of the project. Provided construction management and design for stream stabilization, bank stabilization, in-line drainage facility, impact stilling basin design, and conceptual drainage design for adjacent development parcels. Project required EPA and ACOE involvement, wetland mitigation, and a 404 Individual Permit due to Waters of the US and jurisdictional wetlands.

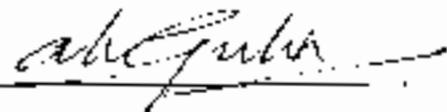
**DECLARATION OF
AJOY GUHA**

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

1. I am presently employed by the California Energy Commission in the **Transmission System Engineering unit** of the Systems Assessments and Facilities Siting as an Associate Electrical Engineer.
2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein
3. I helped prepare the staff testimony on **Local System Effect**, for the **San Francisco Electric Reliability 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: 2-10-06

Signed: 

At: Sacramento, California

RESUME

AJOY GUHA

*Associate Electrical Engineer
California Energy Commission
1516 Ninth Street, MS 46
Sacramento, CA 95814*

EDUCATION:

MSEE, POWER SYSTEMS ENGINEERING, PURDUE UNIVERSITY, INDIANA
BSEE, ELECTRICAL ENGINEERING, CALCUTTA UNIVERSITY, INDIA

CERTIFICATIONS:

REGISTERED PROFESSIONAL ENGINEER, CALIFORNIA, INDIANA & ILLINOIS
MEMBER OF IEEE; MEMBER OF THE INSTITUTION OF ENGINEERS OF INDIA

SUMMARY OF PROFESSIONAL BACKGROUND:

Ajoy Guha, P. E. has years of electric utility experience with an extensive background in evaluating and determining current and potential transmission system reliability problems and their cost effective solutions. He has a good understanding of the transmission issues and concerns. He is proficient in utilizing computer models of electrical systems in performing power flow, dynamic stability and short circuit studies, and provide system evaluations and solutions, and had performed generator interconnection studies, area transfer and interconnected transmission studies, and prepared five year transmission alternate plans and annual operating plans. He is also experienced in utilizing Integrated Resource Planning computer models for generation production costing and long term resource plans, and had worked as an Executive in electric utilities and experienced in construction, operation, maintenance and standardization of transmission and distribution lines.

WORK EXPERIENCE:

CALIFORNIA ENERGY COMMISSION, ENERGY FACILITIES SITING AND ENVIRONMENTAL DIVISION, SACRAMENTO, CA. 11/2000-Present.

Working as Associate Electrical Engineer in the Transmission System Engineering unit on licensing generation projects. Work involves evaluating generation interconnection studies and their impacts on transmission system, and providing staff assessments and testimony to the commission, and coordination with utilities and other agencies.

ALLIANT ENERGY, DELIVERY SYSTEM PLANNING, MADISON, WI, 4/2000-9/2000.

Worked as Transmission Services Engineer, performed Generator Interconnection studies and system planning studies.

IMPERIAL IRRIGATION DISTRICT, POWER DEPT., Imperial, California, 1985-1998.

Worked as Senior Planning Engineer in a supervisory position and in Transmission, Distribution and Integrated Resource planning areas. Performed interconnection studies for 500 MW geothermal plants and developed plan for a collector system, developed methodologies for transmission service charges, scheduling fees and losses. Worked as the Project Leader in the 1992 Electricity Report (ER 92) process of the California Energy Commission. Worked as the Project Leader for installation of an engineering computer system and softwares. Assumed the Project Lead in the standardization of construction and materials, and published construction standards.

CITY LIGHT & POWER, Frankfort, Indiana, 1980 – 1985.

Worked as Assistant Superintendent and managed engineering, construction and operation depts.

WESTERN ILLINOIS POWER CO-OP., Jacksonville, Illinois, 1978 – 1980.

Worked as Planning Engineer and was involved in transmission system planning.

THE CALCUTTA ELECTRIC SUPPLY CORPORATION LTD. (CESC), Calcutta, India, 1964 –1978.

Worked as District Engineer and was responsible for managing customer relations, purchasing and stores, system planning, construction, operation and maintenance departments of the most industrialized Transmission and Distribution division of the Utility. Worked as PROJECT MANAGER for construction of a 30 mile Double Circuit 132 kV gas-filled Underground Cable urban project. During 1961-63, worked as Factory Engineer for design, manufacturing and testing of transformers, motor starters and worked in a coal-fired generating plant.

DECLARATION OF

Mark R. Hamblin

I, Mark R. Hamblin 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 Planner II.

A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

I prepared the Visual Resources section in the Final Staff Assessment for the San Francisco Energy Reliability Project – Supplement A based on my independent analysis and supplement(s) 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: February 10, 2006 Signed: Mark R. Hamblin

At: Sacramento, California

MARK R. HAMBLIN

Summary

Public administrator/land use planner with 15 years experience addressing land use development matters of concern to citizens and government leaders. Expertise in interpreting public policy pertaining to land use and environmental assessment. Demonstrated ability in working with individuals, and on teams involved in the development permitting process.

Professional Experience

California Energy Commission, Sacramento, CA.

Planner II

November 2000 to present.

Prepares an independent technical analysis in the area(s) of land use, traffic & transportation, and visual resources to inform interested persons and to make recommendations to the Energy Commission regarding the consequences of a natural gas fired power generation plant proposal; reviews information provided by the applicant and other sources to assess the environmental effects of a proposal as required by the California Environmental Quality Act (CEQA), and the California Energy Commission siting regulations; evaluates project in accordance with federal, state and local laws, ordinances, regulations, standards (LORS); coordinates proposal with federal, state and local agencies; conducts field studies; oversees technical consultant(s), participates in public workshop(s) on proposal; presents sworn testimony during evidentiary hearings; implements compliance monitoring programs for projects approved by the Energy Commission to ensure that power plants are constructed and operated according to the conditions of certification of their license.

Yolo County Planning and Public Works Department, Woodland, CA.

Associate Planner

June 1992 to October 2000.

Advised and assisted individuals in the processing of land use requests (general plan amendments, conditional use permits, subdivision maps, etc.); reviewed information provided by the applicant and other sources for consistency with the state zoning and planning law, the county General Plan, the county government code, and the requirements of the CEQA; collected and analyzed information pertaining to a land use request and presented it in a staff report for consideration by the county planning commission and/or county board of supervisors; board of supervisors liaison, and planning department staff person to citizen and inter-agency committees (county airport advisory committee, county habitat conservation plan steering committee, and community general plan citizen advisory committee(s)); drafted zoning ordinances and regulations; prepared environmental assessment documents in accordance with CEQA and NEPA (National Environmental Protection Act); hired and supervised consultants; executed county zoning administrator duties; conducted zone code enforcement, reviewed building plans for issuance of permits; answered questions at the public counter, or on the telephone regarding land use issues and development proposals in the County.

Yolo County Community Development Agency, Woodland, CA.

Assistant Planner

January 1991 to June 1992.

Advised and assisted individuals in the processing of land use requests; reviewed information provided by the applicant and other sources for consistency with the county

General Plan, the state and county government code, and the requirements of CEQA; collected and analyzed information pertaining to a land use request and presented it in a staff report for consideration by the county planning commission; drafted zoning ordinances; prepared environmental assessment documents in accordance to the CEQA; supervised consultants; conducted zone code enforcement; reviewed building plans for issuance of permits; answered questions at the public counter, or on the telephone regarding land use and development in the County.

Tulare County Planning and Development Department, Visalia, CA.

Planning Technician II

March 1988 to January 1990.

Advised and assisted individuals in the processing of land use requests, specifically special-use permits, variances, parcel and subdivision maps; reviewed information provided by the applicant and other sources for consistency with the county General Plan, the state and county government code, and the requirements of CEQA; collected and evaluated information for presentation in a staff report on the proposed land use request for consideration by the county zoning administrator, site plan review committee, or planning commission; prepared environmental assessment documents in accordance with CEQA; conducted zone code enforcement, reviewed building plans for issuance of permits; answered questions at the public counter, or on the telephone regarding land use and development in the County.

Education

University of California, Davis Extension. Coursework in California Land Use Planning and the California Environmental Quality Act 1988 to 1995.

Cosumnes River College Coursework in Television and Radio Broadcasting 1990 to 1991.

California State University, Bakersfield. Master of Public Administration; August 1988 Concentration in Public Policy. Coursework in Business Administration and Political Science.

California State University, Sacramento. Bachelor of Science in Public Administration; May 1984. Concentration in Human Resources Management.

Porterville College. Associate in Arts Social Science, May 1982 Coursework in Administration of Justice.

Awards

2001 Superior Accomplishment Award - Recognition of outstanding performance and contribution as a Team Member of the "21 Day, 4, 6, and 12 Month Processes Team." California Energy Commission.

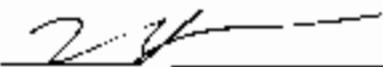
2001 Superior Accomplishment Award - Recognition of outstanding performance and contribution as a Team Member of the "Expedited 4 Month AFC/SPPE Team," California Energy Commission.

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 Systems Assessments and Facilities Siting Division as a Senior Electrical Engineer.
2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.
3. I helped prepare the staff testimony on **Transmission System Engineering and Local Systems Effects** for the San Francisco Energy Reliability 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: 1/25/06 Signed: 

At: Sacramento, California

Mark Hesters
Associate Electrical Engineer

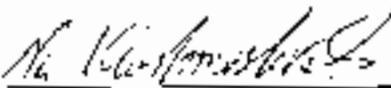
Mark Hesters has fourteen years of experience in electric power regulation. He worked in the Engineering Office of the California Energy Commission's Energy Facilities Siting & Environmental Protection Division since 1998 providing analysis of California transmission systems and testimony on transmission 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.

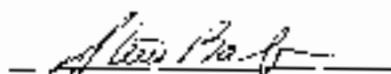
**DECLARATION OF
Shahab Khoshmashrab and Steve Baker**

We the undersigned, declare as follows:

1. We are presently employed by the California Energy Commission in the **Engineering Office** of the Systems Assessment and Facility Siting Division as **Mechanical Engineer-Mr. Khoshmashrab** and **Senior Mechanical Engineer-Mr. Baker**.
2. Copies of our professional qualifications and experience are attached hereto and incorporated by reference herein.
3. We prepared our respective portions of the Staff Testimony on **Facility Design**, for the **San Francisco Electric Reliability Project** based on our independent analysis of the Application for Certification and supplements thereto, data from reliable documents and sources, and our professional experience and knowledge.
4. It is our professional opinion that the prepared Testimony is valid and accurate with respect to the issues addressed therein.
5. We are personally familiar with the facts and conclusions related in the testimony and if called as witness(es) could testify competently thereto.

We declare under penalty of perjury that the foregoing is true and correct to the best of our knowledge and belief

Shahab Khoshmashrab 

Steve Baker 

Dated: January 27, 2006

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 SUSAN V. LEE

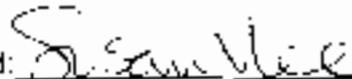
I, Susan V. Lee, declare as follows:

1. I am presently employed by Aspen Environmental Group, consultant to the California Energy Commission's Facilities Siting Office of the Systems Assessments and Facilities Siting Division as a Senior Associate.
2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.
3. I helped prepare the staff testimony on **Alternatives** for the San Francisco Energy Reliability 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: February 10, 2006

Signed: _____



At: Sacramento, California

SUSAN V. LEE
Vice President, San Francisco Operations

ACADEMIC BACKGROUND
M.S., Applied Earth Science, Stanford University, 1984
B.A., Geology, Oberlin College, 1977

PROFESSIONAL EXPERIENCE

Ms. Lee has over 20 years of technical and managerial experience in environmental assessment, and she currently manages Aspen's San Francisco Office. Her expertise is in management of environmental assessment for energy projects (pipelines, transmission lines, and electric power plants) under both the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA). Prior to employment at Aspen, Ms. Lee worked for 10 years with the Federal government (the U.S. Minerals Management Service (MMS) and the U.S. Geological Survey (USGS)). As a geologist and team leader at the USGS and MMS, she worked extensively with land use planning issues and offshore oil and gas exploration and development, including planning, regulatory enforcement, and environmental review.

Aspen Environmental Group

1993 to present

Ms. Lee has contributed to both technical and project management aspects of Aspen's environmental projects, including the following:

- **Jefferson-Martin 230 kV Transmission Line Project.** Ms. Lee managed preparation of an EIR for PG&E's proposed 27-mile transmission line through scenic San Mateo County in the Highway 280 corridor, urban Colma and Daly City, and across San Bruno Mountain for the California Public Utilities Commission (CPUC). This controversial and high profile project is considered to be an essential component of San Francisco's energy supply, and involved coordination with numerous local and regional jurisdictions. The Final EIR for this project was awarded the first place in the Outstanding Environmental Analysis Document competition by the Association of Environmental Professionals (April 2004). Major components of this project include the following:
 - The Draft EIR was published in July 2003, and over 800 pages of comments were submitted. The 2,600 page, three-volume Final EIR included responses to all comments and was published in November 2003.
 - A Supplemental Alternatives analysis was prepared in June of 2004 in response to the Assigned Commissioner's Ruling, requiring analysis of two additional alternatives.
 - Ms. Lee managed a team of Aspen staff specialists supplemented by experts with 8 subcontractor firms. Key issues were geology (the route closely follows the San Andreas Fault), transmission design and regional transmission planning, visual resources and recreation, and biological resources.
 - The EIR included a 200-page Alternatives Screening Report (as an EIR Appendix), which evaluated 38 alternatives including numerous route alternatives, potential new generation and renewable energy options, and other "non-wires" alternatives to transmission lines.
 - A comprehensive public and agency scoping period was held, including 4 public meetings and 10 meetings with affected public agencies to discuss specific concerns and recommendations. A detailed Scoping Report was prepared and made available on the project website.
 - The Public Involvement Program for the project included development and maintenance of a nearly 10,000 person mailing list, a project website that was updated at each phase of the project, two informal workshops

to inform the public about the Draft EIR and its contents/conclusions, and a total of 6 formal Public Participation Hearings on the Draft and Final EIR.

- After release of the Final EIR, Ms. Lee provided support to the CPUC and the Administrative Law Judge and the Assigned Commissioner during preparation of the Draft Decision and to provide additional alternatives analysis.
- **U.S. Department of Agriculture Forest Service, Region 5 On-Call Environmental Services.** Ms. Lee is the Program Manager for Aspen's three-year contract with the Forest Service to provide NEPA compliance and environmental services to National Forests throughout California. The contract began in early 2004. Projects awarded to date have included biological/cultural surveys and NEPA documentation for fuels management programs at the Angeles National Forest (San Bernardino and Los Angeles Counties), and soil surveys in the Mendocino National Forest.
- **PG&E Los Banos-Gates 500 kV Transmission Project.** Ms. Lee managed preparation of a Supplemental EIR for the California Public Utilities Commission (CPUC) to evaluate potential impacts of an 84-mile transmission line in the San Joaquin Valley. This line is considered critical to enhancing electric reliability in the State, and will relieve transmission congestion between southern and northern California. Aspen's team included 8 subcontractors. The Draft SEIR was released in October 2001 and the Final SEIR was published in February 2002. The project was ultimately not approved by the CPUC because it was constructed under approval by the Western Area Power Administration.
- **PG&E Northeast San Jose Transmission Reinforcement Project:** Ms. Lee served as the Project Manager for this CPUC contract to evaluate PG&E's proposed transmission improvements in Santa Clara and Alameda Counties. The project included a 7-mile 230kV transmission line, a new substation, and connections to several 115kV distribution lines. A major environmental issue was biological resources (the proposed transmission line route would have passed through the San Francisco Bay National Wildlife Refuge and the habitat of several endangered species) and potential effects on high-tech business parks along the transmission line route (on the heart of "Silicon Valley"). Numerous alternative transmission line routes were identified and evaluated in the Draft EIR, Supplemental Draft EIR, and Final EIR. The Final EIR, including a recommended 3.5 mile underground 230 kV transmission line segment, was certified by the CPUC in April 2001. Ms. Lee also managed the mitigation monitoring program for this contract, which was completed when construction finished in mid-2003.
- **California Energy Commission.** Ms. Lee has supported CEC staff since the fall of 2000. To date, she has prepared analyses for 12 power plants throughout the State, and she has also contributed to several special project reports. She has participated in numerous public workshops and hearings around the state, and completed the CEC's Expert Witness Training. Her major efforts for the CEC include the following:
 - Ms. Lee prepared a detailed Background Report and made a presentation at an Energy Commission workshop on "Comparative Alternatives to Transmission" as part of the Integrated Energy Policy Report (IEPR) 2004 Update process. This project evaluated non-wires alternatives to transmission lines; ongoing work is related to development of a methodology for consideration of these alternatives as part of the transmission planning process.
 - Ms. Lee has prepared Alternatives Analyses (consistent with CEQA and the CEC's procedures) for the CEC's staff reports considering proposed new or repowered power plants at Blythe (BEPII), Morro Bay, El Segundo, Avenal, San Joaquin Valley, Potrero (San Francisco), Tracy, East Altamont, and Hercules. She is currently preparing a comprehensive alternatives analysis for the San Francisco Electric Reliability Project.

- Ms. Lee has managed preparation of **Power Plant Cooling Options Reports** for the Potrero Unit 7 Project, Morro Bay, SMUD Cosumnes, and El Segundo power plants. These analyses include conceptual design of dry cooling systems, hybrid cooling systems, and water supply options including use of reclaimed water in both once through and hybrid cooling systems.
- Ms. Lee has provided management and technical support to Aspen's preparation of several reports for the CEC: the Environmental Performance Report, the Coastal Power Plant Study, and the Alternative Generation Technology study.
- Ms. Lee served as the CEC's **Project Manager** for the Small Power Plant Exemption (SPPE) environmental review process for the Woodland Generation Station 2, an 80-megawatt power plant proposed by the Modesto Irrigation District. In this role, she managed preparation of a Draft and Final Initial Study (including mitigation measures, or "conditions of exemption"), held workshops to hear Applicant and public comments, coordinated extensively with CEC staff counsel, and represented the CEC at the Evidentiary Hearing for the project which was approved by the CEC in 2002 and was constructed during 2003.
- **PG&E Region On-Call Environmental Services Contract.** Ms. Lee served as Aspen's Program Manager for this multi-year contract with the CPUC (1999 - 2005) to provide CEQA analysis and mitigation monitoring services for projects in northern California. In addition to the Tri-Valley Project (described separately), projects completed or underway under this contract include:
 - PG&E Substations Mitigation Monitoring (Santa Clara County Norech Substation and others) and development of general monitoring procedures.
 - Preparation of an Initial Study and Mitigated Negative Declaration (MND) for the Atlantic-Del Mar (70 kV) Reinforcement Project. The project was approved by the CPUC in 2002 and construction is expected to begin in late 2004, with Aspen monitors ensuring compliance with all adopted mitigation measures.
 - For the Paradise Power Line (115 kV) Project, Aspen prepared a MND and performed mitigation monitoring during construction, which is now complete.
 - Aspen performed mitigation monitoring for PG&E's installation of portions of natural gas pipeline Line 401 in Shasta and Modoc Counties, under an EIS/EIR completed by the CPUC in the early 1990's.
- **PG&E Tri-Valley 2002 Capacity Increase Project.** Ms. Lee managed preparation of the Draft and Final EIRs for this controversial and complex project during 2000 and 2001, which was certified by the CPUC in May 2001. The Draft EIR (over 800 pages) evaluated proposed transmission lines and substations in the Tri-Valley area (Cities of Pleasanton, Dublin, Livermore, and San Ramon) of Alameda and Contra Costa Counties, and responded to a high level of local concern regarding electric and magnetic fields (EMFs). The EIR presented a range of route and electrical system alternatives for the transmission line segments proposed by PG&E. Ms. Lee developed the project description and managed the alternatives screening and analysis process, and also supervised a team of 11 subcontractors. The Final EIR was certified in November 2001 and construction began in mid-2002. Ms. Lee is also managing the mitigation monitoring phase of the project; the first two phases of a three-phase construction process were completed in November 2003. Phase 3 construction, also to be managed by Aspen, will begin in late 2004 and continue for about 18 months.
- **On-Call Environmental Services Contract for 50-200kV Transmission Lines and Substations (SCE Region).** Under this three-year contract (starting in 1999), Ms. Lee provided CEQA support to CPUC staff for the Lucerne Valley to Big Bear Transmission Line EIS/EIR (San Bernardino County). Her responsibilities included technical review of the Administrative Draft EIS/EIR, detailed review and re-writes of mitigation measures, evaluation of alternatives to determine the CEQA Environmentally Superior Alternative, and attendance at numerous meetings with the CPUC, U.S. Forest Service, and the Edison EIS/EIR contractor.
- **Deputy Program Manager and Delivery Order Manager, U.S. Army Corps of Engineers General Environmental Services Contracts.** For Aspen's on-call environmental services contracts with the

Los Angeles District, Army Corps of Engineers, Ms. Lee has managed several projects requiring NEPA compliance in southern California and Arizona. She has managed preparation of Environmental Assessments for federal agencies, local flood control and recreation districts and military facilities. Projects have included a mitigation measure implementation plan for the U.S. Army's Fort Irwin National Training Center and a variety of environmental assessments related to flood control projects and biological resources in southern California. Other examples of projects she managed are:

- **Lower Colorado River Capacity and Boundary Preservation Project:** Ms. Lee is managing preparation of an Environmental Impact Statement (EIS) for this project. The project is intended to increase the floodflow capacity of the Colorado River and to permanently define the international border between the U.S. and Mexico, in compliance with international agreements and treaties. Several alternatives are being evaluated, including various locations and designs for a pilot channel. The major issues for the project relate to potential project effects on endangered birds in the riparian habitat in the river channel and potential conflicts with Cocopah Indian Tribe land. The project has required extensive and ongoing coordination with a large number of agencies (U.S. Fish & Wildlife Service, U.S. Bureau of Reclamation, U.S. International Boundary and Water Commission, Arizona Department of Game and Fish, Bureau of Indian Affairs). A baseline environmental report was prepared by Aspen in 1999 and is being updated in key issue areas. A series of Stakeholder Meetings were held at Yuma, at which Ms. Lee presented updates on the EIS process.
- **Imperial Beach Shoreline Protection EIS/EIR:** Ms. Lee managed preparation of the environmental baseline section of this EIS/EIR, including marine biological analysis of sensitive kelp beds and sand sources for beach replenishment.
- **Lower Santa Ana River Operations and Maintenance Environmental Assessment:** Ms. Lee managed preparation of this project that evaluated the impacts of a range of river maintenance plans, including dredging in the lower reach, clearing of trees and shrubs, and regular sediment removal from hard bottom areas.
- **Project Mitigation Plan for Land Acquisition EIS, U.S. Army Fort Irwin National Training Center (San Bernardino County):** Ms. Lee managed preparation of this plan that defined how each mitigation measure would be implemented and how its implementation would be ensured.
- **Kinder Morgan Concord-Sacramento Pipeline:** Ms. Lee managed preparation of an EIR for the California State Lands Commission evaluating a proposed 70-mile petroleum products pipeline through Contra Costa, Solano, and Yolo Counties. Major issues related to pipeline safety and the protection of Sacramento/San Joaquin Delta waterways and surrounding biological resources. Ms. Lee managed Aspen's in-house technical and management staff, as well as 7 subcontractor firms. The Final EIR was published in September 2003 and certified by the CSLC in November 2003.
- **Telecommunications On-Call Contract:** Ms. Lee is the Program Manager for an on-call contract awarded to Aspen in 2002 by the CPUC to evaluate telecommunications projects throughout California and to provide mitigation monitoring services. Projects under this contract to date include the following:
 - **Looking Glass Networks:** This proposed network involves construction in the San Francisco Bay Area and the Los Angeles Basin to allow fiber optic connections in numerous locations. Aspen prepared an Initial Study/Mitigated Negative Declaration (IS/MND) in November 2002 and distributed both paper and CD-ROM copies to appropriate jurisdictions for review and comment. Construction of small segments began in 2003, with Aspen serving as mitigation monitoring contractor for the CPUC.
 - **Williams Communications Sentry Marysville Project:** This small project would allow the Applicant to provide fiber optic connection to an air force base in Yuba County. Aspen prepared an IS/MND in December 2002 for publication in January 2003, and monitored construction which was completed in mid-2003.
 - **Metromedia Fiber Network Services:** This project involves monitoring services only, pursuant to a MND completed earlier by the CPUC.

- **PG&E Hydrodivestiture Project.** The 11-volume Draft EIR prepared for the CPUC to consider PG&E's proposed divestiture of its hydroelectric assets was prepared in Aspen's San Francisco office. Ms. Lee assisted in project and contract management, technical review, and document production.
- **Pacific Pipeline Project EIS/Subsequent EIR.** This 2,500-page document (completed in 1996) evaluated a proposed crude oil pipeline from Kern County to refineries in Los Angeles and El Segundo. Ms. Lee performed the duties of Deputy Project Manager and Issue Area Coordinator for Earth Sciences and Cultural Resources, including coordination with Pacific Pipeline System, Inc. (PPSI, the project proponent), assistance in managing of a team of technical subcontractors, and document preparation and production coordination. She participated in alternatives screening analyses, alternatives comparison, and ensured that the document was consistent with applicable requirements of CEQA and NEPA. She also served as the Issue Area Coordinator for Geology, Soils, Hydrology, and Environmental Contamination issue areas and represented the Lead Agencies in public workshops.
- **Pacific Pipeline Mitigation Monitoring, Compliance, and Reporting Program.** Ms. Lee served as Deputy Program Manager for the pre-construction phase of this monitoring and compliance project for construction of a 132-mile crude oil pipeline in southern California, under contract to the California Public Utilities Commission and the Angeles National Forest. Her primary responsibilities included management of technical plan review for the approximately 100 plans and reports required prior to construction; management of subcontractors providing technical expertise, and coordination with lead agencies and pipeline owner/contractors.
- **Alturas Transmission Line EIR/S.** For this project evaluating a 345 kV transmission line in northeastern California and Nevada, Ms. Lee served as Issue Area Coordinator, providing management support and technical oversight of geology and hydrology issue areas. She also drafted project description, provided technical review, and managed subcontractor labor for this 165 mile proposed linear project. She managed preparation of master Mitigation Monitoring Program and the Impact Summary Tables for the Final EIR.
- **Kinder Morgan Carson-Norwalk Pipeline EIR and Mitigation Monitoring, Compliance, Reporting, and Program (MMCRP).** As Project Manager, Ms. Lee managed the CEQA evaluation of a proposed 13-mile petroleum products pipeline in urban Los Angeles for the CPUC. The project included review of Kinder Morgan's Proponent's Environmental Assessment (PEA), preparation of an Initial Study, and a Draft and Final EIR. The Final EIR was completed in May 1998 (certified in October 1998). Public participation activities included Scoping Meetings, an Informational Workshop, a Public Participation Hearing, a project newsletter, and creation of an Internet website. Alternatives to five portions of the proposed pipeline route were identified. Sensitive issues included pipeline safety, potential impacts on water wells and surface waters, and construction impacts such as noise and air quality degradation. Ms. Lee also managed the MMCRP for the construction of the Carson-Norwalk Pipeline.
- **Yellowstone Pipeline Reroute EIS.** Aspen prepared an EIS for the USDA Forest Service, Lolo National Forest, for a controversial petroleum products pipeline in western Montana. Ms. Lee served as Issue Area Coordinator for three issue areas: Hydrology and Water Resources; Geology, Mineral Resources, and Paleontology; and Soils. Her responsibilities included coordination of management issues with project scientists and agency personnel, review of technical reports, oversight of fieldwork, and writing of EIS text from technical reports prepared by issue area specialists.

Previous Employment

1977 to 1993

Ms. Lee worked for seven years with the U.S. Minerals Management Service (MMS), Pacific OCS Region. As a geologist and team leader in the MMS Field Operations office from 1979 to 1987 (during the Region's most active period of oil and gas exploration and development), she reviewed numerous

offshore oil and gas exploration and development plans. Her responsibilities at MMS also included regulatory enforcement and facility inspection, coordination of environmental and technical review of development proposals, and participation in the EIS and Coastal Commission Consistency Review processes with inter-agency Joint Review Panels. Ms. Lee maintains an excellent working relationship with MMS's Pacific OCS Region staff

- At MMS, Ms. Lee specialized in regulatory enforcement and review of offshore oil and gas platforms, especially application of regulations regarding air quality and oil and gas production, and supervised other geologists and engineers.
- During three years (1977 to 1979) with the U.S. Geological Survey (USGS) in Reston, Virginia, in the Earth Sciences Applications Program, Ms. Lee participated in development of geologic hazards information in formats accessible to land use planners and non-scientific personnel.

From 1987 through 1992, Ms. Lee worked as an independent consultant and corporate Marketing Director. In these positions she developed and managed the marketing program for Pasadena's leading real estate brokerage, and she also created and promoted her own successful real estate firm.

SELECTED TECHNICAL REPORTS

Analysis of Competitive Bidding in Offshore California Lease Sales (Masters Report, Stanford University, 1984)

Article on Subsidence and Land Use Planning Issues, in U.S. Geological Professional Paper entitled "Nature to be Commanded ..."

Landslide Risk in the United States, U.S. Geological Survey Map MF-771 (contributing researcher).

CERTIFICATES/AWARDS

- Association of Environmental Professionals – First Place Award for Outstanding Environmental Analysis Document (2004) Jefferson-Martin 230 kV Transmission Line EIR
- California Energy Commission's Outstanding Performance Award for 2001

TRAINING

California Energy Commission Expert Witness Training

DECLARATION OF MARK LINDLEY

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

1. I am presently employed as a consultant by the California Energy Commission in the Facilities Siting Office of the Systems Assessments and Facilities Siting Division.
2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.
3. I helped prepare the staff testimony on **Soil and Water Resources** for the San Francisco Energy Reliability 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. Feb 14, 2006 Signed. 

At: San Francisco, California

Mark Lindley, P.E.

Associate

Mr. Lindley is a water resources engineer with experience in creek and wetland restoration design, construction management, environmental impact/CEQA review, hydraulic design, surface and groundwater hydrology, field data collection, water quality, and remediation. Mr. Lindley combines his expertise in technical analyses and engineering design with his project management responsibilities to effectively address client needs. His technical work has included analysis and engineering design guidance in creek and wetland restoration projects, as well as hydraulic design guidance for flood control projects and environmental impact analysis for CEQA projects. Mr. Lindley has provided construction management services for creek restoration projects including the implementation of grade control structures, toe protection, and biotechnical stream bank stabilization methods. He has also managed construction of wetland restoration projects including slough channel excavation, levee breaching and lowering, levee and wind wave berm construction, installation of culverts and hydraulic structures, and re-vegetation. Additionally, Mr. Lindley has managed work efforts to collect data for physical characterization of project sites that include small and full-scale field studies for marsh and estuarine monitoring, stream monitoring, topographic and hydrographic surveying, and groundwater monitoring. Mr. Lindley also has significant experience in the design, construction and operation of soil and groundwater remediation and treatment systems.

Education	M.S., 1994	Biosystems & Agricultural Engineering, Oklahoma State University, Stillwater, OK
	B.S., 1989	Mechanical Engineering University of Kentucky, Lexington, KY

Professional Registration 2004 Civil Engineer, California (License No. C 66701)

Awards Phoenix Award for Outstanding Master's Student—First Runner-Up

Professional Societies American Society of Agricultural Engineers

Selected Project Experience **Blythe Energy Project - Phase II, Environmental Impact Review.** Blythe, CA Provided environmental review of a proposed power plant in Blythe for the California Energy Commission. The environmental review was focused on the impacts of the proposed use of groundwater on the neighboring Colorado River. Other analyses included assessing potential flooding, erosion, and water quality impacts related to the plant's evaporation pond, retention basin, and storm water drainage channels.

San Francisco Electric Reliability Project, Environmental Impact Review. San Francisco, CA. Provided environmental review of a proposed power plant in San Francisco for the California Energy Commission. The environmental review was focused on the utilization of recycled wastewater from the City of San Francisco's combined sewer system and treated onsite for power plant evaporative cooling. In addition, the project site is located in a historic industrial area with existing subsurface impacts from previous land uses that required specific assessment and management to limit risks to onsite workers and neighboring businesses and residences. Other analyses included assessing potential flooding, erosion, and water quality impacts related to the plant's construction and operation.

Windemere Development, Surface Runoff Management. Contra Costa County, CA Conducted analysis and design of water quality treatment and flood control detention facilities for the Windemere Development. Developed a sediment management and monitoring plan for a wetland detention basin, collecting runoff from the Windemere Development.

**Selected
Project
Experience
(continued)**

Soil and Water Resource Compliance Reviews, Storm Water Pollution Prevention Plan review and implementation. Provided technical review of construction and operation Storm Water Pollution Prevention Plans (SWPPPs) for several power plants located throughout the state for the California Energy Commission (CEC). Review of SWPPPs to determine if they met the requirements of Conditions of Certification specified in the CEC's licensing decision and included sufficient detail and specified appropriate Best Management Practices (BMPs) to address potential erosion and water quality impacts.

CEC Soil and Water Resource Workshop, Storm Water Pollution Prevention Plans. Presented a classroom workshop for CEC staff on Storm Water Pollution Prevention Plans. Workshop included basic rainfall-runoff estimation techniques, open channel flow computations, and soil erosion estimates. Also presented was a review of Best Management Practices used at construction sites and operational power plants including sizing and installation approaches. Site visits to several power plant sites involved inspection of BMPs to review installation of measures included in the SWPPP in preparation for the rainy season.

Alamo Creek Restoration Project, Construction Management. Contra Costa County, CA. Provided construction management and observation services for the Alamo Creek Restoration Project which entailed re-creation of a multi-stage channel for 6,000 feet of the deeply incised main branch and channel relocation of 3,000 feet of the east branch. The restoration plan included grading, grade control, bank restoration and vegetative treatments.

Petaluma Marsh Restoration Project, Construction Management. Marin County, CA. Provided construction management and observation services for the Project, which entailed re-creation of a 102-acre tidal marsh on diked and subsided farmland. The restoration plan included excavation of tidal slough channels, breaching and lowering the existing perimeter levee, creation of wind-wave berms, construction of a significant new levee to protect and adjacent railroad easement, and revegetation.

Lincoln Creek Restoration, Creek Restoration Design. Auburn, CA. Developed Creek Restoration design plans for day-lighting a 500 ft reach of Lincoln Creek within the Auburn School Park Preserve for the City of Auburn. Conducted hydraulic analyses and engineering design for the project to determine design sections and rock sizes that met the client's aesthetic requirements for the park and engineering design/stability requirements. Developed design drawings from conceptual level through 100% construction plans.

Los Capitancillos Wetland Mitigation Project, Wetland Design. San Jose, CA. Conducted hydrologic and hydraulic analysis and design of freshwater mitigation wetland facility for Santa Clara Valley Water District. Provided preliminary design of grading, clean soil liner, as well as, inlet and outlet channels and structures. Analyses included water usage, percolation and seepage, rainfall-runoff, and flood routing.

Hamilton Seasonal Wetland Design Guidelines, Wetland Design. Novato, CA. Developed design guidelines for seasonal wetland at the Hamilton Airfield. Provided water balance and percolation analyses related of placement of dredged materials at pilot seasonal wetland sites.

Sonoma Baylands Wetlands Demonstration Project, Post-Construction Marsh Restoration Monitoring. Sonoma County, CA. Managed a team of surveyors and vegetation, avian, and fish scientists in the monitoring of a marsh restoration project for the USACE. The Project utilized dredge materials to raise the elevation of subsided farmland by several feet to approximately mean tide level to accelerate the establishment of wetland vegetation. Post-Construction Monitoring is focused on slough channel development, tidal elevation monitoring, sedimentation, bird and fish use, and vegetation establishment.

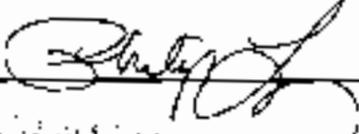
DECLARATION OF Philip Luecking

I, **Philip Luecking** declare as follows:

1. I am presently employed as a consultant by the California Energy Commission in the Facilities Siting Office of the Systems Assessments and Facilities Siting Division.
2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.
3. I helped prepare the staff testimony on **Soil and Water Resources**, for the San Francisco Energy Reliability 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: 02-17-06

Signed: 

At: San Francisco, California

Philip L. Luecking

Associate

Mr. Luecking is a licensed professional civil engineer, specializing in water resources and engineering design. Mr. Luecking is actively involved in translating preliminary design concepts into final designs and the preparation of construction documents. He is experienced in using AutoCAD to develop three-dimensional grading plans used in construction and cost estimation, and has also developed feasibility level designs for water delivery and irrigation systems and performed reservoir operations modeling. Mr. Luecking has field experience in environmental remediation and analytical soil and water sampling as well as construction assessment and oversight.

Education	M.S., 2000	Civil & Environmental Engineering University of California, Berkeley
	B.S., 1998	Civil Engineering University of Illinois at Urbana-Champaign

Professional Registration Professional CA Civil Engineer - License No. 66113

Selected Project Experience **California Energy Commission Compliance Review, CA** - Review of compliance submittals, primarily construction and Industrial Storm Water Pollution Prevention Plans (SWPPP) for nine Energy Commission Projects. Provided support for the development of a Preliminary Staff Assessment and Data Requests related to Soil and Water Resources.

12th Street Reconstruction, Oakland, CA - Provided hydraulic and geomorphic analyses of Lake Merritt and the channel within the project limits, tidal marsh restoration design as well as design input and support for elements of the new shoreline park, planting plans, and innovative stormwater system. Mr. Luecking developed grading plans and shoreline treatment designs for the preliminary design of a tidal marsh.

Hamilton Air Force Base Seasonal Wetlands, Marin County, CA - Developed designs for two sites (200 acres total) that include assessment of tidal flooding frequency, water and salt balance, seasonal surface hydrology and connection to adjacent tidal wetland complex at the former air force base. Mr. Luecking developed a water and salt balance modeling tool used in support of the preliminary design.

Napa Sonoma Marsh Restoration, Napa, CA - Engineering design services for the conversion of over 4,000 acres of former salt ponds to tidal marsh along the Napa River. This project is the first phase of habitat restoration for the 10,000-acre Napa Salt Ponds Complex. Mr. Luecking assisted in the completion of the final design and design documents.

**Selected
Project
Experience
(continued)****Water Resource Engineering Experience (experience prior to PWA)**

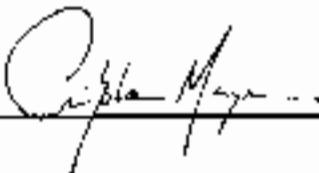
- Developed reservoir operations models to determine safe yield of a multi-use reservoir
- Conducted hydraulic modeling of small river systems and sediment transport analyses
- Designed a 100 cfs diversion structure with self-cleaning fish screens and assisted in the development of construction plans and specifications
- Conducted municipal and irrigation water supply analyses
- Designed canals, pipelines, diversion dams, pump stations, treatment wetlands, and storage reservoirs for feasibility level design projects
- Estimated costs for a multitude of water delivery and construction projects
- Performed technical reviews of San Francisco Water Department operations on behalf of suburban water users
- Completed technical reviews of water system master plans, general plans, and associated analyses to determine nexus with capital improvement and connection fee programs

DECLARATION OF

I, **Christopher Meyer** declare as follows:

1. I am presently employed by the California Energy Commission in the Facilities Siting Office of the Systems Assessments and Facilities Siting Division as a **Compliance Project Manager**.
2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.
3. I helped prepare the staff testimony on **Compliance** for the San Francisco Energy Reliability 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: 2 FEB 2006 Signed: 

At: Sacramento, California

CHRISTOPHER J. MEYER
Archaeologist/Lead Compliance Manager

ACADEMIC BACKGROUND
B.A., Biological Anthropology
California State University, Hayward, 1993

PROFESSIONAL EXPERIENCE

Mr. Meyer's background combines strong experience in environmental inspection and compliance management on large-scale construction projects with a solid background in archaeological field investigations. He has worked closely with construction contractors, agency representatives, and Native American tribal governments to ensure projects are built on time, within budget, and in compliance with all environmental requirements. In addition to field experience, he has produced reports, document, and permit applications, and has reviewed mitigation measures for federal, State, and local government agencies as well as corporations.

Aspen Environmental Group

1999 to present

Compliance Project Manager, Siting and Construction of Power Plants. Under contract to the California Energy Commission (CEC), Mr. Meyer serves as a Compliance Project Manager and supervises technical staff members, preparing the CEC's Conditions of Certification for construction of power plants across the State as well as managing on-going operational issues with power plants currently under license with the CEC. Responsibilities included: preparation of amendments to conditions of certification for existing power plants; review of applications for new power plants; drafting of Memoranda of Understanding with Chief Building Officials; coordinating with affected agencies to resolve concerns with potential impacts to cultural resources or threatened or endangered species, maintaining contractor construction milestones, detailed reporting, development of mitigation measures; conflict resolution; and inspection for compliance with the Conditions of Certification.

Lead Environmental Monitor, SDG&E Miguel-Mission 230 kV #2 Project Construction Monitoring and Supplemental Environmental Review Program. Under contract to the California Public Utilities Commission (CPUC), Mr. Meyer serves as Lead Environmental Monitor and supervises one environmental monitor in the field, monitoring the implementation of the CPUC environmental impact report's conditions of approval for construction of the overhead 230 kV electric transmission line and substations upgrades. The project includes installing a new 230 kV circuit on existing towers along the 35-mile right-of-way, as well as relocating 69 kV and 138 kV circuits on approximately 80 steel pole structures. In addition, the Miguel Substation and Mission Substation would be modified to accommodate the new 230 kV transmission circuit. Responsibilities include: supervision, guidance and development of environmental monitors in field monitoring as well as the compliance review of pre-construction plans and mitigation compliance documentation, review of variance requests and temporary extra work space (TEWS) requests; recommendations for CPUC issuance of Notices to Proceed with construction and variance approvals; approval of TEWS requests; and coordination with SDG&E, construction managers and subcontractors, and landowners, local municipalities, affected and interested agencies and the public.

Lead Environmental Monitor, SCE Viejo Systems Project Construction Monitoring and Supplemental Environmental Review Program. Under contract to the California Public Utilities Commission (CPUC), Mr. Meyer served as Lead Environmental Monitor and supervises one environmental monitor in

the field, monitoring the implementation of the CPUC negative declaration's conditions of approval for construction of the overhead 66 kV and 220 kV electric transmission lines and substation upgrades and construction. This Southern California Edison (SCE) project involves the installation of a 220/66/12 kV substation and 3.1-mile 66 kV transmission line in southern Orange County, California. The transmission line will traverse residential and recreational areas in the City of Mission Viejo and the substation is located in a business park adjacent to a wilderness area in the City of Lake Forest. Responsibilities include: supervision, guidance and development of environmental monitors in field monitoring as well as the compliance review of pre-construction plans and mitigation compliance documentation, review of variance requests and temporary extra work space (TEWS) requests; recommendations for CPUC issuance of Notices to Proceed with construction and variance approvals; approval of TEWS requests; and coordination with SDG&E, construction managers and subcontractors, and landowners, local municipalities, affected and interested agencies and the public.

Lead Environmental Monitor, U.S. Army Corps of Engineers Prado Dam and Reach 9 Project Construction Monitoring Program. Under contract to the U.S. Army Corps of Engineers (Corps), Mr. Meyer serves as Lead Environmental Monitor and supervises one environmental monitor in the field, monitoring the implementation of the Corps environmental regulations during expansion of the Prado Dam and associated downstream modifications. Responsibilities include: supervision, guidance and development of environmental monitoring in the field as well as the compliance review of pre-construction plans, such as the Storm Water Pollution Prevention Plan, and mitigation compliance documentation, variance requests; recommendations for Corps issuance of Notices to Proceed with construction and variance approvals; and coordination with construction managers and subcontractors, and landowners, local municipalities, affected and interested agencies and the public.

Lead Environmental Monitor, PG&E Tri-Valley 2002 Capacity Increase Project Construction Monitoring and Supplemental Environmental Review Program. Under contract to the California Public Utilities Commission (CPUC), Mr. Meyer serves as Lead Environmental Monitor and supervises two environmental monitors in the field, monitoring the implementation of the CPUC environmental impact report's conditions of approval for construction of this combination overhead and underground 230 kV electric transmission lines and substations. Construction involves underground installation of the double-circuit 230 kV transmission line conduit and construction of a substation and several transition stations as three separate phases. Responsibilities include: supervision, guidance and development of environmental monitors in field monitoring as well as the compliance review of pre-construction plans and mitigation compliance documentation, variance requests and temporary extra work space (TEWS) requests; recommendations for CPUC issuance of Notices to Proceed with construction and variance approvals; approval of TEWS requests; and coordination with PG&E, construction managers and subcontractors, and landowners, local municipalities, affected and interested agencies and the public.

Lead Environmental Monitor, PG&E Atlantic Del Mar Project. Under Aspen's environmental services contract with CPUC, Mr. Meyer serves as Lead Environmental Monitor and supervises one environmental monitor in the field for the mitigation monitoring, compliance, and reporting program for PG&E's Atlantic Del Mar Project in the Cities of Rocklin and Roseville. This approximate four-mile transmission line involves both underground and overhead construction. The project right-of-way will traverse potential habitats for listed vernal species and areas containing historic resources. The project is currently in the construction phase which is expected to be completed by January 2006.

Project Manager, Monitoring, PG&E Jefferson-Martin 230 kV Transmission Line Project. Under contract to CPUC, Mr. Meyer serves as Lead Environmental Monitor and supervises two environmental monitors in the field, monitoring the implementation of the CPUC compliance and reporting program for the PG&E Jefferson-Martin Project. This project involves the installation of a 27-mile 230 kV transmission line through scenic San Mateo County in the Highway 286 corridor, urban Colma and Daly City, and across San Bruno Mountain. Responsibilities include: supervision, guidance and development of

environmental monitors to field monitoring as well as the compliance review of pre-construction plans and mitigation compliance documentation, variance requests and temporary extra work space (TEWS) requests; recommendations for CPOC issuance of Notices to Proceed with construction and variance approvals; approval of TEWS requests; and coordination with PG&E, construction managers and subcontractors, and landowners, local municipalities, affected and interested agencies and the public.

Lead Environmental Monitor, U.S. Army Corps of Engineers Murrieta Creek Flood Control, Environmental Restoration, and Recreation Project Construction Monitoring Program. Under contract to the U.S. Army Corps of Engineers (Corps), Mr. Meyer served as Lead Environmental Monitor in the field, monitoring the implementation of the Corps environmental regulations during Phase I of the project. Responsibilities included: pre-construction special status species surveys, protection of sensitive species habitat, guidance and development of environmental monitoring in the field as well as the compliance review of pre-construction plans, such as the Storm Water Pollution Prevention Plan, and mitigation compliance documentation, variance requests; and coordination with construction managers and subcontractors, and landowners, local municipalities, affected and interested agencies and the public.

Cultural Resources Lead, Ventura County Watershed Protection Division Los Padres National Forest Rain Gage Survey. Under contract to Ventura County, Mr. Meyer served as the Lead Archaeologist on literature search and field surveys for Ventura County's application for a renewal of their Forest Service Use Permit. Mr. Meyer conducted literature searches in both the Forest Service's archaeological records and at the California State University Fullerton Information Center. In addition, he conducted pedestrian surveys at the various rain gage locations and provided written reports on the findings.

Lead Environmental Monitor, Department of Water Resources Santa Ana Pipeline Project Construction Monitoring Program. Under contract to the Department of Water Resources (DWR), Mr. Meyer served as Lead Environmental Monitor in the field, monitoring the implementation of the DWR environmental regulations during repairs of sections of the 40-foot in diameter pipeline in San Bernardino and Riverside Counties. Responsibilities included: guidance and development of environmental monitoring in the field as well as the compliance review of pre-construction plans, such as the Storm Water Pollution Prevention Plan, and mitigation compliance documentation, and coordination with construction managers and subcontractors, and landowners, local municipalities, affected and interested agencies and the public.

Compliance Project Manager, Emergency Siting and Construction of Peaker Power Plants. Under contract to the California Energy Commission (CEC), Mr. Meyer served as a Compliance Project Manager and supervised technical staff members, preparing the CEC's Conditions of Certification for construction of emergency power plants across the State. Responsibilities included: review of applications for new emergency power plants; drafting of Memoranda of Understanding with Chief Building Officials; coordinating with affected agencies to resolve concerns with potential impacts to cultural resources or threatened or endangered species; maintaining contractor construction milestones, detailed reporting; development of mitigation measures; conflict resolution; and inspection for compliance with the Conditions of Certification.

Archaeologist, California Energy Commission Coastal Plant Study. This research study undertaken by the California Energy Commission (CEC) examined the engineering and environmental issues associated with 24 coastal power plants. The purpose of the study was to identify, describe, and analyze issues with the potential to substantially delay or complicate the certification process for future applications to the Energy Commission for expansion or modernization of existing coastal power plants. For this study, Mr. Meyer was responsible for performing site surveys and reviewing documentation for cultural resources for all 24 Coastal Power Plants.

Lead Environmental Monitor, PG&E Northeast San Jose Transmission Reinforcement Project Construction Monitoring and Supplemental Environmental Review Program. Under contract to the California Public Utilities Commission (CPUC), Mr. Meyer served as Lead Environmental Monitor and supervised two environmental monitors in the field, monitoring the implementation of the CPUC environmental impact report's conditions of approval for construction of this combination overhead and underground 230 kV electric transmission lines and substations in the Cities of San Jose, Milpitas, and Fremont. Construction of the dual 230kV circuit involved underground construction, single pole tower installation, and construction of the Los Esteros Substation. Given the proximity of the project to the Bay, sensitive biological resources were present, including the burrowing owl and wetland mitigation sites. Responsibilities included: supervision, guidance and development of environmental monitors in field monitoring as well as the compliance review of pre-construction plans and mitigation compliance documentation, variance requests and temporary extra work space (TEWS) requests; recommendations for CPUC issuance of Notices to Proceed with construction and variance approvals; approval of TEWS requests, and coordination with PG&E, construction managers and subcontractors, and landowners, local municipalities, affected and interested agencies and the public.

Lead Environmental Monitor, Level 3 Fiber Optics Network Construction Monitoring and Supplemental Environmental Review Program. Under contract to the California Public Utilities Commission (CPUC), Mr. Meyer served as Lead Environmental Monitor and supervised up to five environmental monitors in the field, monitoring the implementation of the CPUC's broad conditions of approval for construction of this 2,000-mile fiber optics network across the State. Responsibilities included: supervision, guidance and development of environmental monitors in field monitoring as well as the compliance review of pre-construction plans and mitigation compliance documentation, variance requests and temporary extra work space (TEWS) requests; recommendations for CPUC issuance of Notices to Proceed with construction and variance approvals; approval of TEWS requests; preparation of weekly reports for all monitoring activity; and extensive coordination with Level 3, construction managers and subcontractors, railroad managers and other landowners, local municipalities, affected and interested agencies and the public.

Environmental Monitor, Kinder Morgan/SEPP Carson-Norwalk Pipeline MMCRP. Monitored the pipeline company's inspection team for compliance with CPUC conditions of approval during construction of 13 miles of petroleum products pipeline and four stations. Monitored for hazardous materials management, storm water pollution prevention, and biological and cultural resources. Maintained daily written documentation of compliance activities.

GPS Field Technician, Spine Flower Survey, U.S. Army Corps of Engineers. Mr. Meyer participated in a survey for the slender-stemmed spine flower in the Santa Ana River Wash, below the Seven Oaks Dam in San Bernardino County, to assess species impact from changes in hydrology once the Seven Oaks Dam is operational. The pedestrian survey was conducted over several months and consisted of multiple consecutive transects, covering approximately 5,300 acres. Several populations of spine flower were located and mapped. The survey and mapping required extensive use of GPS equipment for the mapping of transects surveyed and the location of spine flower populations.

Pacific Pipeline Project

1997 to 1998

CPUC Environmental/Archaeological Monitor

Under subcontract to Aspen Environmental Group, monitored the pipeline company's inspection team for compliance with CPUC conditions of approval during construction of 132 miles of oil pipeline in southern California. Coordinated construction activities with the applicant's inspection team, archaeological specialists and Native American monitors through areas with sensitive cultural, biological, and visual resources. Monitored for hazardous materials management, storm water pollution prevention, and biological and cultural resources. Maintained daily written documentation of compliance activities.

TransCanada, Environmental Training Program
Associate

1997

Assisted in the development of an environmental training program for a major natural gas company with 8,700 miles of pipeline and associated energy facilities on three continents. Developed training exercises related to environmental compliance topics, including clearing and grading, trenching and backfilling, cultural resources, and hydrostatic testing. Interactive training strategies included small group exercises, demonstrations, quizzes, and scenarios.

Pacific Gas and Electric Company, Los Esteros Project
Associate

1997

Assisted in the research, development and production of the Proponent's Environmental Assessment (PEA) as part of a California Public Utilities Commission filing for a Permit To Construct. The Los Esteros Project includes construction of a substation and two 115/21 kilovolt power lines. Authored the project description, transportation section, utilities section, and socioeconomics section and coordinated and edited contributions prepared by PG&E and subcontractors.

Sierra Pacific Power Co., Alturas 345 kV Electric Transmission Project
Associate

1996 to 1997

Assisted in the development of the environmental management program implementation plan for a 164-mile electric transmission line. Wrote the Storm Water Pollution Protection Plan (SWPPP) for the California and Nevada segments.

El Paso Energy Corporation, Trans Colorado Phase I
Environmental Inspector

1996

Inspected for environmental compliance on a Federal Energy Regulatory Commission (FERC) regulated 22-mile natural gas pipeline in northern New Mexico and southern Colorado. Inspected for hazardous materials management, erosion control, fire prevention, topsoil handling, stream crossings, and biological and cultural resources. Inspected site-specific installation of temporary and permanent erosion control measures. Coordinated with construction and agency personnel on a daily basis and completed daily field logs and prepared reports as requested. Assisted with the presentation of an eight-hour kickoff environmental training program for agency personnel and construction management. Conducted environmental training classes for construction personnel.

**Central Coast Water Authority, Mission Hills
and Santa Ynez Extensions and Coastal Branch, Phase II**
Environmental Monitor

1995 to 1996

Monitored and inspected for environmental compliance during construction of 145 miles of water pipeline in Santa Barbara and San Luis Obispo Counties. Coordinated construction activities with the construction contractor, Native American monitors, landowners, and construction inspectors through areas with sensitive cultural, biological, and visual resources. Conducted field surveys immediately ahead of construction to identify potential problem areas and confirm proper flagging of sensitive resources. Captured and relocated wildlife from construction areas. Oversaw construction of sensitive stream crossings and conducted water quality testing in compliance with California Department of Fish and Game permit requirements. Inspected site-specific installation of temporary and permanent erosion control measures. Provided field assessment and documentation of a contractor compensation program. Designed to protect oak trees and minimize ground disturbance in sensitive habitats. Maintained daily written documentation of compliance activities. Provided on-site environmental training for construction crews.

Pacific Gas and Electric Company

1995

Regulatory Process and Environmental Review Training

Assisted as an Associate in the development of a Regulatory Process and Environmental Review training session and course handbook. Conducted research on federal, State, and local agency regulatory and permitting requirements for utility construction projects. Provided technical overview for sections on cultural resource management and historic preservation law.

Pacific Gas Transmission Company

1994 to 1995

Coyote Springs and Medford Extensions

Cultural Resources Coordinator

Coordinated development and implementation of the cultural resources management program for construction of 100 miles of natural gas pipeline in Oregon. Worked with federal, State, and local agencies to determine appropriate treatment and mitigation for affected archaeological sites. Assisted in the development of project implementation plans and environmental assessments, including the development and submittal of the project's Historic Properties Treatment Plan. Managed report preparation and field work by the archaeology subcontractor.

Pacific Gas Transmission Company, Medford Extensions

1995

Environmental Inspector

Monitored for compliance with project environmental requirements during construction of 89 miles of natural gas pipeline. Inspected for cultural and paleontological resources, erosion control, safety regulations, sensitive wildlife species, stream and wetland crossings, timber harvesting, dust control, fire protection, hazardous materials management, and post-construction restoration. Worked with local Native American tribal governments and monitors (Klamath and Siletz tribes) to ensure proper monitoring of culturally sensitive areas and treatment of unanticipated cultural discoveries. Responsible for all inspection responsibilities (craft, environmental, and cultural) during a two-month boring operation under a sensitive Native American site.

INFOTEC Research, Inc.

1989

Field Technician

Performed archaeological field work for segments of the PG&E Pipeline Expansion Project in Jefferson County, Oregon. Conducted Phase I surveys and Phase II testing of significant archaeological sites according to federal and State archaeological mitigation guidelines and evaluated eligibility for the National Register of Historic Places.

TRAINING & CERTIFICATIONS

2001 Desert Tortoise Council Surveying, Monitoring and Handling Workshop

2001 Horizontal Directional Drilling Training

1999 Railroad Right-of-Way Safety Training (UPRR, BNSFRR)

1996 International Erosion Control Association Training

1995 Cultural Resources Presenter at EFRC training for Pacific Gas Transmission projects in Oregon

1995 General Services Administration course on Section 106 of Historic Preservation Law

1994 U.S. Navy Maritime Academy Course on Global Positioning System (GPS)

1989 California State University, Northridge on San Clemente Islands

Conducted field work in paleoindian archaeology (Chamash and Gabrielino Indians)

1988 California State University, Hayward

Conducted historic archaeology field work on the Ardenwood Historic Farm

DECLARATION OF

I, Tuan Ngo, declare as follows:

1. I am presently employed by the California Energy Commission in the Environmental Office of the Systems Assessments and Facilities Siting Division as a Mechanical Engineer.
2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.
3. I helped prepare the staff testimony on **Air Quality** for the San Francisco Energy Reliability 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: 2/10/06 Signed: 

At: Sacramento, California

TUAN A. NGO, P.E.
1516 Ninth Street
Sacramento CA 95814
(916) 654-3852

EDUCATION

Graduate from the University of California, Davis, in 1981 with a B.S. degree in Chemical Engineering.

Registered Chemical Engineer with the State of California, #CH-4433.

Course works in Air Pollution Control:

- Effective stack height and plume rise,
- Dispersion modeling,
- Fabric collector plan review,
- Wet scrubber plan review,
- Degreasing operations,
- Control of VOC emissions from leaking process equipment,
- PSD regulation,
- Hazardous waste incineration,
- ESP plan review,
- Boiler operations.

Teaching in Air Pollution Control:

- Degreasing operations,
- Dry cleaning,
- VOC emissions from leaking process,
- Control of VOC emissions.

EXPERIENCES

California Energy Commission – Mechanical Engineer - Siting Division/Air Quality Section – 1992 to present.

Evaluate applications for certification for power plants to identify any possible air quality impacts and assess appropriate mitigation measures. Manage contracts of, and conduct research studies on power plant emissions, and track the developments in new and innovative air pollution control technologies that are related to power plants. Maintain contact with local, state and federal air quality management agencies for update on the air quality issues.

California Air Resources Board – Associate Air Resources Engineer – Industrial Projects Section (1984 to 1992)

Oversight reviewing of District and EPA approved industrial projects to ensure that the issued permits conform with all applicable rules and

regulations, offsets have been properly provided, and that appropriate control equipment have been addressed.

Plan and organize studies to evaluate the effectiveness of local District's New Source Review Programs.

Plan, design, organize and conduct highly technical research studies on feasibility of new control technology.

Coordinate the engineering review of large power plants from the District, ARB, EPA and California Energy Commission staff.

Lead the development of control strategies, suggested control measures, and state regulations to reduce the emissions from industrial processes and consumer products.

Conduct workshops and consultation meetings to solicit information needed for the development of suggested control measures and regulations.

Conduct seminars and teach EPA training courses on air pollution control technologies.

Kern County Air Pollution Control District – Air Sanitation Engineer II – Permit Section (1982 to 1984).

Evaluate application for completeness determination, process application for Authority to Construct and Permit to Operate for industrial processes. Make recommendations for approval or denial of application for permits. Meet with industry representatives to discuss application completeness, suggest alternatives or modifications for them to apply to gain project's approval. Conduct control technology feasibility studies. Conduct site visits, and compliance inspections. Handle public nuisance complaints, and witness source testing as necessary.

DECLARATION OF

Dr. Obad Odoemelam

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

1. I am presently employed by the California Energy Commission in the Facilities Siting Office of the Systems Assessments and Facilities Siting Division a Staff Toxicologist.
2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.
3. I helped prepare the staff testimony on **Transmission Line Safety and Nuisance** for the San Francisco Energy Reliability 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 Jan 26, 2006 Signed: Obad Odoemelam

At: Sacramento, California

RESUME

DR. OBEDI ODOFMELAM

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
William Pfanner, B.S.

I, **William Pfanner, B.S.** declare as follows.

1. I am presently employed by The California Energy Commission in the **Systems Assessment and Facilities Siting Division** as a **Project Manager**.
2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.
3. I prepared the staff testimony on **Project Description, Executive Summary, and the Introduction**, for the San Francisco Energy Reliability 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:

2/10/06

Signed:

William Pfanner

At:

Sacramento

William Pfanner
909 Bienville Street
Davis, CA 95616
(530) 792-1587

OBJECTIVE: Management position developing and facilitating projects that protect and enhance both the natural and man-made environment

HIGHLIGHTS AND QUALIFICATIONS

- Community-oriented planner with 20 years of experience
- Skilled in land planning, environmental law and the development process
- Proven history in city, county and state governments
- Knowledge of federal, state and local agencies and entitlement process
- Successful manager of large staffs and complex projects
- Reputation for leadership, ethics and outstanding communication skills

EXPERIENCE IN THE PRIVATE SECTOR

California Energy Commission – Project Manager for the Siting of Power Plants. (November 2001-present)

Senior Project Manager - Jones & Stokes. Responsible for managing environmental clearance and regulatory compliance for a 300 mile fiber optic cable installation project in northern California. Facilitated coordination with numerous local, state and federal agencies through final project construction. Also prepared CEQA documents for projects, including the expansion of a wastewater treatment facility and the development of a new recreational marina. (August 1999 to October 2001)

Senior Planner - Quad Knopf. Team leader for siting and permitting Sprint PCS' wireless telecommunication system in the Sacramento region. Also responsible for project management of Environmental Impact Reports, supervision and preparation of technical reports, and the preparation of proposals and firm marketing. (October 1998 to August 1999)

Planning Division Supervisor - Matthews Land Company. Responsible for overseeing planning functions in the Seattle metropolitan area, working to identify viable antenna sites and obtain planning approvals for Nextel's telecommunication system. (July 1997 to October 1998)

Project Manager - Kell Telecommunication Services. Project leader for permitting Sprint PCS' wireless telecommunication system in Sacramento and the Bay Area. Responsible for siting facilities and obtaining planning approvals from city and county jurisdictions, and facilitating the development of collocation sites with other wireless carriers. (January 1996 to June 1997)

Development Consultant - William Pfanner & Associates. Private planning and development consultant. Prepared feasibility studies; assisted in siting design and permitting of a mixed-use residential subdivision, a residential resort facility, and a performing arts and convention center. (January 1987 to December 1995)

Contract Planner - EBA Wastechologies, Inc. Project Manager. Manager EIR/EIS on a Materials Recovery Facility. Prepared environmental review on Source Reduction/Recycling and Household Hazardous Waste Elements. Prepared Integrated Waste Management Plans. (May 1992 to December 1995)

Environmental Planner - EIP Associates. Project Manager. Prepared EIRs and planning documents on a variety of projects including: a residential/golf course community, the right-of-way preservation/acquisition for light rail, an analysis for a highway corridor redesign, and an analysis for a new university campus. (November 1989 to April 1992)

Project Planner - Michael Clayton & Associates. Assisted in writing EIRs on residential subdivisions and urban in-fill developments and the preparation of the county's Energy, Natural Resources, and Conservation Element and EIR. Also contributed to the preparation of the 120Kv Transmission Line EIS. (January 1987 to October 1989)

EXPERIENCE IN THE PUBLIC SECTOR

City Council, Mayor Pro Tem and Redevelopment Chairman - Winters, California. (June 1990 to June 1994)

Board of Directors of Woodland Hospital. (June 1992 to December 1994)

Contract Planner - City of Davis. Prepared environmental analysis for a city-operated wastewater treatment/wetlands project proposed in conjunction with the Army Corps of Engineers; completed the city's noise ordinance; wrote CEQA clearance for a new community park, and facilitated the preparation of an opportunity and constraints analysis for the realignment of a major drainage ditch. (January 1993 to October 1993)

Contract Planner - City of Sausalito's Design Review Board. Conducted design reviews and made presentations to Design Review Board. (January 1988 to June 1988)

Senior Planner - Marin County Planning Department. Responsible for the processing of Master Plans, Specific Plans, Subdivisions, Design Reviews, Use Permits and Variances; review of building permits, public information and land divisions, and presentations to Design Review Boards, Planning Commission and Board of Supervisors. Prepared a Community Plan Update involving numerous community workshops and public hearings. (June 1984 to December 1986)

Assistant Planner - City of Clearlake. Responsible for reviewing all building and planning applications to assure conformance with city codes and regulations; assisting the public with planning-related matters including zoning, Use Permits, Variances, Subdivisions, Lot Line Adjustments, reversions to acreage, business licenses, and specific development standards. (August 1981 to June 1984)

TEACHING EXPERIENCE

Instructor - University of California Extension Services. Conducted a one-day course through the University of California Extension Services on small town planning, focusing on how small towns can proactively address economic development, growth pressures, environmental concerns, and maintaining small town character. (1992 and 1994)

EDUCATION

Bachelor of Science - Conservation of Natural Resources, with an emphasis in City and Regional Planning. University of California, Berkeley. (1980)

University of California Extension Services - Certificate program courses in Transit Oriented Development, Pedestrian Oriented Development and Traditional Neighborhood Design. (1993-1994)

University of California Extension Services - Certificate program courses in computer graphics, including Photoshop, Pagemaker, Illustrator and TrueSpace. (1995-1996)

**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 prepared the staff testimony on **GEOLOGY AND PALEONTOLOGY**, for the San Francisco Electric Reliability 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 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: February 1, 2006

Signed: _____



At: Reno, Nevada

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

Executive Vice President

Principal Geotechnical Engineer

Education

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

Registrations

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

Associated Experience

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

Experience

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

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

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

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

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

Affiliations

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

Publications

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

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

Awards

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

DECLARATION OF GARY REINOEHL

I, Gary Reinoehl declare as follows:

1. I am presently employed by the California Energy Commission in the Facilities Siting Office of the Systems Assessments and Facilities Siting Division as a Project Manager.
2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.
3. I helped prepare the staff testimony on Cultural Resources for the San Francisco Energy Reliability 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: 2/6/06 Signed: 

At: Sacramento, California

Gary L. Reinobhl
19387 Ponderosa Drive
Pioneer, CA 95666
(209) 295-5589
email: garreb@volcano.net

Education

School	Field	Degree	Year
Portland State University	Major: Mathematics Minor: Anthropology	Bachelor of Arts	1969
Sonoma State University	Cultural Resources Management	Master of Arts	1998

Experience

Western Area Power Administration 2005 to present (PT)
Archeological Technician

Conduct class I, II and III surveys for various electrical projects. Coordinate with other land managing federal agencies involved in electrical projects. Assist in preparing Programmatic Agreements with the California State Historic Preservation Officer (SHPO). Write survey reports to SHPO standards. Prepare cultural resource sections of Environmental Assessments.

State of California, California Energy Commission 2000 to 2004 (FT)
Planner II 2004 to present (PT)

Review cultural resources studies submitted to the Commission by energy permit applicants. Write data request in accordance with Commission regulations. Assess eligibility of cultural resources under California Register of Historical Resources criteria. Conduct independent research for impact analysis of proposed energy projects. Write cultural resources section of the Preliminary and Final Staff Assessments (impact assessments), including conditions for the permit to reduce the impacts to cultural resources to less than significant, if possible. Develop mitigation measures to minimize impact to cultural resources. Review and evaluate the work of consultants. Develop standardized documents and processes to enhance the cultural resources process. Work with other staff to draft changes in the Commission regulations. Consult and coordinate with staff from other state and federal agencies. Review and comment on proposed legislation that affect the California Energy Commission process.

State of California, Department of Transportation 1999 to 2000 (FT)
Associate Environmental Planner

Conduct background research and prepare environmental documents for a variety of highway projects. Assess environmental impacts in accordance with the California Environmental Quality Act and the National Environmental Policy Act. Request permits from various state and federal agencies. Request record searches, conduct historic property surveys, write historic property survey reports, and coordinate with other agencies. Work with Project Management teams and other specialists to meet project deadlines.

State of California, Department of Parks and Recreation 1982 to 1999 (FT & PT)
Associate State Archeologist

Inventory of park properties and State lands from the north coast to the southern desert, including prehistoric sites, historic sites and historic buildings. Excavate prehistoric and historic sites within State Parks for both test purposes and data recovery. Design inventory strategies and excavation strategies for projects on State lands and within State Parks. Provide mitigation measures for projects under the California Environmental Quality Act. Work with historians preparing detailed historic structures reports.

Catalogue and analyze archeological collections; write archeological reports; work with maintenance staff, equipment operators, construction crews, managers, rangers, historians, architects, engineers, personnel staff, accounting staff, convict crews, and the general public; supervise seasonal employees and volunteers; work in both state (California Environmental Quality Act) and federal (National Historic Preservation Act) regulatory contexts and provide advice on the Archeological Resource Protection Act, the Native American Graves Protection and Repatriation Act, National Environmental Protection Act, and State Burial Laws; write programmatic agreements and memorandum of agreements under Section 106 of the National Historic Preservation Act; work with Federal agencies, private contractors, and local agencies; and develop public outreach and educational materials

Sacramento Archeological Society

1994 to 2004 (PT)

Member of Board of Directors

Planned activities of board and society as the Director the Board for two and one half years. Worked with board members to ensure smooth and efficient operation of the Society, including updating the articles of incorporation. Worked with professional archeologists in providing educational and practical experience for the interested public. Assisted in fund raising and public outreach activities for the Society. Coordinated with other interested groups and agencies to enhance the Society's activities. Assisted in developing annual speaker events resulting in public presentations by noteworthy archeologists and anthropologists such as Meave Leakey, Jonathan Kenoyer, James Chatters, and Brian Fagan.

California Institute for Peruvian Studies

1986 to 1987 (PT)

Travel Coordinator and archeological crew chief

Advanced planning for field trips to Peru, escorted volunteers while in Lima, Peru, and continuing their trip until arrival in Acari, Peru. Supervised field crews and coordinated recording and detailed mapping of Nazca period structural remains and other sites in Acari Valley

Additional Experience

1972 to 1982

Eastern Washington University (Kanaka Village Site, Vancouver, WA), U.S. Forest Service (Ochoco National Forest), National Park Service (Petroleum Reserve #4, Alaska; Fort Vancouver National Monument, Vancouver, WA), Archaeological Associates - Northwest, Archaeological Resources Consulting, California State Parks, Oregon Archaeological Society

Professional Societies

Society for California Archeology

**DECLARATION OF
Susan D. Sanders**

I, Susan D. Sanders, declare as follows:

1. I am presently employed by PAR Environmental Services, Inc., a consulting firm under contract with Aspen Environmental Group to provide environmental technical assistance to the California Energy Commission. Under Contract No. 700-02-004, I am serving as a Biological Resource Specialist to support the Energy Facility Planning and Licensing Program for the California Energy Commission in the Biological Resources Office of the Systems Assessments and Facilities Siting Division
2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.
3. I helped prepare the final staff testimony on Biological Resources for the San Francisco Energy Reliability 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: February 7, 2005

Signed: _____

Susan D. Sanders

At: Nevada City, California

Susan D. Sanders

PAR ENVIRONMENTAL SERVICES, INC. Principal Biologist

EDUCATION

Ph.D. Zoology University of California, Davis (1983)

M.A. Zoology University of California, Davis (1979)

B.A. Zoology University of California, Berkeley (1976)

REGULATORY COMPLIANCE EXPERTISE in coordination with state, federal, and local agencies in the environmental review process for projects regulated by the California Environmental Quality Act, National Environmental Policy Act, Federal and State Endangered Species Acts, National Fish & Wildlife Coordination Act, Clean Water Act, and California Coastal Act.

TECHNICAL EXPERTISE in surveys for threatened and endangered wildlife species; biological inventories; habitat management plans; raptor surveys; wildlife habitat assessment; mitigation monitoring; expert testimony, constraints analysis; sensitive species research. Prepared Biological Assessments for endangered, threatened, and candidate species, and conducted field surveys and literature reviews for willow flycatchers, tricolored blackbirds, Swainson's hawks, giant garter snakes, red-legged frogs, burrowing owls, California spotted owls, San Joaquin kit fox, bald eagles, valley elderberry longhorn beetles, vernal pool crustaceans, and many other special-status species.

PROJECT MANAGEMENT EXPERIENCE on large and complex projects, including a two-year survey of 11,000 acres in the Plumas National Forest for a proposed land exchange, involving supervision of eight technical specialists and subconsultants. Responsible for overseeing numerous transportation and revegetation projects and mitigation monitoring programs which involved budget, personnel, and subconsultant management, agency and client coordination, and preparation of technical reports.

CALIFORNIA ENERGY COMMISSION TECHNICAL ASSISTANCE PAR is currently assisting Aspen and the CEC in evaluating the environmental aspects of new power plant applications throughout the state, and also providing technical expertise as an avian specialist. Dr. Sanders is currently involved in the following projects:

- **Pastoria Energy Facility Expansion.** Working with CEC staff, Dr. Sanders met reviewed the Application for Certification and associated reference material, prepared Data Adequacy Form and Data Request and a Preliminary Staff Assessment.
- **San Francisco Energy Reliability Project:** For this project Dr. Sanders reviewed the Application for Certification and related information material, met with CEC staff and United States Fish and Wildlife Service regarding endangered species issues, and prepared a Preliminary Staff Assessment.
- **Black Mountain Wind Energy and 69kV Transmission Line Project:** Acting as CEC's avian specialist, Dr. Sanders reviewed the extensive literature of effects of wind development

on avian populations, met with the Public Interest Energy Research staff, and prepared a comment letter on behalf of CEC for the Notice of Preparation for this project.

CONSULTING EXPERIENCE (1982 - 2005)

Riparian/Wetland Projects Designed and conducted studies of wildlife use of riparian/wetlands and potential impacts of reduced flows and other proposed stream modifications; provided expert testimony. Representative projects include:

- New York Creek Flat Habitat Assessment, Yuba County, Soper-Wheeler Company (PAR)
- Friends of the American River v. BHMJD, Lower American River, Sacramento County (County of Sacramento);
- Teichert/Granite Aggregate Mining Site, Sacramento County (Holliman, Hackard, & Taylor);
- Lower Laguna Drainage Master Plan, Sacramento County (PAR);
- Natomas Ditch Abandonment and Pipeline Construction Project, Sacramento County (PAR);
- Tuolumne River Wildlife Studies for FERC License, Tuolumne County (Holtan & Associates);
- Turner Creek Hydroelectric Project, Plumas County (Jones & Stokes Associates);
- Calabazas Creek Flood Control Project, Santa Clara County (Santa Clara Valley Water District).

Mitigation Monitoring Supervised the design and ongoing monitoring of wetland and sensitive species mitigation projects, including riparian revegetation, vernal pool creation, and mitigation banking. Some projects involved preparation of a Habitat Mitigation and Monitoring Plan, and long-term monitoring efforts (five years plus), as well as preparation of annual reports, and coordination with US Army Corps of Engineers, US Fish and Wildlife Service, California Department of Fish and Game, California Department of Transportation, and the US Environmental Protection Agency. Projects include:

- Dark Horse Mitigation Monitoring, Nevada County (Nevada City Engineering)
- Northpointe, Burrowing Owl Mitigation Monitoring, Sacramento County (PAR)
- Burrowing Owl Mitigation Monitoring, Meadowview, Sacramento County (PAR)
- Wilbur Avenue Overhead Project, Habitat Restoration for Lange's Metalmark Butterfly, Antioch, Contra Costa County. (PAR)
- Swainson's Hawk Nest Monitoring, Garden Highway, Sacramento, Sacramento County (PAR)
- Sierra College Boulevard Riparian Revegetation Monitoring, Roseville, Placer County (PAR);
- Roseville Sanitary Landfill Riparian Revegetation Project, Roseville, Placer County (PAR);
- State Route 99/Calvine Interchange Vernal Pool Vegetation and Fairy Shrimp Mitigation Monitoring, Sacramento County (PAR);
- Potrero Hills Landfill Bird Deterrence Monitoring, Solano County (Global Environmental);
- B&J Sanitary Landfill Bird Deterrence Monitoring, Solano County (Global Environmental);
- State Route 50/Folsom Boulevard Improvement Project, Beach Lakes Mitigation Bank (PAR);
- Niblick Bridge Riparian Revegetation and Mitigation Monitoring, San Luis Obispo County (PAR).

CEQA/NEPA Documents. Prepared biological resource sections of Environmental Impact Reports/Statements, Initial Studies, and Environmental Assessments for numerous commercial and residential developments, redevelopment projects, transportation projects, dams, and other water projects throughout northern California. Conducted wildlife and plant community surveys, habitat assessments, agency contacts, data analysis and report preparation. Secured 1602 Streambed Alteration Agreements from California Department of Fish and Game, Section 404 Permits from U.S. Army Corps of Engineers, and 401 Permits from Regional Water Quality Control Board. Some representative projects include:

- Folsom Corporation Yard Redevelopment Plan Project, Sacramento County (PAR Environmental Services, Inc. [PAR]);
- Laguna Creek Interceptor and Sewer Alignment Constraints Study, Sacramento County (PAR);
- Marin Public Safety and Emergency Radio System Project, Marin County (Cord Communication)
- Biological Studies for Endangered Species Compliance, Isabella Dam, Kern County (PAR);
- Granite Quarry, Placerville (The Bedrock Group);
- Pacific-Bell Rocklin Central Dialing Station, Rocklin, Placer County (PAR);
- Whitney Oaks Raptor Surveys, Placer County (Live Oak Enterprises/Pulte Homes),
- Crosswood Project Access Roads, Placer County (Planning Center);
- Auburn Ranch Subdivision Project, Placer County (Arca West Engineers);
- Equestrian Ridge Estates, Placer County (PAR);
- Willow Creek Assessment District Swainson's Hawk Surveys, Sacramento County (PAR);
- Bucks Lake Spotted Owls Surveys, Menasha Corporation, Plumas County (PAR);
- Roseville Water Facilities Project, City of Roseville, Placer County (Geier & Geier Consulting);
- Hidden Falls Planned Unit Development, Placer County (JJD Properties);
- Sugar Bowl Ski Resort Expansion, Placer County (Omni-Mears, Engineers/Planners),
- City of Lincoln Waste Water Treatment Plant Expansion, Placer County (City of Lincoln);
- Lucky/Hatch Annexation, San Joaquin County (Greystone Environmental);
- The Heritage at Bickford Ranch, Placer County (Geobotanical Phenomenology);
- Dixon Garden Apartments, Dixon, Solano County (Planning Concepts);
- South Branch 60 kV Pole Line Project, Roseville, Placer County (PAR);
- Smith-Moulton Pipeline Project, Nevada County (PAR);
- Morada Ranch Annexation, San Joaquin County (Omni-Mears);
- Clover Valley Lakes Estates EIR, Placer County (Planning Concepts);
- Turtle Island, Loomis, Placer County (Export International);
- Fort Hunter-Liggett Wildlife Resource Surveys, Monterey County (Jones & Stokes Associates);
- Superconducting Super Collider EIR/EIS, Yolo and Solano Counties (EIP Associates);
- South Lake Tahoe Redevelopment Agency EIR, El Dorado County (Wagstaff & Brady);
- Stanford Ranch EIR, Placer County (Jones & Stokes Associates);
- Northeast Roseville Specific Plan EIR, Placer County, Placer County (Jones & Stokes Associates).

Transportation Projects. Prepared Caltrans Natural Environment Study Reports, Categorical Exemption/Exclusions, Preliminary Environmental Study Forms, and other documentation for bridge replacements, interchange modifications, seismic retrofits, road widenings, emergency storm damage repairs, and other transportation projects in Caltrans Districts 1, 2, 3, 4, 5, and 10. Projects include:

- I-580/Isabel Avenue Interchange Project, Livermore, Alameda County (PAR);
- Gladding Road Bridge Replacement, Coon Creek, Placer County (Planning Concepts);
- Lozanos Road Bridge Replacement, Auburn Ravine, Placer County (PAR);
- Coyote Creek Bridge Replacement Project, Calaveras County (PAR);
- Route 99/Route 120 East Interchange Project, Manteca, San Joaquin County (PAR);
- Route 99/Prado Road Interchange, San Luis Obispo County (PAR);
- Ralston Avenue/Route 101 Interchange, Belmont, San Mateo County (PAR);
- Route 1 Improvement Project, Sand City to Seaside, Monterey County, PEAR (PAR);
- Northeast Area Transportation Plan, Constraints Analysis, Sacramento (PAR);
- Wilbur Avenue Overcrossing Project, Antioch, Contra Costa (PAR);
- Alpine Road Storm Damage Repair, San Mateo County (PAR);
- Pescadero Road Storm Damage Repair, San Mateo County (PAR);
- Route 92 Widening, Half Moon Bay, San Mateo County (PAR);
- Route 99/Hammer Lane Interchange Improvements, Stockton, San Joaquin County (PAR);
- Hammer Lane Widening, Stockton, San Joaquin County (PAR);
- La Gonda Way and Paraiso Drive Bridge Seismic Retrofit, Danville, Contra Costa County (PAR);
- Highway 162 Bridge Storm Damage Repair Project, Sacramento River, Glenn County (PAR);
- Norwood Avenue Reconstruction Project, Sacramento County (Planning Center);
- HOV Lane Construction, US 50, Sunrise to El Dorado Blvd., Sacramento/El Dorado Co. (PAR);
- Dry Creek Bridge Replacement Project, Route 99, Butte County (PAR);
- Ladies Canyon Bridge Storm Damage Repair, Sierra County, (PAR);
- Emergency Storm Damage Repair, Routes 49 and 89, Sierra and Nevada Counties, (PAR);
- Emergency Storm Damage Repair Project for: Route 70/89, Feather River Canyon, Route 20, 147, Plumas, Nevada, and Butte Counties, (PAR);
- Interstate 5 - Benjamin Holt/Hammer Lane Interchange project, San Joaquin County (PAR);
- State Route 113/Interstate 5 Connector Study, City of Woodland, Yolo County, California (PAR);
- Frederickson Road Widening, Antioch, Contra Costa County (May Consulting);
- East Lime Kiln Road Reconstruction Project, Nevada County (PAR);
- Lower Sacramento Road and Bridge Widening, Stockton, San Joaquin County (May Consulting);
- Sierra College Boulevard Widening Project, Roseville, Placer County (PAR);
- State Route 50/Folsom Interchange Improvement Project, Sacramento County (PAR);
- Pico Creek Bridge Replacement Project, Route 1, San Luis Obispo County (PAR);
- Burns Creek Bridge Replacement Project, Route 1, Monterey County (PAR);
- Pajaro River Bridge Replacement Project, Monterey and San Luis Obispo Counties (PAR);

Resume of Susan Sanders

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- Route 113 Widening/North 1st Street Improvements, Dixon, Solano County (Planning Concepts);
- Bridgeport School Bridge Replacement Project, El Dorado County (PAR);
- State Route 49 Widening, Auburn, Placer County (PAR);
- Claus Road Bridge Widening, Modesto, Stanislaus County (PAR);
- Interstate 80/Enterprise Boulevard Interchange, City of West Sacramento, Yolo County (PAR).

HEP Analysis Conducted Habitat Evaluation Procedure (HEP) analyses for Farmington Canal Project, Calaveras County, and Calabazas Creek flood control project, Santa Clara County. Co-author of Habitat Suitability Model for Willow Flycatcher.

Land Exchanges. Prepared Biological Assessments/Evaluations for Forest Service land exchanges in the Plumas National Forest. The largest of these was the 11,000 acre Super-Wheeler Company land exchange, a two-year project requiring management of eight employees and several subconsultants for surveys of rare plants, California spotted owls, northern goshawks, red-legged frogs, and other sensitive species. Other projects include the Crites Mineral Fraction Land Exchange and the Saunders Land Exchange, Plumas National Forest, (PAR Environmental Services, Inc.).

TEACHING EXPERIENCE

Lecturer. Biology 10, UCD Zoology Department (1985): Instructor - biology for non-majors.

Lab Coordinator. Zoology 2L, UCD Zoology Department (1983-1984): Trained and supervised teaching assistants, managed introductory zoology laboratories.

Teaching Assistant. UCD Zoology Department (1977-1983): General Zoology, Vertebrate Structure, Introductory Biology.

Outstanding UCD Graduate Teaching Assistant (1983).

PUBLICATIONS

Beedy, E. C., S. D. Sanders, and D. A. Bloom. 1991. Breeding status, distribution, and habitat associations of the tricolored blackbird (*Agelaius tricolor*), 1850-1989. June 21, 1991 Jones & Stokes Associates (JSA 88-187.) Sacramento, CA. Prepared for UWFWS, Sacramento, CA.

Sanders, S. D. and M. A. Flett. 1989. The ecology of a Sierra Nevada population of Willow Flycatchers (*Empidonax traillii*), 1986 and 1987. California Management Branch Administrative Report No. 89-3, California Department of Fish and Game.

Harris, J. D., S. D. Sanders, and M. A. Flett. 1987. Willow Flycatcher surveys in the Sierra Nevada. Western Birds. 18:27-36.

Resume of Susan Sanders

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Flett, M. A. and S. D. Sanders. 1987. Ecology of a Sierra Nevada population of Willow Flycatchers. *Western Birds*. 1:37-42.

Sanders, S. D. 1983. Foraging Ecology of a Sierra Nevada population of Douglas Tree Squirrels (*Tamiasciurus douglasii*). Ph.D. Dissertation, University of California, Davis.

**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 Systems Assessments and Facilities Siting Division as a Sr. 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 testimonies on Hazardous Materials Management and Worker Safety Fire Protection, for the San Francisco Energy Reliability 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: _____

2/14/05

Signed: _____



At: _____

Sacramento, California

RICK TYLER

Associate Mechanical Engineer

CALIFORNIA ENERGY COMMISSION

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 - Senior 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-
Apr. 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
PRESENTATIONS
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 instructions, 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.

RESUME

DECLARATION OF
William Walters, P.E.

I, **William Walters**, declare as follows:

1. I am presently employed by Aspen Environmental Group, a contractor to the California Energy Commission, Systems Assessment and Facilities Siting Division, as a senior associate in engineering and physical sciences.
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 **Visual Resources (Visible Plume Modeling Analysis)**, for the **San Francisco Electric Reliability 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: January 30, 2006

Signed: _____



At: Agoura Hills, California

WILLIAM WALTERS, P.E.
Air Quality Specialist

ACADEMIC BACKGROUND

B.S., Chemical Engineering, 1985, Cornell University

PROFESSIONAL EXPERIENCE

Mr. Walters has over 19 years of technical and project management experience in environmental compliance work, including environmental impact reports, RCRA/CERCLA site assessment and closure, site inspection, source monitoring, emissions inventories, source permitting, and energy and pollution control research.

Aspen Environmental Group

2000 to present

Responsible as lead technical and/or project manager of environmental projects. Specific responsibilities and projects include the following:

- Preparation of the Air Quality sections for two separate Department of Water Resources Santa Ana Valley Pipeline Repairs Project CEQA Categorical Exemption Memorandums
- Assistance in the preparation of the Air Quality Sections for the Department of Water Resources Tehachapi Second Afterbay Project Initial Study and EIR.
- Preparation of the Air Quality Inventory for the Los Angeles Department of Water and Power River Supply Pipeline Project EIR.
- Project management and preparation of the Air Quality Section for the Los Angeles Department of Water and Power Valley Generating Station Stack Removal IS/MND support project.
- Preparation of the Air Quality Section and General Conformity Analysis for the Matilija Dam Ecosystem Restoration Project EIS/R for the United States Army Corps of Engineers (Corps)
- Preparation of emission inventory and General Conformity Analysis of the Murrieta Creek Flood Control Project and the Joint Red Flag exercise to be conducted in the Nevada Test and Training Range for the Corps.
- Emission inventory for the construction activities forecast for the San Jose/Old San Jose Creeks Ecosystem Restoration project for the Corps.
- Preparation and project management of the air quality section of the Staff Assessment and/or Initial Study and the visual plume assessment for the following California Energy Commission (CEC) licensing projects: Hanford Energy Park; United Golden Gate, Phase I; Huntington Beach Modernization Project (including Expert Witness Testimony); Woodland Generating Station 2; Ocotillo Energy Project, Phase I; Magnolia Power Project; Colusa Power Project; Inland Empire Energy Center; Rio Linda/Elverta Power Plant Project; Roseville Energy Center; Hemet/Peaker Project; Tracy Peaking Power Plant Project (including Expert Witness Testimony); Avenal Energy Project; San Joaquin Valley Energy Center (including expert witness testimony); Salton Sea Unit 6 Project (including expert witness testimony); Modesto Irrigation District Electric Generation Station (including expert

- witness testimony); Walnut Energy Center (including expert witness testimony); Riverside Energy Resource Center (including expert witness testimony); and Pastoria Energy Facility Expansion.
- Preparation and project management of the visual plume assessment for the following California Energy Commission (CEC) licensing projects: Metcalf Energy Center Power Project (including Expert Witness Testimony); Contra Costa Power Plant Project (including Expert Witness Testimony); Mountainview Power Project; Pobero Power Plant Project; El Segundo Modernization Project; Morro Bay Power Plant Project; Valero Cogeneration Project; East Altamont Energy Center (including expert witness testimony); Russell City Energy Center; SMUD Cosumnes Power Plant Project (including expert witness testimony); Pico Power Project; Blythe Energy Project Phase II; City of Vernon Malburg Generating Station; San Francisco Electric Reliability Project; Los Esteros Critical Energy Facility Phase II, and Roseville Energy Park (in progress)
 - Preparation and project management of the public health section of the Inland Study for the Woodland Generating Station 2 CEC licensing project.
 - Preparation of project amendment or project compliance assessments, for air quality or visual plume impacts, for several licensed power plants, including: Metcalf Energy Center; Pastoria Power Plant; Elk Hills Power Plant; Henrieta Peaker Project; Tracy Peaker Project; Magnolia Power Project; Delta Energy Center; SMUD Cosumnes Power Plant; Walnut Energy Center; San Joaquin Valley Energy Center; City of Vernon Malburg Generating Station; Otay Mesa Power Plant; Los Esteros Critical Energy Facility; Pico Power Project; Riverside Energy Resource Center; Blythe Energy Project Phase II; Inland Empire Energy Center, and Salton Sea Unit 6 Project.
 - Preparation and instruction of a visual water vapor plume modeling methodology class for the California Energy Commission.
 - Assistance in the preparation of the noise assessment section of the Staff Assessment for the Contra Costa Power Plant CEC licensing project.
 - Assistance in the aircraft safety review of thermal plume turbulence for the Riverside Energy Resources Center; and the Blythe Energy Power Plant; and Blythe Energy Project Phase II (including expert witness testimony) siting cases. Assistance in the aircraft safety review of thermal and visual plumes of the operating Blythe Energy Power Plant.
 - Preparation of the air quality section of the staff paper "A Preliminary Environmental Profile of California's Imported Electricity" for the CEC and presentation of the findings before the Commission.
 - Preparation of the draft staff paper "Natural Gas Quality: Power Turbine Performance During Heat Content Surge", and presentation of the preliminary findings at the California Air Resources Board Compressed Natural Gas Workshop and a SoCalGas Technical Advisory Committee meeting
 - Preparation of the staff paper "Emission Offsets Availability Issues" and preparation and presentation of the Emission Offsets Constraints Workshop Summary paper for the CEC.
 - Preparation of the Air Quality section of the PG&E Hydrodivestiture Draft EIR/EIS for the California Public Utilities Commission (CPUC).
 - Preparation of permit applications, emission calculation spreadsheets, and an air quality compliance manual for Desa International's Southern California manufacturing facility.
 - Preparation of the Air Quality Section of the LAUSD New School Construction Program EIR and provided traffic trip and VMT calculation support for the Traffic and Transportation Section. As part of this project attended two public scoping meetings.

- Management and preparation of the Draft Air Quality Sections for the Reseda Senior High School Portable Addition (S/MND) and Wonderland Elementary Addition (S/MND) projects for LAUSD.
- Technical review and updating of the Air Quality Section for the Valley High School No. 1 EIR (CSUN), Jefferson No. 6 Primary Center MND, Southern Regional Elementary School #1 MND, and Central Regional Elementary School #16 MND projects for LAUSD.
- Preparation of the Air Quality Sections and/or impacts modeling assessments for the Central Regional Middle School #7 MND and Southern Regional Middle School #6 EIR projects.
- Revision of the Risk Management Plan (RMP) for the SSI Foods Wilder Idaho Facility Ammonia Refrigeration Systems.
- Preparation of a control technology evaluation for the control of nuisance odors from wood-fired pizza ovens for the A16 restaurant in San Francisco, California.
- Preparation of the Air Quality Section of the Environmental Information Document in support of the Coastal Consistency Determinations for the suspension of operation requests for undeveloped units and leases off the Central California Coast.
- Preparation of comments on the Air Quality, Alternatives, Marine Traffic, Public Safety, and Noise section of the Cahillo Port Liquefied Natural Gas Deepwater Port Draft EIS/EIR for the City of Oxnard.
- Preparation of an odor and health impact study in support of the Ventura County Pina Area Plan Update EIR.

Camp Dresser & McKee, Inc.

1998 to 2000

Mr. Walters was responsible as lead technical and/or project manager of environmental projects. Specific responsibilities and projects include the following:

- Preparation of emission inventories and dispersion modeling for criteria and air toxic pollutants for the Los Angeles International Airport Master Plan (LAXMP) EIS/EIR.
- Project Manager/Technical lead for the completion of air permit applications and air compliance audits for two Desa International fireplace accessory manufacturing facilities located in Santa Ana, California.
- Air quality audit for a confidential can manufacturing company at two manufacturing sites.
- Project manager/technical lead for the completion of Risk Management Plans (RMPs) for four J.R. Simplot food processing facilities in Oregon, Idaho, and Washington and the Consolidated Reprographics facility located in Irvine, California. Project manager for the concurrent Process Safety Management plan support for the J.R. Simplot Hermiston (Oregon) and Heyburn (Idaho) facilities and the project manager/technical lead for the RMP support for the SSI food processing facility in Wilder, Idaho, and the Atlantic Custom Processors food processing facility in Fort Fairfield, Maine.
- Completion of an environmental tax credit application for the J.R. Simplot Hermiston Oregon food products facility.

Planning Consultants Research

1997 to 1998

Mr. Walters was responsible as lead technical and/or project manager of environmental projects. Specific responsibilities and projects include the following:

- Project Manager for a stationary source emission audit of the entire Los Angeles International Airport complex for Los Angeles World Airports (LAWA) in support of the LAXMP.
- Review of the Emission Dispersion Modeling System (EDMS) and preparation of a report with findings to the Federal Aviation Administration for LAWA in support of the LAXMP.
- Project manager for the ambient air monitoring and deposition monitoring studies performed for LAWA in support of the LAXMP, including the selection of the monitoring sites and specialty subcontractor, and review of all monitoring data.
- Completion of intersection "CO Hotspots" modeling, ambient monitoring, and deposition monitoring reports for LAWA in support of the LAXMP.

Aspen Environmental Group/Clean Air Solutions

1995 to 1996

Mr. Walters was responsible as lead technical and/or project manager of environmental projects. Specific responsibilities and projects include the following:

- Manager of the Portland, Oregon, office of Clean Air Solutions from March 1995 to December 1995, with responsibilities including Project Management, Business Development, and Administration.
- Control technology assessment, engineering support and Notice of Intent to construct preparation for J.R. Simplot's Hermiston, Oregon, food processing facility. Review and revision of an Air Contaminant Discharge Permit application, Title V permit application, and PSD modeling analysis for J.R. Simplot's Hermiston facility.
- Air quality compliance report including an air emission inventory, regulation and permit compliance determination, and recommendations for compliance for Lumber Tech, Inc.'s Lebanon, Oregon, wood products facility.
- Source test methodology and equipment selection for testing inlet and outlet concentrations of total petroleum hydrocarbon and benzene from soil gas extraction/oxidation units for Cascade Earth Sciences, Ltd.
- Preparation of a Tier II (synthetic minor) permit application for the American Fine Foods' Payette, Idaho, food processing facility.
- Emission inventory and compliance evaluation for Simplot's Aberdeen, Idaho, food processing facility.
- Preparation of an Air Contaminant Discharge permit application for Maclette Homes, Inc. Hermiston, Oregon, manufactured housing facility.
- Preparation of a Title V permit application for Simplot's Helix, California, fertilizer manufacturing facility.
- Source test contractor selection and test oversight for J.R. Simplot's food processing plant in Hermiston, Oregon, and Boise Cascade's wood-fired boiler in Willamina, Oregon.

Fluor Daniel, Inc.

1990 to 1995 and 1996 to 1997

Mr. Walters was responsible as lead technical or project manager for major environmental projects for both government and private clients. His projects included:

- Prepared several air permit applications for the ARCO Los Angeles Refinery Polypropylene Plant Project.

- Phase I environmental assessments for seven properties located in Southern California.
- Prepared Environmental Baseline Reports for 33 sites in Guam for the U.S. Navy.
- Prepared site investigation and RCRA closure plan report for Olin Hunt Specialty Chemical's Vernon, California, hazardous waste storage site.
- Project manager of the Anaconda Smelter site for the U.S. Environmental Protection Agency's (EPA) Alternative Remedial Contract System (ARCS) project during the conclusion of technical activities and project closeout. Prepared a cost recovery report for the project.
- Task manager for nine site investigations under the EPA Region VI ARCS contract. Project activities included data collection, work plan preparation, field sampling, final report preparation, and Hazard Ranking System (HRS) PRescore preparation.
- For the Hanford (Washington) Waste Vitrification Project, prepared an air emission inventory for criteria pollutants, prepared an emission inventory and compliance evaluation of toxic air pollutants, performed compliance review of design drawings and equipment specifications, analyzed failure probability and consequence analysis of design-basis accidents.
- Prepared fugitive and point source VOC emission estimates and performed a "Top-Down" BACT analysis for a 217 MMbtu/hr steam boiler for a proposed ethanol production facility in Great Falls, Montana.
- Performed environmental analysis for the Bonneville Power Authority, including air pollution BACT analysis, wastewater analysis, and evaluation of secondary environmental effects of electric power producing technologies.

Jacobs Engineering Group

1988 to 1990

Mr. Walters was responsible for a wide range of air pollution regulatory and testing projects, including the following:

- Project manager of air toxic emission inventory reports (under California's AB2588), prepared for U.S. Borax's boron mining and refining facility and the Naval Aviation Depot (North Island Naval Base, San Diego, California).
- Prepared air permit applications and regulatory correspondence for several facilities:
 - U.S. Department of Energy's Feed Material Production Center uranium processing facility in Fernald, Ohio
 - Emission sources at a confidential high technology electronics manufacturing facility
 - Evaluation of a sludge dewatering process at Unocal's Wilmington, California, Refinery
 - United Airlines blade repair facility at the San Francisco Airport
 - Relocation of Kerr-McGee's rocket fuel storage and blending facility to Apex, Nevada.
- Prepared source testing plans, Quality Assurance/Quality Control (QA/QC), and testing oversight for several facilities, including: QA/QC for RCRA air emissions sampling plan for the Department of Defense's Chem-Demil facility on Johnston Atoll; prepared plan and provided QA/QC and field oversight for emissions testing at Baxter Healthcare in Irvine, California, and prepared plan and provided testing oversight for Kerr-McGee's existing ammonium perchlorate manufacturing facility in Henderson, Nevada.
- Completed identification of air permitting regulations and control technology requirements for a proposed 30,000 barrel per day catalytic cracking unit for Coastal Corporation's Pacific Refinery, located in Hercules, California.

- Characterized and quantified air emissions for offshore oil and gas development activities associated with Federal oil and gas Lease Sale 95, offshore southern California, for the U.S. Minerals Management Service.
- Assisted in selection and design of air pollution control equipment for various clients.
- Prepared environmental reports, including waste stream quantification and characterization for several proposed facilities, including:
 - Lake Minerals proposed soda ash plant at Owens Lake, California
 - Masal's proposed potash facility located on the Salar de Atacama in Chile.

San Joaquin County Air Pollution Control District

During 1987 and 1988

Mr. Walters served as an air pollution engineer and was responsible for the following: start-up site inspections of air pollution sources; monitoring source tests and evaluating source test reports; permitting minor and major sources of air pollutants; processing emission banking applications; and aiding in the preparation of the District's Best Available Control Technology (BACT) quarterly reports, Reasonable Further Progress reports, and emission inventories.

Adelphi Center for Energy Studies

1985 to 1986

Mr. Walters served as a combustion facility manager/research engineer and was responsible for the following: management and implementation of all conventional and novel fuel combustion projects, including the preparation of interim and final reports, conducting source tests using EPA methods 1-4 and 17, and the data analysis of all combustion tests; maintenance and repair of all combustion facility equipment; preparation of all combustion project proposals, and implementation and data analysis of fuel atomization studies, fuel rheology research, and bench scale coal ash removal research.

CERTIFICATIONS

- Chemical Engineer, California License 5973
- CARB, Fundamentals of Enforcement Seminar
- EPA Methods 1-8, 17; Training Seminar

AWARDS

- California Energy Commission Outstanding Performance Award 2001

PAPERS

Authored

"Current and Future Air Pollution Emission Offset Requirements, and Impacts to the Pacific Northwest", PNWIS/CPANS Air and Waste Management Chapters Annual Meeting, November 17, 1995.

Co-Authored

"Gas Co-Firing of the CWF for Package Boiler Applications", Presented at the Third Annual Pittsburgh Coal Conference, September 1986.

"Implications of Slurry Fuel Rheology on Atomization," American Society of Engineers.

"Factors Affecting Atomization of CWF", Presented at the Eighth International Symposium of Coal Slurry Fuel Preparation and Utilization, Orlando, FL May 1986.