

Final Staff Assessment

**CALIFORNIA
ENERGY
COMMISSION**

EL SEGUNDO POWER REDEVELOPMENT PROJECT

Application For Certification (00-AFC-14)
Los Angeles, California



STAFF REPORT

SEPTEMBER 2002
(00-AFC-14)



Gray Davis, Governor

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**CALIFORNIA
ENERGY
COMMISSION**

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EXECUTIVE SUMMARY

INTRODUCTION

This Final Staff Assessment (FSA) contains the Energy Commission staff's analysis and recommendation on the El Segundo Power Redevelopment Project (ESPR). The ESPR and related facilities, such as the electric transmission lines, water supply lines, and wastewater lines, are under the Energy Commission's jurisdiction (Pub. Resources Code §§ 25500 et seq.). When issuing a license, the Energy Commission acts as lead state agency (Pub. Resources Code § 25519(c)) under the California Environmental Quality Act (Pub. Resources Code §§ 21000 et seq.), and its process is functionally equivalent to the preparation of an environmental impact report (Pub. Resources Code § 21080.5).

The primary responsibility of the Energy Commission staff is to provide an independent assessment of the project's potentially significant effects on the environment, the public's health and safety, conformance with all applicable laws, ordinances, regulations and standards (LORS), and measures to mitigate any identified significant effects. The South Coast Air Quality Management District provided its final Determination of Compliance with District rules and regulations, and staff has incorporated it into the Air Quality section. Energy Commission staff has completed this FSA, which represents staff's independent assessment and recommendation to the Commissioners of the California Energy Commission, the decision-makers in this proceeding. The FSA is not a Committee document nor is it a final or proposed decision on the proposal.

During evidentiary hearings, the Energy Commission Committee assigned to the ESPR proceedings will consider and weigh the testimony and recommendations of all interested parties, including Energy Commission staff, the applicant, intervenors, public, City of El Segundo, and other local, state and federal agencies, before issuing the Presiding Member's Proposed Decision for consideration by the full Commission. The analyses contained in this document were prepared in accordance with Public Resources Code sections 25500 et seq.; the California Code of Regulations, title 20, sections 12001 et seq.; and the California Environmental Quality Act (Pub. Resources Code §§ 21000 et seq.) and its guidelines (title 14, Cal. Code of Regs. §§ 15000 et seq.).

PROJECT DESCRIPTION

On December 21, 2000, EL Segundo Power II LLC (ESP II) filed an Application for Certification (AFC) seeking approval from the California Energy Commission to replace the existing El Segundo Generating Station (ESGS) Units 1 and 2 in the City of El Segundo with a 630 megawatt (MW) natural gas-fired, combined cycle electric generation facility. On February 7, 2001, the California Energy Commission found the AFC to be data adequate.

The applicant proposes to modify an existing power plant in El Segundo, California, an incorporated city in Los Angeles County. The ESGS site consists of 3 contiguous parcels approximately 34 acres in size.

The site is bordered by Vista Del Mar and the Chevron Refinery on the east, Santa Monica Bay on the west, 45th Street of the City of Manhattan Beach on the south and the Chevron Marine terminal on the north. The facility is located at Township 3 South, Range 15 West, of the Venice USGS Quadrangle Map. See **Project Description Figure 1**.

The ESPR Project is proposed on land currently zoned for a power plant. The new combined cycle facility is expected to generate 630 megawatts (MW) under nominal conditions. This is 280 MW more than the old Units 1 and 2 were capable of generating when operating. The project includes demolition and removal of the existing Units 1 and 2 and their replacement with Units 5, 6, and 7 in the footprint of Units 1 and 2. The applicant proposes to use the existing steam cycle heat rejection system, which utilizes cooling water from Santa Monica Bay, for the new equipment. The existing ESGS Units 3 and 4 located adjacent to Units 1 and 2 will not be modified by this project.

New connections to the existing adjacent SCE-owned 230 kilovolt (kV) switchyard will be added as part of the proposed project. No new transmission lines will be built. Natural gas will be supplied to the project via an existing pipeline.

The project will use Selective Catalytic Reduction (SCR), a dry, low NO_x combustor and an oxidation catalyst system to reduce air emissions. Aqueous ammonia for SCR will be supplied from the Chevron Refinery through a pipeline under Vista Del Mar, via an existing underpass. The aqueous ammonia will be stored in an existing 20,000-gallon underground storage tank.

Water requirements for the project are estimated at 207 million gallons per day at full operation and are proposed to be supplied from a combination of sources. The applicant has proposed that the new units use the existing seawater cooling system without modifying the intake or outfall structures and lines. The City of El Segundo, through purchases from the Metropolitan Water District, will supply potable water. The plant will be using approximately 180,000 gallons per day. A new 1.55-mile pipeline will be installed in El Segundo city streets to supply this water. The West Basin Municipal Water District will supply approximately 86,000 gallons of reclaimed water per day for both irrigation and for pumps and bearings seal water augmentation. A new 1.75-mile pipeline will be installed in El Segundo city streets to supply this water. Wastewater discharge will be into the City of Manhattan Beach Sanitary Sewer System via a new 3-inch water pipeline hookup on the 45th Street side of the plant.

The project is estimated to have a capital cost plus labor of approximately \$480 million. If approved, construction of the ESPR, from site preparation to commercial operation is expected to take approximately 20 to 26 months. The project will require a construction workforce of approximately 422 craftspersons over the proposed demolition and construction period. The construction period will begin immediately after a four to six month site preparation phase that will include demolition of units 1 and 2 and the modification of the fuel storage tanks for use as a domed laydown area. Once the ESPR project is complete, operation of the redeveloped ESGS, including existing Units 3 and 4, will require a minimum of 50 skilled workers.

PUBLIC AND AGENCY COORDINATION

Publicly noticed workshops on air quality, water resources, biological resources, cultural resources, noise, visual resources, traffic and transportation, and other issues have been held in El Segundo. These workshops have been highly productive.

In addition to these workshops, extensive coordination has occurred with the numerous local, state and federal agencies that have an interest in the project. Particularly, Energy Commission staff has worked with the Cities of El Segundo, Manhattan Beach, and Los Angeles; Los Angeles County; California Independent System Operator (Cal-ISO); South Coast Air Quality Management District; California Air Resources Board; FAA; U.S. Environmental Protection Agency; California Coastal Commission; U.S. Fish and Wildlife Service; National Marine Fisheries Service; California Departments of Fish and Game and Parks and Recreation; U.S. Army Corp of Engineers, and the Los Angeles Regional Water Quality Control Board to identify and resolve issues of concern. In addition, Commission staff has coordinated the review and analysis of the project with intervenors and interested residents of the community.

A publicly noticed workshop will be conducted on this FSA during late September or early October, 2002. The workshop will assist the parties in determining the current status of remaining issues. If necessary, staff will address information gathered and comments received in supplemental testimony prior to evidentiary hearings.

CALIFORNIA COASTAL COMMISSION

The California Coastal Commission has the lead responsibility for determining a power plant's consistency and suitability with the Coastal Act. Section 30413 of the Coastal Act requires the Coastal Commission to prepare a consistency and suitability report to the Energy Commission on any new power generating facility proposed to be located within the designated Coastal Zone (Pub. Resources Code §30413). This report includes findings on the "conformance of the proposed site and related facilities with the certified coastal programs in those jurisdictions which would be affected by any such development" (Pub. Resources Code §30413 (d)(5)). Under the Warren-Alquist Act, the Energy Commission must include in its decision the provisions recommended by the Coastal Commission unless the Energy Commission determines that the provisions would result in a greater adverse effect on the environment or that the provisions would not be feasible for the project (Pub. Resources Code, §25523(b)).

The Coastal Commission issued reports addressing the project's impacts on visual resources on March 6, 2002, and on biological resources on April 9, 2002. The Coastal Commission findings and recommendations on other aspects of the project will be issued following publication of this FSA. For visual resources, the Coastal Commission found that the project as proposed is not consistent with the policies of the Coastal Act, and recommended specific provisions that, if implemented, would make the project consistent. These provisions are discussed below in the **VISUAL RESOURCES** section.

Since these findings were issued, the applicant has provided a new proposal for mitigating the visual impacts of the project. Coastal Commission staff and Energy Commission staff have reviewed the current proposal, and agree that it provides additional mitigation and visual enhancement of the ESGS site. The two staffs also agree, however, that the proposal does not yet meet the requirements of the specific provisions recommended by the Coastal Commission.

For biological resources, the Coastal Commission again found that the project as proposed is not consistent with Coastal Act policies. In this case, the Coastal Commission deferred identification of specific provisions necessary to bring the project into conformance with the Coastal Act until adequate information on the biological impacts of the project is available. Again, this issue is discussed in more detail below in the **BIOLOGICAL RESOURCES** section.

After the Coastal Commission issued its report on biological resources, Energy Commission staff conducted an analysis of the use of reclaimed water in place of seawater in the once-through cooling system. Energy Commission staff have determined that this is a feasible means to avoid marine biological impacts. Coastal Commission staff considers this to be an promising possibility, but has not yet completed a full analysis of this cooling option for consideration by the Coastal Commission.

Energy Commission staff anticipates a final Coastal Commission report on the balance of the project and its impacts to be completed following publication of this FSA. This final report should be available before the close of evidentiary hearings, and Energy Commission staff anticipates it may be available by the start of hearings.

CALIFORNIA STATE LANDS COMMISSION

The State Lands Commission informed staff in April 2002, that the 49-year lease on the two sea water-cooling systems expires October 27, 2002. The applicant has yet to file an extension or renewal request. The lease will revert to a month-to-month lease for up to a year unless the State Lands Commission votes in the affirmative to terminate it. The State Lands Commission staff has indicated that it plans to use this FSA for its CEQA analysis.

STAFF'S ASSESSMENT

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

- the environmental setting of the proposal;
- impacts on public health and safety, and measures proposed to mitigate these impacts;
- environmental impacts, and measures proposed to mitigate these impacts;
- the engineering design of the proposed facility, and engineering measures proposed to ensure the project can be constructed and operated safely and reliably;

- project closure;
- project alternatives;
- compliance of the project with all applicable LORS during construction and operation; and
- proposed conditions of certification.

OVERVIEW OF STAFF'S CONCLUSIONS

Environmental / System Impacts and LORS

Staff's analysis indicates that the project's environmental impacts can be mitigated to levels of less than significant in all areas except for Biological Resources. Staff's analysis also indicates that the project can be made to conform with all LORS. Below is a summary of the potential environmental impacts and LORS compliance for each technical area.

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

AIR QUALITY

The South Coast Air Quality Management District has submitted a Final Determination of Compliance that concludes that the ESPR will comply with all applicable District rules and regulations. However, under the requirements of CEQA, the applicant has yet to identify all required emissions reduction credits to fully offset project emissions. Because ESPR's emissions of PM10 and SO2 are not fully mitigated and thus can be

expected to cause or contribute to a new violation of the 24-hour PM10 standards (both federal and state) if left unmitigated, staff cannot make a recommendation for approval.

BIOLOGICAL RESOURCES

Staff has concluded that the aquatic biological studies provided by the applicant are inadequate. Staff has consistently recommended that the applicant conduct a 316(b)-like entrainment study since the AFC was initially filed. The applicant has not done the study, and instead performed a study of a nearby aquatic environment to estimate potential environmental impacts of the project. Staff reviewed the information provided and determined that it does not provide sound scientific data for evaluating the project's impacts.

The California Coastal Commission, National Marine Fisheries Service and California Department of Fish and Game agree with staff's analysis and requirements for aquatic biological studies as contained in the FSA Biological Resources section. The Coastal Commission has found that the project as proposed is not consistent with Coastal Act policies relating to protection of marine biological resources.

Because of the lack of sound scientific data to determine the potential direct impacts on aquatic biology and the fact that the project as proposed would contribute to a significant unmitigated cumulative impact, staff cannot recommend approval of the project at this time.

Staff has performed an Alternative Cooling Study to examine the feasibility of using reclaimed water in place of seawater for once-through cooling of the steam turbine. Use of reclaimed water would eliminate the aquatic biological impacts caused by use of seawater for cooling. The conclusion of the study is that use of reclaimed water for once-through cooling is both technically and economically feasible.

VISUAL RESOURCES

Potential project impacts of the ESPR have been evaluated against the baseline of strong existing visual impacts of the ESGS. Therefore, no significant visual impacts were identified under CEQA. However, staff does not regard either the existing ESGS or unmitigated ESPR as visually compatible with their scenic coastal setting as viewed from high sensitivity foreground viewpoints on Vista del Mar and Dockweiler and Manhattan State Beaches.

The California Coastal Commission has found that the project as proposed is not consistent with provisions of the Coastal Act. Because the Coastal Commission found the project setting to be "visually degraded," the Coastal Commission recommended specific provisions be implemented to restore and enhance the project site pursuant to Section 30251 of the Coastal Act. The Energy Commission must include in its decision the provisions recommended by the Coastal Commission unless the Energy Commission determines that adoption of these provisions would result in a greater adverse effect on the environment or that the provisions would not be feasible for the project. Staff has incorporated the Coastal Commission's recommendations as proposed Condition of Certification **VIS-1**. The Coastal Commission stated that with

implementation of these specific provisions, the visual aspects of the proposed facility would be consistent with the policies of the Coastal Act.

The staffs of the Energy Commission and Coastal Commission agree that the applicant's current visual mitigation proposal is not sufficient to meet the requirements of the Coastal Commission's specific provisions. Staff believes that the nature of the screening of this project (e.g. architectural v. landscaping), given the project's location, is something that should be resolved as early as possible. Although the Coastal Commission's specific provisions allow for resolution of such issues after certification (though prior to construction), the approval of required plans is left to the Energy Commission and not staff. Therefore, Energy Commission staff recommends that, if at all possible, the visual enhancement plans be developed in time for review and approval by the Energy Commission as part of the certification process. If these plans are not approved as part of the certification decision, adoption and implementation of the proposed conditions of certification will ensure conformance with the Coastal Act. If the Energy Commission certifies the project, staff recommends adoption and implementation of all of the proposed Conditions of Certification in order to ensure that the project is built and operated consistent with all LORS and that the project will not result in any significant impacts.

ENVIRONMENTAL JUSTICE

The purpose of an environmental justice screening analysis is to determine whether there exists a minority and/or low-income population within the potential affected area of the proposed project. Energy Commission staff has determined the potential affected area is within a six-mile radius of the proposed ESPR site. The six-mile radius is consistent with the radius used for staff's cumulative air quality analysis. This environmental justice analysis consists of identification of significant impacts (if any), identification of mitigation, and determination of whether there is a disproportionate impact if an unmitigated significant impact has been identified.

The demographic data show that the minority population consisting of people of color within the six-mile radius is 60.6 percent. This population is predominantly located about three miles east and inland in the cities of Inglewood, Gardena, Hawthorne, Culver City, and Torrance. Comparing the six-mile radius population of 60.6 percent to Los Angeles County, which has a total people of color population of 69.0 percent indicates that the minority population in the six-mile radius is lower than the county as a whole. Staff believes that the El Segundo Power Redevelopment Project would not cause a disproportionate significant adverse direct or cumulative impact to minority and/or low-income populations.

CONCLUSIONS AND RECOMMENDATIONS

Staff cannot recommend certification of the ESPR project at this time due to unmitigated impacts to air quality and marine biological resources. In addition, the Coastal Commission has found that the project is not consistent with Coastal Act provisions regarding the protection of marine resources and visual resources. Staff has recommended additional measures that could provide adequate mitigation for air quality

and visual resource impacts, but ESP II has not currently agreed to implement these measures.

With regard to biological resources, staff recommends that the Energy Commission license the project only with mitigation that avoids or significantly reduces the adverse biological impacts from the use of water from Santa Monica Bay for once-through cooling. Because ESP II has failed to supply the sound scientific information on entrainment impacts that would be needed to develop appropriate mitigation, staff cannot recommend approval of the project as proposed at this time. Until a scientifically valid study of ESGS impingement and entrainment effects is completed, staff cannot recommend specific mitigation measures for this project, other than to abandon the use of water from Santa Monica Bay for once-through cooling altogether. This would reduce the impacts to less than significant levels.

Staff recommends that the applicant consider amending the proposed project to use reclaimed water in the once-through cooling system, or other alternative cooling option, that would eliminate the use of sea water for once through cooling. While such an amendment would require additional analyses of potential impacts associated with an alternative, it would avoid entirely both the significant environmental impacts of the project as proposed and the delays necessary to complete the additional studies on entrainment and impingement impacts needed to develop appropriate mitigation. If the applicant does not change the proposed cooling system, staff recommends that the project not be certified until adequate site-specific biological studies are completed which allow development of appropriate mitigation measures.

Staff has recommended including the Coastal Commission's specific provisions relating to visual resources as a Condition of Certification. These provisions would require the finalization of visual mitigation plans prior to the start of construction following review by the Executive Director of the Coastal Commission and approval by the Energy Commission. While the Coastal Commission found that approval of the final plans by the Energy Commission following certification would be adequate for the project to be consistent with Coastal Act provisions, staff believes that the appropriate time for these plans to be finalized is during the certification process, and encourages ESP II to provide the plans in sufficient detail prior to or during the evidentiary hearing process, so that Coastal Commission review and Energy Commission approval could be accomplished prior to certification.

**EL SEGUNDO POWER II LLC (00 AFC 14)
FINAL STAFF ASSESSMENT**

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INTRODUCTION

James W. Reede, Jr.

PURPOSE OF THIS REPORT

On December 21, 2000, EL Segundo Power II LLC (ESP II) filed an Application for Certification (AFC) seeking approval from the California Energy Commission to replace the existing El Segundo Generating Station (ESGS) Units 1 and 2 in the City of El Segundo with a 630 megawatt (MW) natural gas-fired, combined cycle electric generation facility. On February 7, 2001, the California Energy Commission found the AFC to be Data Adequate. The finding of data adequacy by the Commission began staff's analysis of the project.

This Final Staff Assessment (FSA) is the Energy Commission staff's independent analysis of the El Segundo Power Redevelopment Project (ESPR) AFC. The FSA is a staff document. It is neither a Committee document, nor a draft decision or proposed decision. The FSA describes the following:

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

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

The Energy Commission staff's analyses were prepared in accordance with Public Resources Code section 25500 et seq., Title 20, California Code of Regulation section 1701 et seq., and the California Environmental Quality Act (CEQA) (Pub. Resources Code, § 15000 et seq.).

ORGANIZATION OF THE FINAL STAFF ASSESSMENT

This **INTRODUCTION** section explains the purpose of the FSA and its relationship to the Energy Commission's siting process. The **PROJECT DESCRIPTION** section provides a brief overview of the project including its purpose, location and major project components.

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

ENERGY COMMISSION SITING PROCESS

The California Energy Commission has the exclusive authority to certify the construction, modification and operation of thermal electric power plants 50 megawatts (MW) or larger. The Energy Commission certification is in lieu of any permit required by state, regional, or local agencies, and federal agencies to the extent permitted by federal law (Pub. Resources Code, §25500). The Energy Commission must review power plant AFCs to assess potential environmental impacts including potential impacts to public health and safety, potential measures to mitigate those impacts (Pub. Resources Code, §25519), and compliance with applicable governmental laws.

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

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

Staff conducts its environmental analysis in accordance with the requirements of the California Environmental Quality Act. No Environmental Impact Report (EIR) is required because the Energy Commission's site certification program has been certified by the

Resources Agency (Pub. Resources Code, § 21080.5 and Cal. Code Regs., tit. 14, § 15251 (k)).

The staff prepares a Staff Assessment (SA) and presents for the applicant, intervenors, agencies, other interested parties and members of the public, the staff's analysis, conclusions, and recommendations. Where staff believes it is appropriate, the Final Staff Assessment incorporates comments received from agencies, the public and parties to the siting case, and comments made at the workshops. The FSA serves as staff's written testimony.

Staff will provide a comment period to resolve issues between the parties and to narrow the scope of adjudicated issues in the evidentiary hearings. During the period after the publishing the FSA, staff will conduct one or more workshops to discuss its findings, proposed mitigation, and proposed compliance-monitoring requirements. Based on the workshops and written comments, staff may refine its analysis, correct errors, and finalize conditions of certification to reflect areas where agreements have been reached with the parties. Staff will provide any revisions in supplemental testimony.

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

Following the hearings, the Committee's recommendation to the full Energy Commission on whether or not to approve the proposed project will be contained in a document entitled the Presiding Member's Proposed Decision (PMPD). Following publication, the PMPD is circulated in order to receive written public comments. At the conclusion of the comment period, the Committee may prepare a revised PMPD. A revised PMPD shall be circulated for a 15-day comment period. At the close of the comment period for the revised PMPD, the PMPD is submitted to the full Energy Commission for a decision. Within 30 days of the Energy Commission decision, any party may appeal the decision to the Energy Commission.

A **COMPLIANCE MONITORING PLAN AND GENERAL CONDITIONS** will be assembled from conditions contained in the FSA and other evidence presented at the hearings. The Compliance Monitoring Plan and General Conditions will be presented in the PMPD. The Energy Commission staff's implementation of the plan ensures that a certified facility is constructed, operated, and closed in compliance with the conditions adopted by the Energy Commission. The proposed **COMPLIANCE MONITORING PLAN AND GENERAL CONDITIONS** are included at the end of the FSA.

PUBLIC AND AGENCY COORDINATION

The El Segundo Power Redevelopment Project is proposed on land currently zoned for a power plant. Publicly noticed workshops on air quality, water resources, biological resources, cultural resources, noise, visual resources, traffic and transportation and other issues have been held in El Segundo. These workshops have been highly productive.

In addition to these workshops, extensive coordination has occurred with the numerous local, state and federal agencies that have an interest in the project. Energy Commission staff has worked with the Cities of El Segundo, Manhattan Beach, the City of Los Angeles, Los Angeles County, the California Independent System Operator (Cal-ISO), the South Coast Air Quality Management District, the California Air Resources Board, the Federal Aviation Administration, the U.S. Environmental Protection Agency, the California Coastal Commission, U.S. Fish and Wildlife Service, National Marine Fisheries Service, California Departments of Fish & Game, Health Services, and Parks & Recreation, U.S. Army Corp of Engineers, and the Los Angeles Regional Water Quality Control Board to identify and resolve issues of concern. In addition, Commission staff has coordinated the review and analysis of the project with intervenors and interested residents of the community.

PROJECT DESCRIPTION

Testimony of James W. Reede, Jr.

NATURE AND PURPOSE OF THE PROJECT

On December 21, 2000, EL Segundo Power II LLC (ESP II) filed an Application for Certification (AFC) seeking approval from the California Energy Commission to construct and operate the El Segundo Power Redevelopment (ESPR) project. The ESPR is a proposed 630 megawatt (MW) natural gas-fired, combined cycle electric generation facility that would replace the existing El Segundo Generating Station (ESGS) Units 1 and 2.

PROJECT LOCATION

The applicant proposes to modify an existing power plant in El Segundo, California, an incorporated city in Los Angeles County. This facility consists of 3 contiguous parcels approximately 34 acres in size. The site is bordered by Vista Del Mar Boulevard and the Chevron Refinery on the east, Santa Monica Bay on the west, 45th Street of the City of Manhattan Beach on the south, and the Chevron Marine terminal on the north. The facility is located at Township 3 South, Range 15 West, of the Venice USGS Quadrangle Map. See **Project Description Figure 1**.

POWER PLANT

The new combined cycle facility is expected to have a net output of 630 megawatts (MW) under nominal conditions. This is 280 MW more than the old Units 1 and 2 were capable of generating when operating. The project includes demolition and removal of the existing Units 1 and 2 and their replacement with Units 5, 6, and 7 in the footprint of Units 1 and 2. The steam cycle heat rejection system, which currently utilizes cooling water from Santa Monica Bay, will remain and is proposed to be used for the new equipment. The existing ESGS Units 3 and 4 located adjacent to Units 1 and 2, will not be modified by this project however they will be re-rated from 604 MW to 670 MW.

Units 5 and 7 will be General Electric PG7241FA combustion turbine generators. These natural gas fired generators will each have a base load gross output of 171.7 MW. The gross output will be increased to 183.4 MW for peak loads by using steam injection. The combined cycle configuration will be accomplished with the addition a Heat Recovery Steam Generator (HRSG) to the exhaust outlets of both Units 5 and 7. The addition of a General Electric Steam Turbine Generator (STG) will complete the combined cycle configuration. The STG will have a peak generating output of 280 MW.

The project will use Selective Catalytic Reduction (SCR), a dry, low NO_x combustor, and an oxidation catalyst system to reduce air emissions. An ammonia pipeline will be installed from the adjacent Chevron marine terminal property to deliver aqueous ammonia to the site for SCR eliminating the need for truck deliveries of ammonia. The project will continue to store the aqueous ammonia in an existing on-site 20,000-gallon

double walled underground storage tank with leak detectors, pressure relief valves, and gauges for temperature and pressure.

An aerial view of the plant layout **Project Description Figure 2** shows the existing power plant site and electrical substation. **Project Description Figure 3** provides a view of how the plant will look on the site. **Project Description Figure 4** shows elevations of the power plant facilities.

TRANSMISSION LINE FACILITIES

No new transmission lines are required for the project. Three new generator step-up transformers will be installed and connected to the existing 230 kV switchyard. The connections to the switchyards will be made via aboveground lead lines and two new steel support poles.

WATER SUPPLY AND WASTE WATER TREATMENT

Water requirements for the project are estimated at 207 million gallons per day at full operation and will be supplied from a combination of sources. The applicant proposes to use the existing seawater cooling system for the new units without modifying the intake or outfall structures and lines.

The City of El Segundo, through purchases from the Metropolitan Water District, will supply potable water. The plant will use approximately 180,000 gallons per day of potable water.

The West Basin Municipal Water District will supply approximately 86,000 gallons of reclaimed water per day for both irrigation and for pumps and bearings seal water augmentation.

Sanitary wastewater discharge will be into the City of Manhattan Beach Sanitary Sewer System via a new 3-inch water pipeline hookup on the 45th Street side of the plant.

CONSTRUCTION AND OPERATION

Two existing fuel storage tanks, previously used by Southern California Edison, are proposed for demolition as part of the project. The area presently occupied by the tanks is proposed for construction laydown. The applicant has proposed using the tanks as domed storage facilities during construction to reduce dust and to mitigate noise due to construction activities. The storage tank area will require soil contaminant remediation prior to use. The tanks will be removed in stages after the completion of the project and the area will be converted to a parking lot and laydown area. The landscaping and tank farm plans for this area are included in the applicant's Project Description Amendment (ESPR 2002aa). Construction laydown and off-site parking have additionally been proposed for both the Kramer and FedEx sites and various beach parking lots.

The project will require a construction workforce of approximately 422 craftspersons over the proposed 20-month construction period. The construction period will begin

immediately after a four to six month site preparation phase that will include demolition of units 1 and 2 and the conversion of the fuel storage tanks. Operation of the completed project will require a minimum of 53 skilled workers which is a net gain of two workers.

REFERENCES

ESPR (El Segundo Power Station) 2000a - Application for Certification. Submitted to the California Energy Commission on December 18, 2000.

ESPR (Livingston & Mattesich/John McKinsey) 2002aa. Project Description Amendment – POS. Submitted to the California Energy Commission on June 17, 2002.

INSERT FIGURE 1 THIS PAGE

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AIR QUALITY

Supplemental Testimony of Joseph M. Loyer

INTRODUCTION

This analysis evaluates the expected air quality impacts of the emissions of criteria air pollutants due to the planned construction and operation of the El Segundo Power Redevelopment Project (ESPR) as proposed by the El Segundo Power II LLC (ESPII). Criteria air pollutants are defined as those for which a state or federal ambient air quality standard has been established to protect public health. They include nitrogen dioxide (NO₂), sulfur dioxide (SO₂), carbon monoxide (CO), ozone (O₃), volatile organic compounds (VOC) and particulate matter less than 10 microns in diameter (PM₁₀).

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

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

LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)

FEDERAL

Under the Federal Clean Air Act (40 CFR 52.21), there are two major components of air pollution law, New Source Review (NSR) and Prevention of Significant Deterioration (PSD). NSR is a regulatory process for evaluation of those pollutants that violate federal ambient air quality standards. Conversely, PSD is a regulatory process for evaluation of those pollutants that do not violate federal ambient air quality standards. The NSR analysis has been delegated by the Environmental Protection Agency (EPA) to the South Coast Air Quality Management District (District). The District determines the conformance with the PSD regulations. The PSD requirements apply only to those projects (known as major sources) that exceed 100 tons per year for any pollutant.

STATE

The California State Health and Safety Code, section 41700, requires that “no person shall discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or which endanger the comfort, repose, health, or

safety of any such persons or the public, or which cause, or have a natural tendency to cause, injury or damage to business or property.”

LOCAL - SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

The proposed project is subject to the following South Coast Air Quality Management District rules and regulations:

Regulation II – Permits

This regulation sets forth the regulatory framework of the application for and issuance of construction and operation permits for new, altered and existing equipment.

Rule 202 – Temporary Permit to Operate

This rule states that any new equipment that has been issued a Permit to Construct (PTC) shall be allowed to use that PTC as a temporary Permit to Operate (PTO) upon notification to the Air Pollution Control Officer (APCO).

Rule 203 – Permit to Operate

This rule prohibits the use of any equipment that may emit air contaminants or control the emission of air contaminants, without first obtaining a PTO except as provided in Rule 202.

Rule 217 – Provisions for Sampling and Testing

The Executive Officer (EO) may require the applicant to provide and maintain facilities necessary for sampling and testing. The EO will inform the applicant of the need for testing ports, platforms and utilities.

Rule 218 – Continuous Emission Monitoring

This rule describes the installation, QA/QC and reporting requirements for all sampling interfaces, analyzers and data acquisition systems used to continuously determine the concentration or mass emission of an emission source. However, this rule does not apply to the CEMS required for NO_x monitoring under the Regional Clean Air Incentives Market (RECLAIM) (Regulation XX).

Regulation IV – Prohibitions

This regulation sets forth the restrictions for visible emissions, odor nuisance, fugitive dust, various air emissions, fuel contaminants, start-up/shutdown exemptions and breakdown events.

Rule 401 – Visible Emissions

Generally this rule restricts visible emissions from a single source for more than three minutes in any one hour from being as dark or darker than that designated on the No. 1 Ringelman Chart (US Bureau of Mines).

Rule 402 – Nuisance

This rule restricts the discharge of any contaminant in quantities that cause or have a natural ability to cause injury, damage, nuisance or annoyance to businesses, property or the public.

Rule 403 – Fugitive Dust

This rule requires that the applicant prevent, reduce or mitigate fugitive dust emissions from the project site. Rule 403 restricts visible fugitive dust to the project property line, restricts the net PM₁₀ emissions (between up and down wind measurements) to less than 50 ug/m³ and restricts the tracking out of bulk materials onto public roads. Additionally, the applicant must utilize one or more of the best available control measures (identified in the tables within the rule). Mitigation measures may include adding freeboard to haul vehicles, covering loose material on haul vehicles, watering, using chemical stabilizers and/or ceasing all activities. Finally, a contingency plan maybe required if so determined by the US EPA.

Rule 407 – Liquid and Gaseous Air Contaminants

This rule limits CO emissions to 2,000 ppm and SO₂ emissions to 500 ppm, averaged over 15 minutes. However, internal combustion engines are exempt from the SO₂ limit, as is equipment that complies with rule 431.1. The applicant will comply with rule 431.1 and thus the sulfur limit of rule 407 will not apply.

Rule 408 – Circumvention

This rule prohibits the use of equipment that conceals emissions without reducing emissions, except in cases where the only violation involved is of Section 48700 of the Health and Safety Code or District Rule 402.

Rule 409 – Combustion Contaminants

This rule restricts the discharge of contaminants from the combustion of fuel to 0.23 grams per cubic meter of gas, calculated to 12% CO₂, averaged over 15 minutes. This rule does not apply to IC engines or jet engine test stands.

Rule 431.1 – Sulfur Content of Gaseous Fuels

This rule restricts the sale or use of gaseous fuels that exceed a sulfur content limit. The sulfur content limit for natural gas is 16 ppmv calculated as H₂S. This rule also establishes monitoring and reporting requirements, as well as test methods to be used.

Rule 431.2 – Sulfur Content of Liquid Fuels

This rule establishes a sulfur content limit for diesel fuel of 0.05% by weight, as well as record keeping requirements and test methods.

Rule 475 – Electric Power Generating Equipment

This rule limits combustion contaminants (PM₁₀) from electric power generating equipment to 11 pounds per hour and 23 milligrams per cubic meter @ 3% O₂ (averaging time subject to Executive Officer decision).

Regulation VII – Emergencies

Rule 701 – Air Pollution Emergency Contingency Actions

This rule requires that facilities employing 100 or more people or emitting 100 or more tons of pollutants (NO_x, SO_x or VOC) per year, upon declaration or prediction of a Stage 2 or 3 smog episode, reduce NO_x, SO_x and VOC emissions by at least 20% of normal workday operations. This rule also requires that upon declaration of a state of emergency by the Governor, that the facility comply with the Governor's requirements. A power plant facility may be exempt from Rule 701 if they are determined to be an essential service responding to a public emergency or utility outage.

Regulation IX – Standards of Performance for New Stationary Sources

Regulation IX incorporates provisions of Part 60, Chapter I, Title 40, of the Code of Federal Regulations (CFR) and is applicable to all new, modified or reconstructed sources of air pollution. Sections of this regulation apply to electric utility steam generators (Subpart Da) and stationary gas turbines (Subpart GG). These subparts establish limits of particulate matter, SO₂ and NO₂ emissions from the facility as well as monitoring and test method requirements.

Regulation XI – Source Specific Standards

Rule 1110.1 – Emissions from Stationary Internal Combustion Engines

This rule generally applies to engines larger than 50 brake horsepower (bhp) and places restriction on rich-burn or lean-burn engines. These restrictions are in the form of NO_x and CO emission limits and the required submittal of a control plan to demonstrate compliance. Emergency standby engines, operating less than 200 hours per year are exempt from Rule 1110.1.

Rule 1110.2 – Emissions from Gas and Liquid Fueled Engines

This rule establishes NO_x, VOC and CO emissions limits for stationary and portable engines over 50 bhp in rated capacity. Emergency standby engines, operating less than 200 hours per year are exempt from Rule 1110.2.

Regulation XIII – New Source Review

This regulation sets forth the pre-construction review requirements for new, modified or relocated facilities to ensure that these facilities do not interfere with progress in attainment of the national ambient air quality standards and that future economic growth in the SCAQMD is not unnecessarily restricted. This regulation limits the emissions of non-attainment contaminants and their precursors as well as ozone depleting compounds (ODC) and ammonia by requiring the use of Best Available Control Technologies (BACT). However, this regulation does not apply to NO_x or SO_x emissions from certain sources, which are regulated by Regulation XX (RECLAIM). This regulation applies to SO_x emissions from the ESPR, but not to the NO_x emissions from the project.

Rule 1303 – Requirements

This rule specifies the application of BACT, modeling, offsetting and offset ratios to permitted sources within the SCAQMD.

Rule 1304 – Exemptions

This rule identifies the conditions under which a facility may be exempt from the application of Rule 1303. Section (a) 2 specifically exempts utility steam boiler replacements with other advanced gas turbines (or other specified technologies). The only proviso being that the new technology is compliant with Rule 1135 (if applicable) or Regulation XX rules (see RECLAIM below) and that the new technology not increase the overall capacity at the facility. If there is a capacity increase the owners are responsible for mitigating the emissions associated with that increased capacity.

Rule 1306 – Emission Calculations

This rule defines the applicability of rules 1301 (b) and 1303 as exempted by rule 1304. This rule explains how emission increases or decreases are valued how many offsets are required and how emission reduction credits is valued.

Rule 1309.1 – Priority Reserve

This rule establishes a reserve of emission reduction credits exclusively for the use of priority sources. Priority sources are defined as Innovative Technologies, Research Operations, Essential Public Services and qualifying Electric Generating Facilities. Qualifying Electric Generating Facilities are required to pay a fee of \$25,000 per lbs/day of PM10, \$8,900 per lbs/day of SOx and \$12,000 per lbs/day of CO. To qualify, an Electric Generating Facility must have a completed application with the CEC in the years 2000, 2001, 2002 or 2003. It must meet BARCT rules. It must make a due diligence effort to find ERCs at a cost less than the fee. It must be operational within three years following the issuance of the Permit to Construct. Finally, It must sign a contract with the State of California to sell at least 50% of its generation to the State.

Regulation XVII – Prevention of Significant Deterioration

This regulation sets forth the pre-construction requirement for stationary sources to ensure that the air quality in clean air areas does not significantly deteriorate while maintaining a margin for future industrial growth. This regulation establishes maximum allowable increases over ambient baseline concentrations for each pollutant. The ESPR will trigger PSD review for NOx only.

Regulation XX – Regional Clean Air Incentives Market (RECLAIM)

The Regional Clean Air Incentives Market (RECLAIM) program is designed to allow facilities flexibility in achieving emission reduction requirements for NOx and SOx through controls, equipment modifications, reformulated products, operational changes, shutdowns, other reasonable mitigation measures, or the purchase of excess emission reductions. The RECLAIM program establishes an initial allocation (beginning in 1994) and an ending allocation (to be attained by the year 2003) for each facility within the program (Rule 2002). Each facility then reduces their allocation annually on a straight line from the initial to the ending. The RECLAIM program supercedes other specified district rules where there are conflicts. As a result, the RECLAIM program has its own

rules for permitting, reporting, monitoring (including CEM), record keeping, variances, breakdowns and the New Source Review program, which incorporates BACT requirements (Rules 2004, 2005, 2006 and 2012). RECLAIM also has its own banking rule, RECLAIM Trading Credits (RTCs), which is established in Rule 2007. The ESPR is exempt from the SO_x RECLAIM program (Rule 2011) because it uses natural gas exclusively (per Rule 2001). However, it will be a NO_x RECLAIM project and therefore subject to the rules of RECLAIM for NO_x emissions.

Regulation XXX – Title V Permits

The Title V federal program is the air pollution control permit system required by the federal Clean Air Act as amended in 1990. Regulation XXX defines the permit application and issuance as well as compliance requirements associated with the program. Any new or modified major source which qualifies as a Title V facility must obtain a Title V permit prior to construction, operation or modification of that source. Regulation XXX also integrates the Title V permit with the RECLAIM program such that a project cannot proceed without complying with both regulations.

Regulation XXXI – Acid Rain Permits

Title IV of the federal Clean Air Act provides for the issuance of acid rain permits for qualifying facilities. Regulation XXXI integrates the Title IV program with the RECLAIM program. Regulation XXXI requires a subject facility to obtain emission allowances for SO_x emissions as well as monitoring SO_x, NO_x and CO₂ emissions from the facility.

ENVIRONMENTAL SETTING

METEOROLOGICAL CONDITIONS

The general climate of California is typically dominated by the eastern Pacific high-pressure system centered off the coast of California. In the summer, this system results in low inversion layers with clear skies inland and typically early morning fog by the coast. In winter, this system promotes wind and rainstorms originating in the Gulf of Alaska and striking Northern California.

The large-scale wind flow pattern in the South Coast basin is a diurnal cycle driven by the differences in temperature between the land and the ocean as well as the mountainous terrain surrounding the basin. The Tehachapi and Temblor Mountains separate the South Coast and San Joaquin Valley air basins. The San Bernardino, San Gabriel and Santa Rosa Mountains generally make up the eastern mountain range of the South Coast air basin. The Santa Monica and Santa Ana Mountains make up the northern and southern (respectively) coastal mountain ranges of the South Coast air basin.

The project is located in the coastal region of the South Coast basin, in the City of El Segundo of Los Angeles County, approximately 2.5 miles southwest of the Los Angeles Airport (LAX). The site elevation is approximately 15 feet above sea level and the site is located directly on the coast, bordered by the Pacific Ocean, the coastline and a portion of urban Los Angeles. The coastline runs north-northwest to south-southeast along the project boundary. Small bluffs (approximately 100 feet high) run north to south just east

of the project boundary, with elevated terrain a significant distance from the project site (approximately 6 miles). Temperatures recorded at LAX range from 27 °F to 110 °F with an average humidity of 72%. The South Coast basin receives most of its rainfall between November and April. LAX recorded an annual average of 12 inches.

The wind patterns near the project site are predominately from the west or northwest (approximately 30%). Calm conditions prevail from 10% to approximately 16% of the time. The mixing heights recorded at LAX in the morning range from 335 meters (1,100 feet) to greater than 1,000 meters (3,050 feet). The mixing heights recorded at LAX in the afternoon range from 510 meters (1,670 feet) to 1,200 meters (3,940 feet).

EXISTING AIR QUALITY

The Federal Clean Air Act and the California Air Resources Board (CARB) both required the establishment of allowable maximum ambient concentrations of air pollutants, called ambient air quality standards (AAQS). The state AAQS, established by CARB, are typically lower (more protective) than the federal AAQS, which are established by the EPA. The state and federal air quality standards are listed in AIR QUALITY Table 1. As indicated in AIR QUALITY Table 1, the averaging times for the various air quality standards (the duration over which they are measured) range from one-hour to an annual average. The standards are read as a concentration, in parts per million (ppm), or as a weighted mass of material per a volume of air, in milligrams or micrograms of pollutant in a cubic meter of air (mg/m^3 and $\mu\text{g}/\text{m}^3$).

In general, an area is designated as attainment for a specific pollutant if the concentrations of that air contaminant do not exceed the standard. Likewise, an area is designated as non-attainment for an air contaminant if that standard is violated. Where not enough ambient data are available to support designation as either attainment or non-attainment, the area can be designated as unclassified.

Unclassified areas are normally treated the same as attainment areas for regulatory purposes. An area can be attainment for one air contaminant while non-attainment for another, or attainment for the federal standard and non-attainment for the state standard for the same contaminant. The entire area within the boundaries of a district is usually evaluated to determine the district's attainment status.

**AIR QUALITY Table 1
Federal and State Ambient Air Quality Standards**

Pollutant	Averaging Time	Federal Standard	California Standard
Ozone (O ₃)	1 Hour	0.12 ppm (235 µg/m ³)	0.09 ppm (180 µg/m ³)
Carbon Monoxide (CO)	8 Hour	9 ppm (10 mg/m ³)	9 ppm (10 mg/m ³)
	1 Hour	35 ppm (40 mg/m ³)	20 ppm (23 mg/m ³)
Nitrogen Dioxide (NO ₂)	Annual Average	0.053 ppm (100 µg/m ³)	---
	1 Hour	---	0.25 ppm (470 µg/m ³)
Sulfur Dioxide (SO ₂)	Annual Average	80 µg/m ³ (0.03 ppm)	---
	24 Hour	365 µg/m ³ (0.14 ppm)	0.04 ppm (105 µg/m ³)
	3 Hour	1300 µg/m ³ (0.5 ppm)	---
	1 Hour	---	0.25 ppm (655 µg/m ³)
Respirable Particulate Matter (PM ₁₀)	Annual Geometric Mean	---	30 µg/m ³
	24 Hour	150 µg/m ³	50 µg/m ³
	Annual Arithmetic Mean	50 µg/m ³	---
Sulfates (SO ₄)	24 Hour	---	25 µg/m ³
Lead	30 Day Average	---	1.5 µg/m ³
	Calendar Quarter	1.5 µg/m ³	---
Hydrogen Sulfide (H ₂ S)	1 Hour	---	0.03 ppm (42 µg/m ³)
Vinyl Chloride (chloroethene)	24 Hour	---	0.010 ppm (26 µg/m ³)
Visibility Reducing Particulates	1 Observation	---	In sufficient amount to produce an extinction coefficient of 0.23 per kilometer due to particles when the relative humidity is less than 70 percent.

The ESPR is located in the City of El Segundo and is under the jurisdiction of the South Coast Air Quality Management District (District). AIR QUALITY Table 2 shows the attainment or non-attainment status of the District for each criteria pollutant for both the federal and state ambient air quality standards. The federal classifications go from moderate to extreme.

**AIR QUALITY Table 2
Attainment ~ Non-Attainment Classification
South Coast Air Quality Management District**

Pollutants	Federal Classification	State Classification
Ozone	Extreme Non-Attainment	Non-Attainment
PM ₁₀	Non-Attainment	Non-Attainment
CO	Serious Non-Attainment	Non-Attainment
NO ₂	Attainment	Attainment
SO ₂	Attainment	Attainment

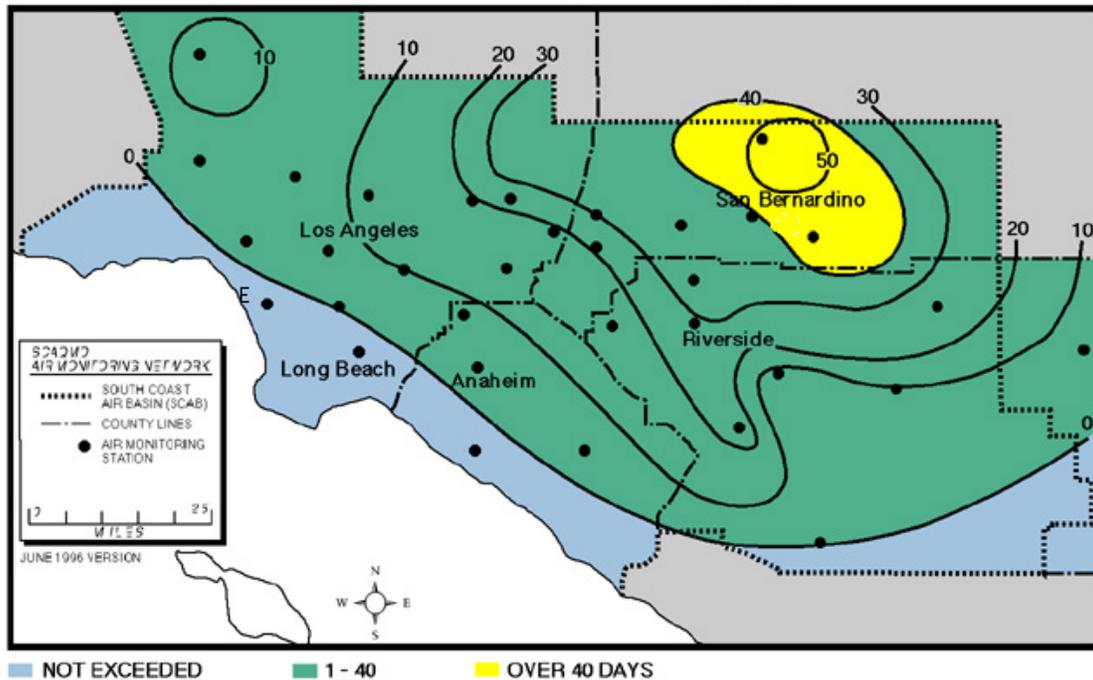
Ozone

Ozone is not directly emitted from stationary or mobile sources, but is formed as the result of chemical reactions in the atmosphere between directly emitted air pollutants. Nitrogen oxides (NO_x) and hydrocarbons (Volatile Organic Compounds [VOCs]) interact in the presence of sunlight to form ozone. The District is designated extreme non-attainment for ozone, meaning that the South Coast air basin ambient ozone design concentration is 0.280 ppm or above and it will take longer than 17 years (from 1990) to reach attainment. Attaining the federal ozone ambient air quality standard is typically planned for by controlling the ozone precursors NO_x and VOC. The 1997 Ozone State Implementation Plan for the South Coast Air Basin (SCAQMD 1999) relies on the California Air Resource Board (CARB) to control mobile sources, the US Environmental Protection Agency (US EPA) to control emission sources under federal jurisdiction and SCAQMD to control local industrial sources. Through these control measures, California and SCAQMD are required to reach attainment of the federal ozone ambient air quality standard by 2010.

Exceedances of the national (and state) ozone ambient air quality standards occur in the Los Angeles area down wind of the project site (see AIR QUALITY Figure 1). In 1998, the South Coast air basin experienced more exceedances of the federal ozone standards than anywhere else in the United States. As AIR QUALITY Figure 1 shows, the highest number of exceedances of the federal ozone standards in 1998 occurred in the Central San Bernardino Mountains. This is also the location of the highest recorded measurement of ozone (0.24 ppm). The approximate location of the project site is indicated in AIR QUALITY Figure 1 with an **E**.

The 1999 statistics show a very similar trend, the Central San Bernardino Mountains lead the South Coast air basin in number of violations and highest ozone measurements. In 1999, there were 30 violations of the national 1-hour ozone standard and 93 violations of the state 1-hour ozone standard with the highest 1-hour measurement of ozone being 0.17 ppm.

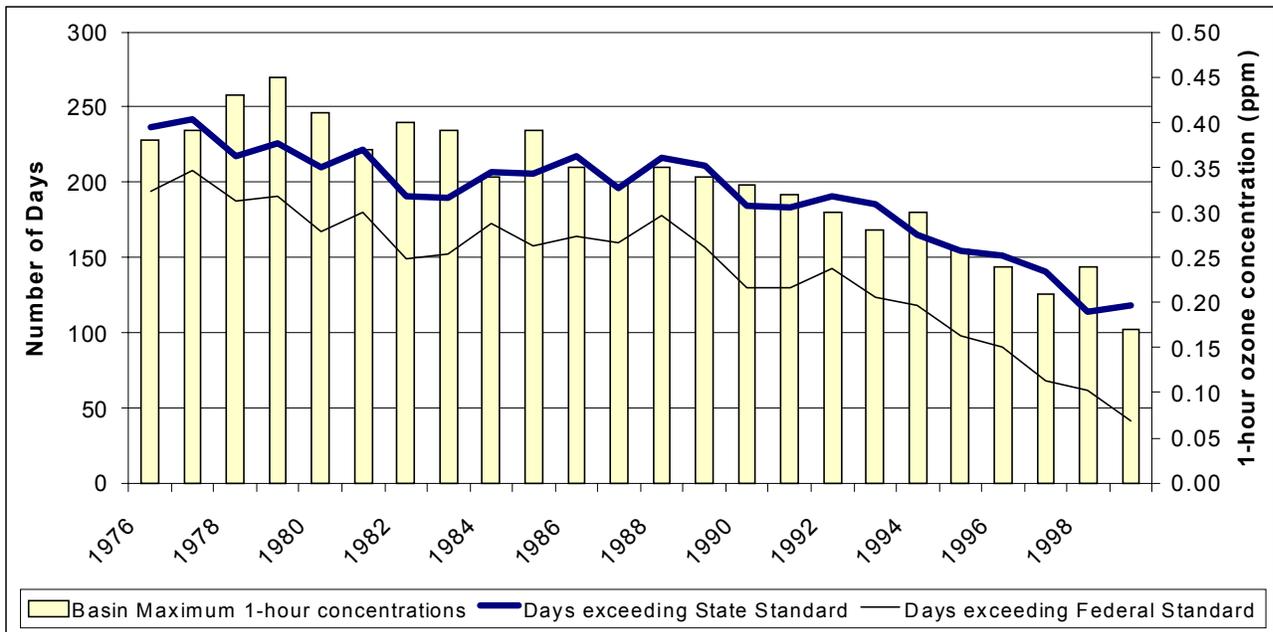
AIR QUALITY Figure 1
OZONE – 1998
Number of Days Exceeding the Federal Standard
(1-hour average > 0.12 ppm)



Source: 1998 Air Quality Standards Compliance Report, South Coast Air Quality Management District

Though there are a significant number of exceedences of the ambient air ozone quality standards, it is important to consider the improvements that have occurred in recent years. The SCAQMD leads the nation in air quality management methods and regulatory programs. These programs have significantly improved the air quality in spite of the growing population and industrial and commercial enterprises. AIR QUALITY Figure 2 shows the improvements in exceedences of the federal and state 1-hour ozone standards and maximum annual ozone concentrations over the past 20 years in the South Coast air basin.

AIR QUALITY Figure 2
Historic Ozone Air Quality Trends of the South Coast Air Basin
1976 to 1999

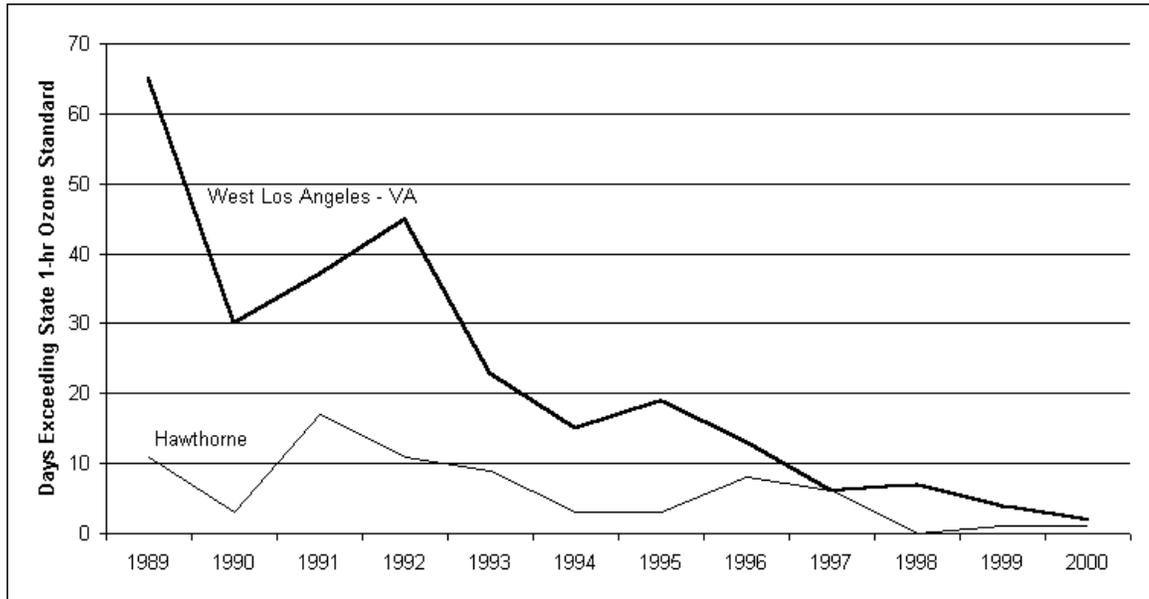


Source: South Coast Air Quality Management District

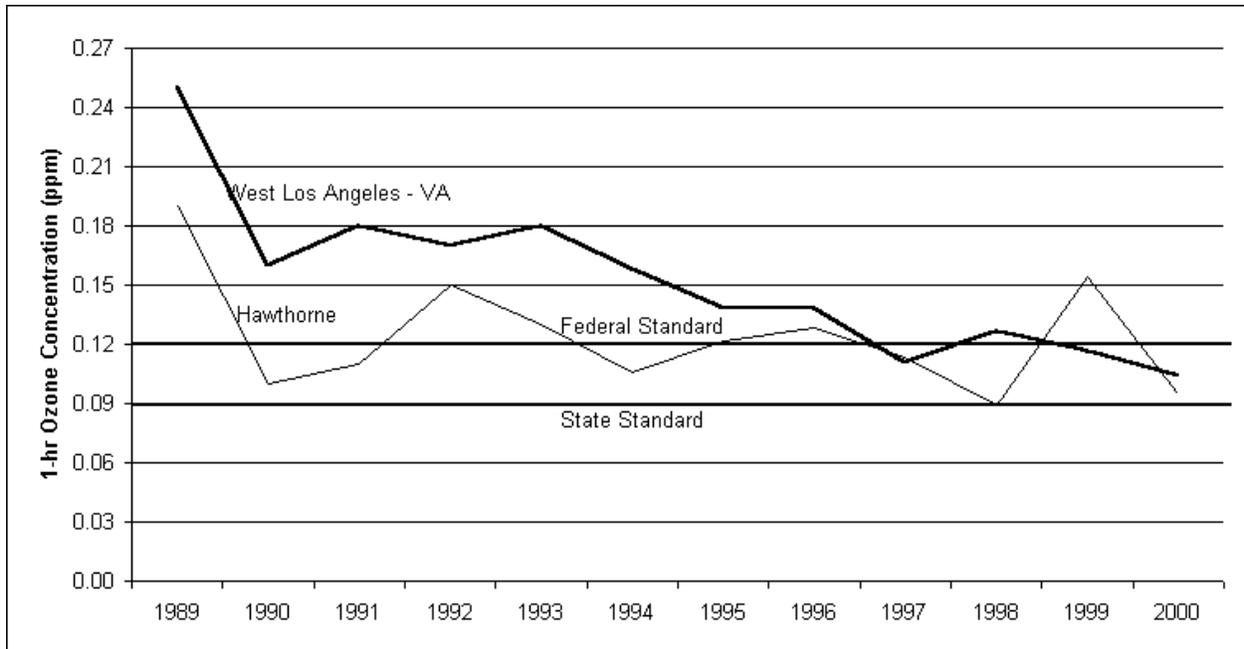
The project site has two air quality monitoring stations nearby, one in West Los Angeles near the Veterans Hospital (7 miles north-northeast of the project site) and the other in the City of Hawthorne (3.5 miles east-southeast of the project site). AIR QUALITY Figure 3 shows the general trends of exceedences of the 1-hour ozone standards near the project site using the monitoring data from these two stations. As can be seen, there is a significant downward trend in the number of days exceeding the state 1-hour ozone standards from 1989 to 2000. AIR QUALITY Figure 4 shows the maximum

annual 1-hour ozone concentrations measured at both monitoring stations from 1989 to 2000. AIR QUALITY Figure 4 demonstrates a downward trend in ozone formation near the project site. Given the overall trends in ozone formation in the South Coast air basin and near the power plant site, staff proposes to use the lowest 1- hour annual-maximum ozone measurements to describe the background air quality conditions. The lowest annual maximum 1-hour ozone concentration was measured at the Hawthorne monitoring station in 1998 at 0.089 ppm.

AIR QUALITY Figure 3
Ozone Trend – Days Exceeding the State 1-hour Standard
1989 to 2000



AIR QUALITY Figure 4
Maximum Measured Annual 1-hour Ozone Concentrations
1989 to 2000



Ozone Transport

The transportation of ozone and ozone precursors (NO_x and VOC) outside of their air district or air basin of origin may cause or contribute to exceedances of the ozone air quality standards in down wind areas. In their most recent report on the contribution of upwind air basins to ozone violations in downwind air basins (CARB 1996), the California Air Resources Board identifies several transport couplings for the South Coast air basin (see AIR QUALITY Table 3). These couplings come in three qualitative varieties, Overwhelming, Significant and Inconsequential. Overwhelming couplings indicate that emissions from the upwind area caused a violation of the state 1-hour ozone standard (0.09 ppm) on at least one day independently of any emission sources within the downwind area. Significant couplings indicate that emissions from the upwind area contribute, but not overwhelmingly, to a violation of the state 1-hour ozone standard. Inconsequential couplings indicate that emissions from the upwind area were not transported or did not contribute significantly to a violation of the state 1-hour ozone standard.

AIR QUALITY Table 3
Transport Couples for the South Coast Air Basin

TRANSPORT COUPLE	Characterization
South Coast to Mojave Desert	O, S
South Coast to San Diego	O,S, I
South Coast to Salton Sea	O, S
South Coast to South Central Coast	S, I
South Central Coast to South Coast	S, I
Southeast Desert (now Mojave and Salton Sea) to South Coast	I
O – Overwhelming S – Significant I – Inconsequential	

In the case of the South Coast air basin, there are several downwind areas. In May 1996, CARB split the Southeast Desert air basin into the Mojave Desert and Salton Sea air basins. CARB determined that the South Coast air basin contributions to violations of the state 1-hour ozone standard in the Mojave Desert air basin were overwhelming on some days and significant on others, with inconsequential contributions occurring less frequently than once per year. CARB also determined that the South Coast air basin contributions to violations of the state 1-hour ozone standard in the Salton Sea air basin were overwhelming on some days and significant on others.

In the November 1996 Triennial Review, CARB re-enforced the 1993 findings that the South Coast air basin contributed to violations of the 1-hour state ozone standard in the San Diego air basin overwhelmingly on some days, significantly on some other days and inconsequentially on other days. However, the number of days where contributions were classified as overwhelming dropped from 20 in 1993 to 5 in 1995. The number of days that were classified as significant increased from 31 to 48 and the number of days that were classified as inconsequential increased from 39 to 43. Since there were significant improvements in ozone measurements within the South Coast air basin

during this time frame (see AIR QUALITY Figure 2), it is reasonable to believe that the improvement in ozone violations within the South Coast air basin and the transport connections outside the basin are related.

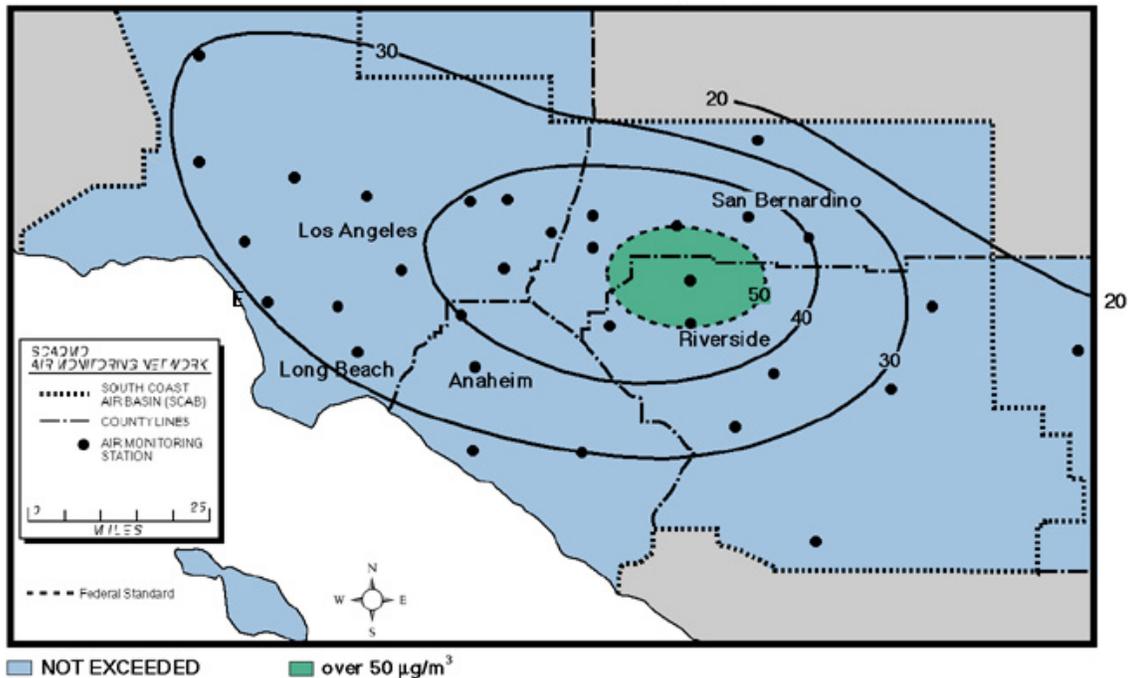
The transportation of ozone and ozone precursors from the South Coast air basin to the South Central Coast air basin is complicated by the existence of other transport couplings to the South Central Coast. The San Joaquin Valley air basin is classified as a significant contributor on some days and insignificant on others. The contributions from the California Coastal Waters (consisting of oil platforms and San Miguel, Santa Rosa and Santa Cruz Islands) are also considered significant on some days. Additionally there is a possibility that ozone transported within the inversion layer was tapped and may have been responsible for some of the ozone violations in the South Central Coast. In the November 1996, Second Triennial Review, CARB concludes that nine 1-hour ozone violations in Santa Barbara County (part of the South Central Coast) from 1994 to 1996 seemed to be related to transport from outside of the county. CARB classifies the South Coast contributions as significant on some days and inconsequential on others. However, CARB further classifies the nine violation days in Santa Barbara County as shared transport days.

For mitigation purposes, CARB requires two things of upwind air basins, a commitment to adopt best available retrofit control technologies for NO_x and VOC emission sources and, for overwhelming transport, the inclusion of measures in the air quality plans to ensure expeditious attainment of the state 1-hour ozone standard in the downwind areas. SCAQMD Rule 1135 is a retrofit rule that applies to all electric power generating systems except those regulated by the RECLAIM program (Regulation XX). The RECLAIM program is considered a retrofit rule because it continually reduces the emission limits of NO_x sources within the SCAQMD authority. The South Coast Air Quality Management Plan addresses attainment of the **federal** 1-hour ozone standard by the year 2010 for the SCAQMD only. However, the South Coast Air Quality Management Plan will have a positive and significant effect on the number and severity of violations of the 1-hour state ozone standard in downwind areas. Therefore, staff finds that the South Coast Air Quality Management Plan is well within the intent of the proposed CARB mitigation for upwind air basins.

Ambient PM10

PM10 is a particulate that is 10 microns in diameter or smaller that is suspended in air. PM10 can be directly emitted from a combustion source (primary PM10 or PM2.5) or soil disturbance (fugitive dust) or it can form downwind (secondary PM10) from some of the constituents of combustion exhaust (NO_x, SO_x and ammonia). San Bernardino (not the entire South Coast air basin) has been designated a non-attainment zone for the **federal** 24-hour and annual PM10 ambient air quality standards. The South Coast air basin (including a portion of the San Bernardino County within the basin) has been designated as a non-attainment zone for the **state** 24-hour and annual PM10 ambient air quality standards (see AIR QUALITY Table 2). AIR QUALITY Figure 6 shows the violations of the federal annual PM10 standard for 1998 in the South Coast air basin. The highest PM10 concentrations are occurring in both San Bernardino and Riverside Counties, as is shown in AIR QUALITY Figure 6. The project location is indicated by an **E** on AIR QUALITY Figure 6.

AIR QUALITY Figure 6
PM10 – 1998
 Annual Arithmetic Mean, $\mu\text{g}/\text{m}^3$
 (Federal Standard = $50 \mu\text{g}/\text{m}^3$)



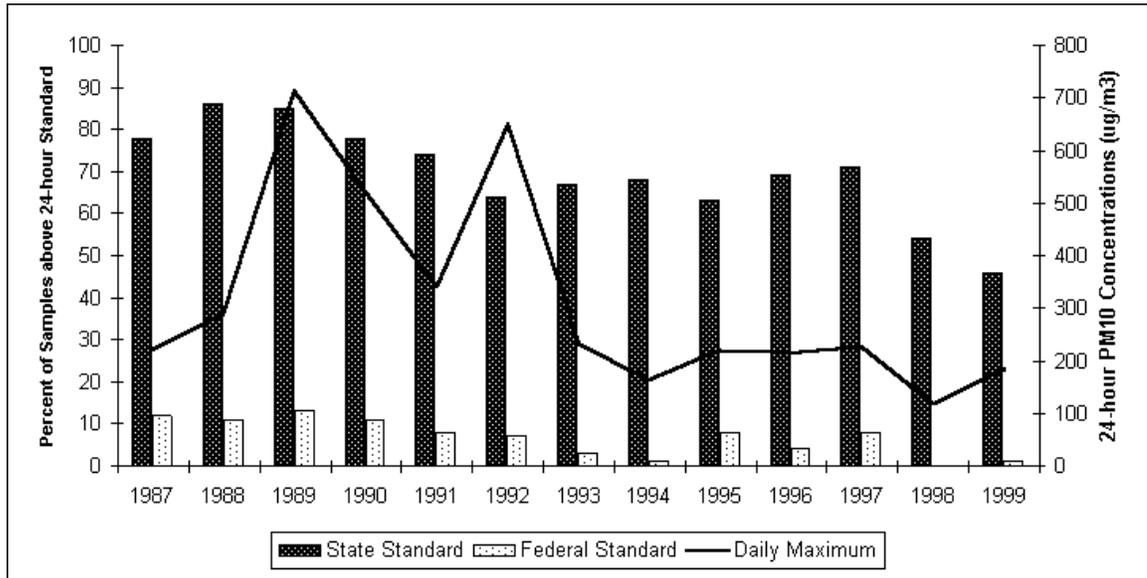
Source: 1998 Air Quality Standards Compliance Report, South Coast Air Quality Management District

AIR QUALITY Figure 7 shows the historic trend of 24-hour PM10 concentrations and the percent of samples (or measurements) that exceed the state and federal ambient air quality standards. As the figure shows, the 24-hour annual maximum measured concentrations have been significantly reduced from 1987 to 1999. Although violations of the state standard are still numerous, violations of the federal standard is coming under control for the South Coast air basin. The annual geometric mean¹ (state annual PM10 standard, $30 \mu\text{g}/\text{m}^3$) and the annual arithmetic mean² (federal annual PM10 standard, $50 \mu\text{g}/\text{m}^3$) are still well over their respective ambient air quality standards, even though they show improvement from 1987 to 1999 (see AIR QUALITY Figure 8).

¹ A geometric mean is the n^{th} root of the product of n measurements.

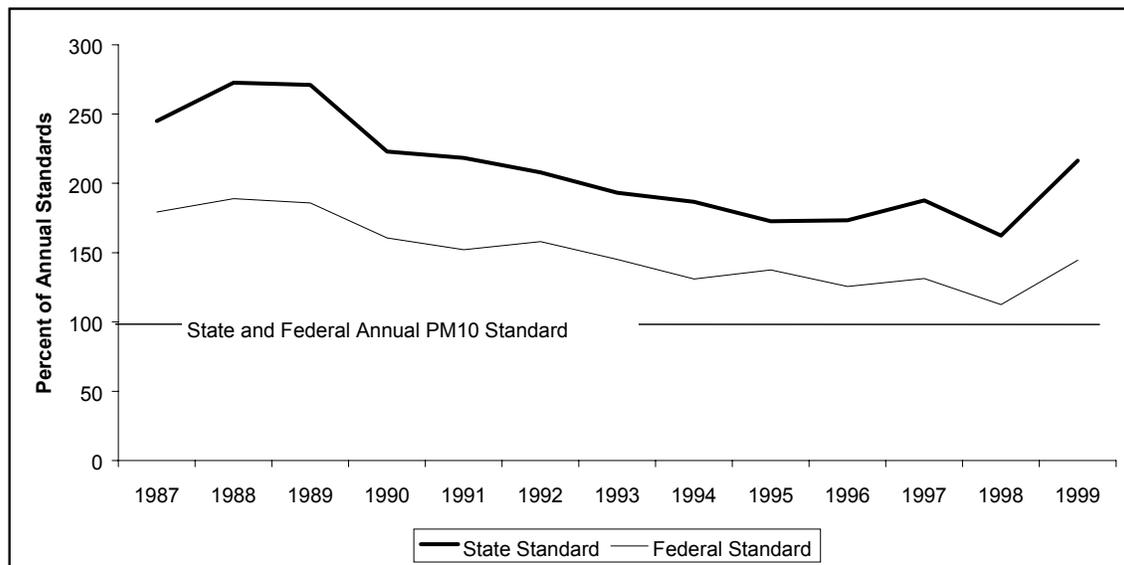
² An arithmetic mean is the sum of n measurements divided by n .

AIR QUALITY Figure 7
Historic 24-hour PM10 Concentrations within the South Coast Air District
1987 to 1999



Source: California Air Resources Board

AIR QUALITY Figure 8
Historic Annual Average PM10 Concentrations in the South Coast Air Basin
1987 to 1999

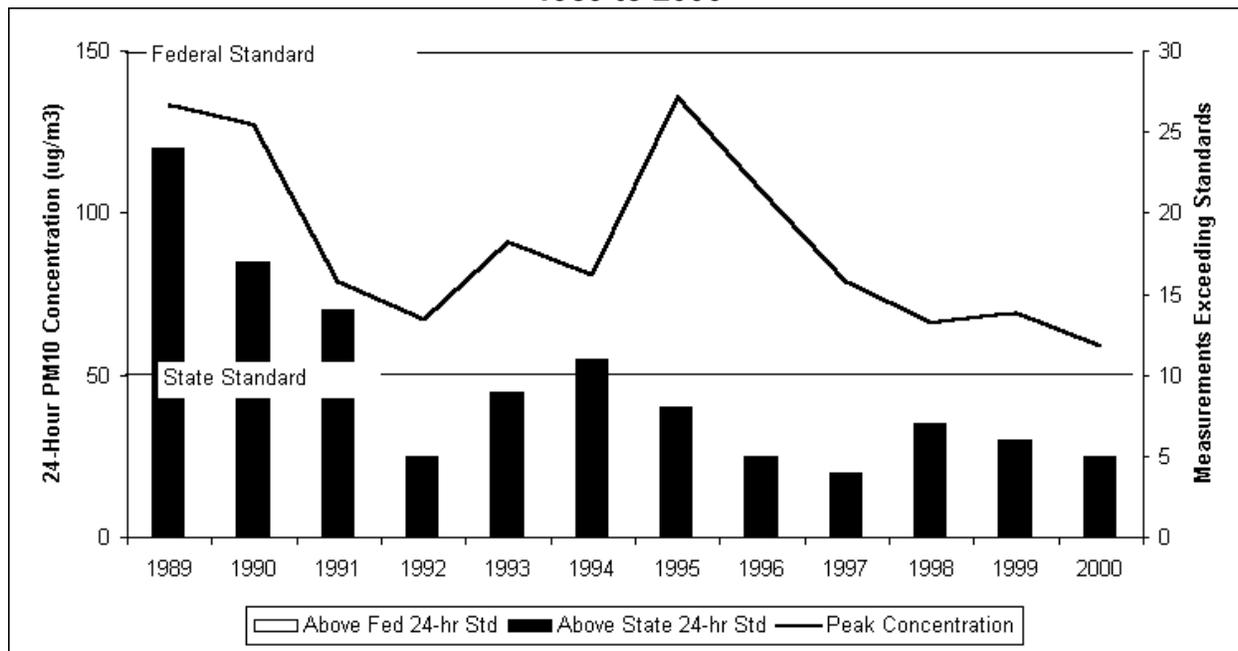


Source: California Air Resources Board

AIR QUALITY Figure 9 shows the historic (1989 to 2000) 24-hour PM10 measurements made at the Hawthorne monitoring station. As can be seen, the federal 24-hour PM10 standard (150 ug/m³) has not been exceeded since 1989 at this station, however the state 24-hour PM10 standard continues to be exceeded. The annual maximum 24-hour PM10 measurements at the Hawthorne monitoring station improved from 1989 to 1992, but appears to degrade from 1992 to 1996. Between 1997 and 2000, the trend seems to be controlled and improving. Therefore, staff recommends the use of the 1999

annual maximum 24-hour PM10 measurement recorded at the Hawthorne monitoring station to represent the background 24-hour PM10 concentrations for modeling purposes. That measurement is 69 ug/m³.

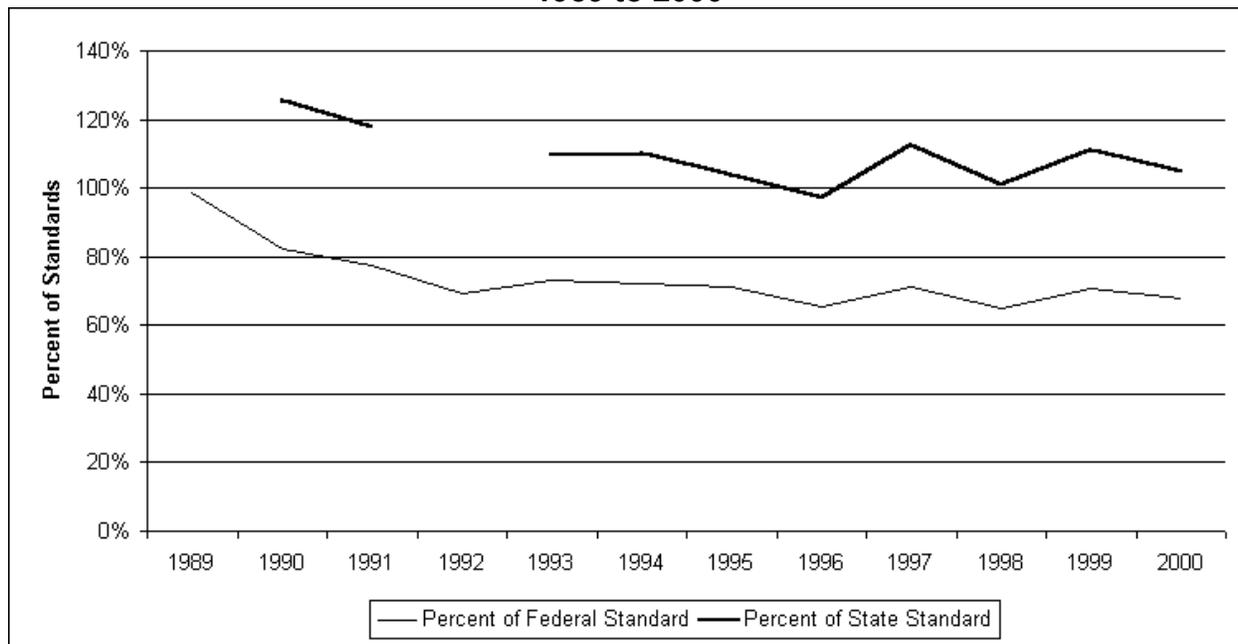
AIR QUALITY Figure 9
Historic 24-hour PM10 Measurements
Hawthorne Monitoring Station
1989 to 2000



Source: California Air Resources Board

AIR QUALITY Figure 10 shows the annual geometric and arithmetic means for the PM10 measurements at the Hawthorne monitoring station from 1989 to 2000 as a percent of the State and Federal annual PM10 ambient air quality standards. There is a notable improvement from 1989 to 1992, which stabilizes between 32 and 36 ug/m³ thereafter for the federal standard. For the state standard, there is also an improvement from 1989 to 1992, but stabilizes between 29 and 34 ug/m³. Staff recommends the use of the highest recent measurements to represent the annual PM10 background for modeling purposes. In staff's opinion the highest recent measurement for the arithmetic mean (federal standard) at the Hawthorne monitoring station was 35.4 ug/m³ in 1999. The highest recent measurement for the geometric mean (state standard) at the same monitoring station was 33.8 ug/m³ in 1998.

AIR QUALITY Figure 10
Historic Annual PM10 Measurements
Hawthorne Monitoring Station
1989 to 2000



Source: California Air Resources Board

Secondary PM10

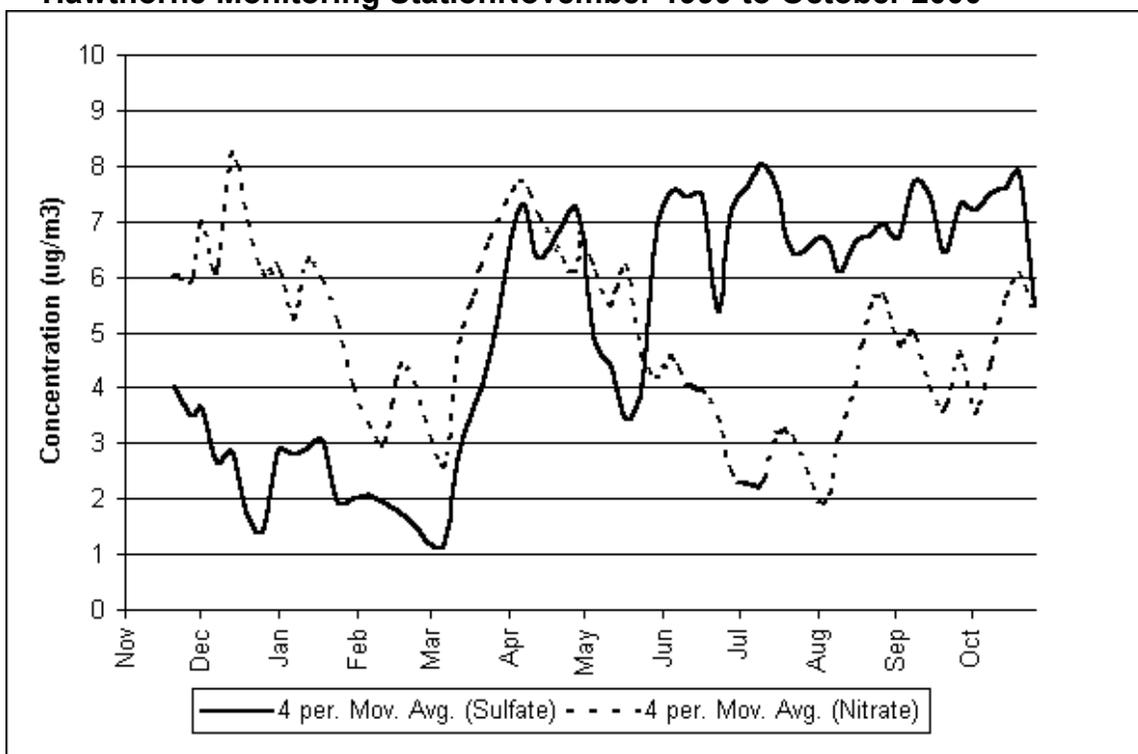
PM10 can be formed downwind from an emission source as a secondary emission (similar to ozone) from a reaction between ammonia and airborne acids. The most dominant reactions are between SO_x emissions (as sulfuric acid, H₂SO₄) and NO_x emissions (as nitric acid, HNO₃). The complexity of these reactions arises from the formation of gaseous, liquid and solid forms of the products and reactants involved. The qualitative understanding of these reactions indicates that all the available ammonia will be reacted with all the available sulfuric acid prior to any ammonia being reacted with any available nitric acid (Seinfeld 1986). From this presumption, two cases of interest arise. In the sulfate rich case, where the molar ratio of ammonia (NH₃) to sulfate (SO₄) is less than 2, there is insufficient ammonia to react with the sulfate. In the ammonia rich case, where the molar ratio of ammonia to sulfate is greater than 2, the sulfate is completely reacted and there is excess ammonia (Seinfeld 1986).

There has been no direct measure of ambient concentrations of ammonia in the general vicinity of the El Segundo project site. The closest measurement taken was in a 1995 study on the characterization of PM_{2.5} and PM₁₀ in the South Coast Air Basin that included a monitoring site in downtown Los Angeles (SCAQMD 2000a). As part of that study the ammonia ion NH₄⁺ was measured along with sulfates, nitrates and other contributors to PM₁₀ and PM_{2.5}. The data recorded in the South Coast study seems to indicate that the downtown Los Angeles area is ammonia rich (i.e., the molar ratio of ammonia to sulfate is greater than 2:1) from September through April and ammonia poor from May through August. This is generally the trend for the rest of the monitoring sites reported in the study with the exception of the San Bernardino area. The study also shows that PM₁₀ and PM_{2.5} peaked in the October – December time frame at

approximately 200 ug/m³ for PM10. The rest of the year, PM10 was measured at approximately 50 ug/m³ for the Los Angeles downtown area. The study indicates that during the summer months, the on-shore winds in the area tend to increase the dust component of the PM10 and reduce the secondary component to a low of 22% of the total PM10 concentration. During the winter months, a high pressure system can form in the desert areas of San Bernardino, trapping air in the Los Angeles basin. This condition was identified as the cause of the formation of high concentrations of secondary PM2.5, as high as 82% of the total PM10 mass. The study concludes that concentrations of sulfate were highest in the summer and lowest in the winter, while concentrations of nitrates were highest in the fall. The study indicates that on an annual average basis, the downtown Los Angeles area is clearly ammonia rich.

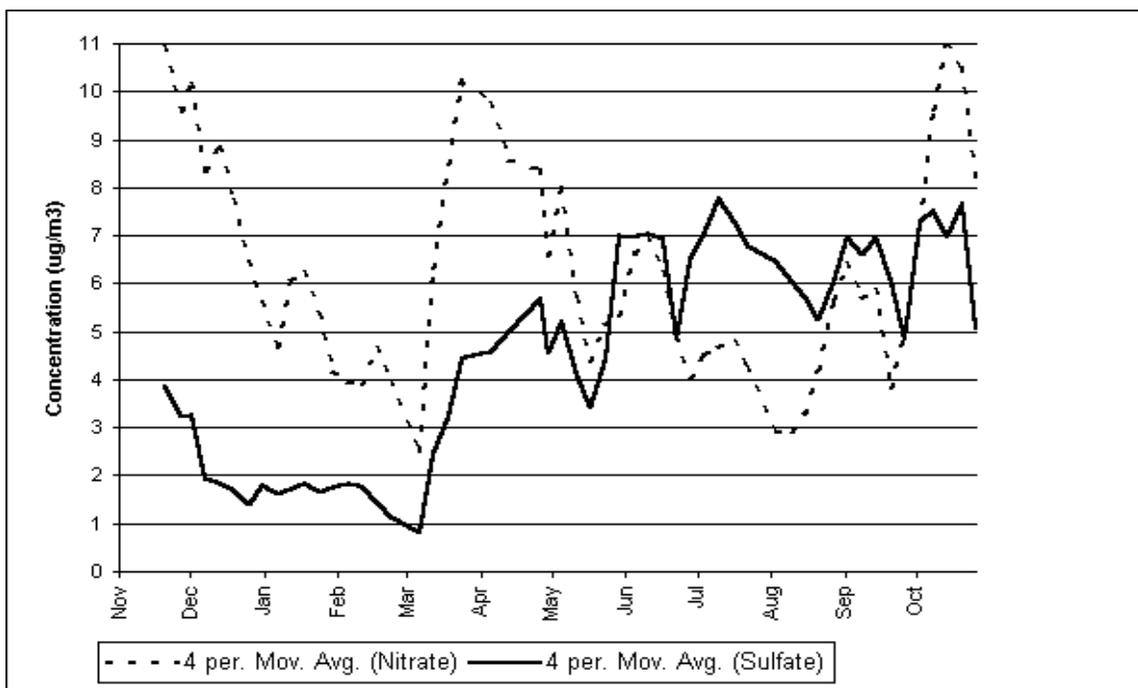
AIR QUALITY Figure 11, shows a four point moving average of the measured nitrate and sulfate concentrations at the Hawthorne monitoring station. As can be seen, the sulfate concentration peaks in the summer months while nitrate peaks in the fall. Comparatively, the sulfate and nitrate components in downtown Los Angeles are similar although higher than those at the Hawthorne station (see **AIR QUALITY Figure 12**). It is staff's opinion that this tends to indicate that the two areas are very similar in ambient chemical composition. It is therefore staff's opinion that the ambient ammonia conditions in the downtown Los Angeles can be substituted for the ambient conditions in the El Segundo area.

AIR QUALITY Figure 11
Hawthorne Monitoring Station November 1999 to October 2000



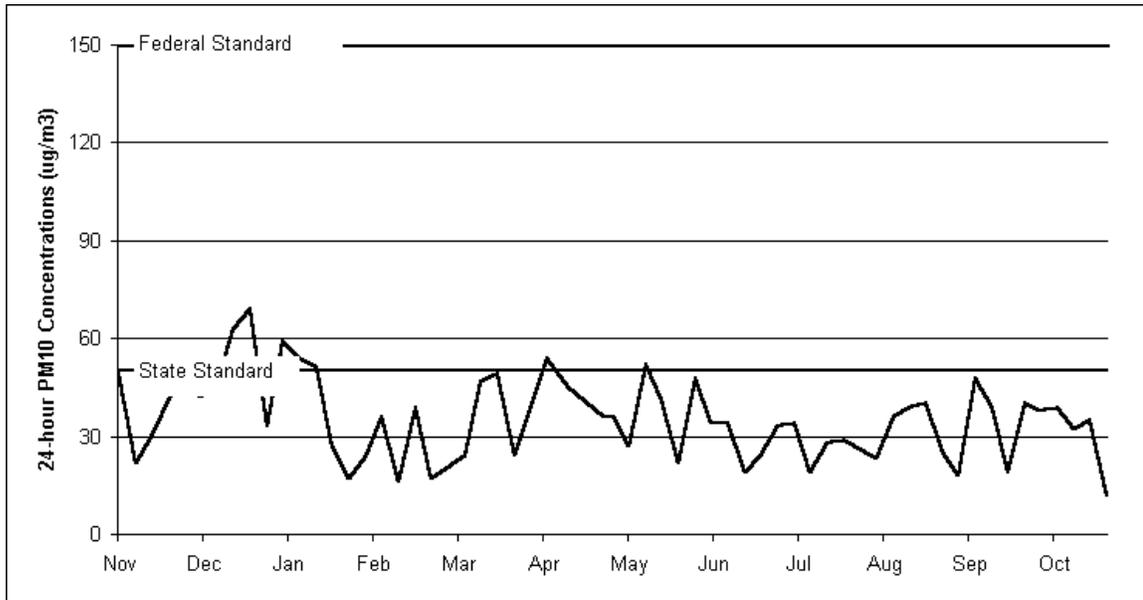
AIR QUALITY Figure 12

**Los Angeles Main Street Monitoring Station
November 1999 to October 2000**



Based on the presumption that the area downwind of the project is ammonia rich from September through April, it is staff's opinion that the ammonia emissions from the project do not have the potential to cause or contribute to an exceedance of the PM10 ambient air quality standard during this time frame. From April through September, the background concentrations of PM10 at the Hawthorne monitoring station have been below the state ambient air quality 24-hour standard with the exception of two excursions, one in April and one in May (see **AIR QUALITY Figure 13**). It has been determined in other power plant licensing cases that the potential impact of power plant ammonia emissions, with a 10 ppm limit, is approximately 1 ug/m³ of secondary PM10 formation. This project will be limited to 5 ppm ammonia slip. It is therefore staff's opinion that this level of impact does not have the potential to cause or contribute to an exceedance of the state or federal 24-hour PM10 ambient air quality standards.

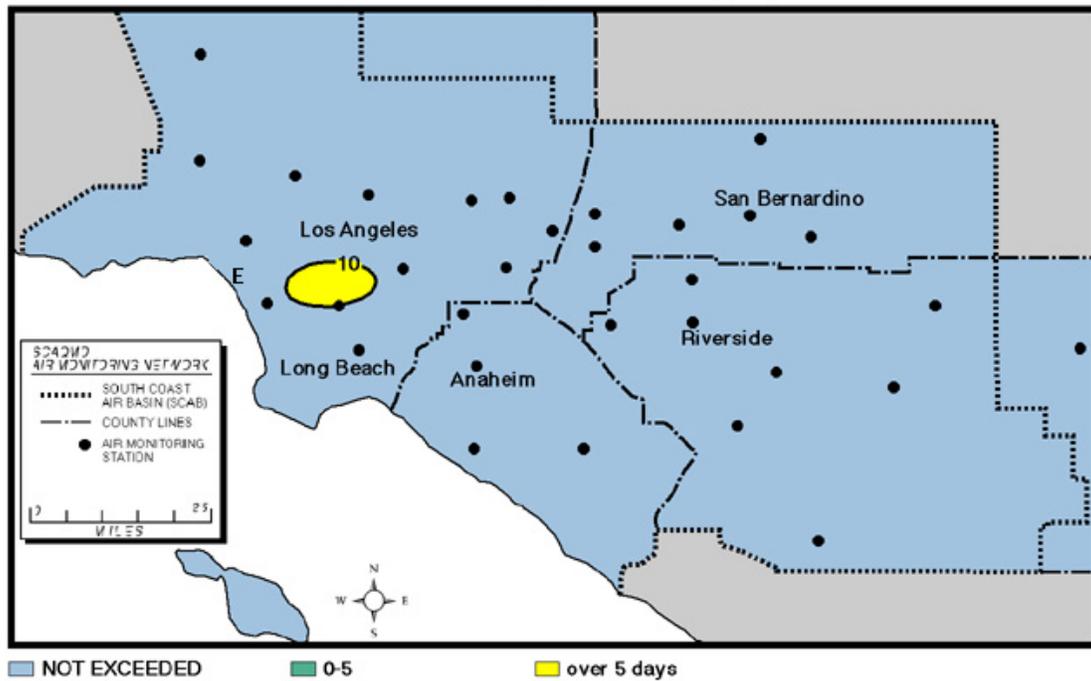
AIR QUALITY Figure 13
24-Hour PM10 Measurements
Hawthorne Monitoring Station
November 1999 to October 2000



Carbon Monoxide

Carbon monoxide (CO) is a directly emitted air pollutant as a result of combustion. The South Coast Air Quality Management District is designated Serious Non-Attainment for the federal 1-hour and 8-hour CO ambient air quality standards. This means that the area has an average CO concentration value of 16.5 ppm or above. However, as **AIR QUALITY Figure 14** shows, the exceedances of the federal CO standard occur in downtown Los Angeles which is more than 10 miles from the project site.

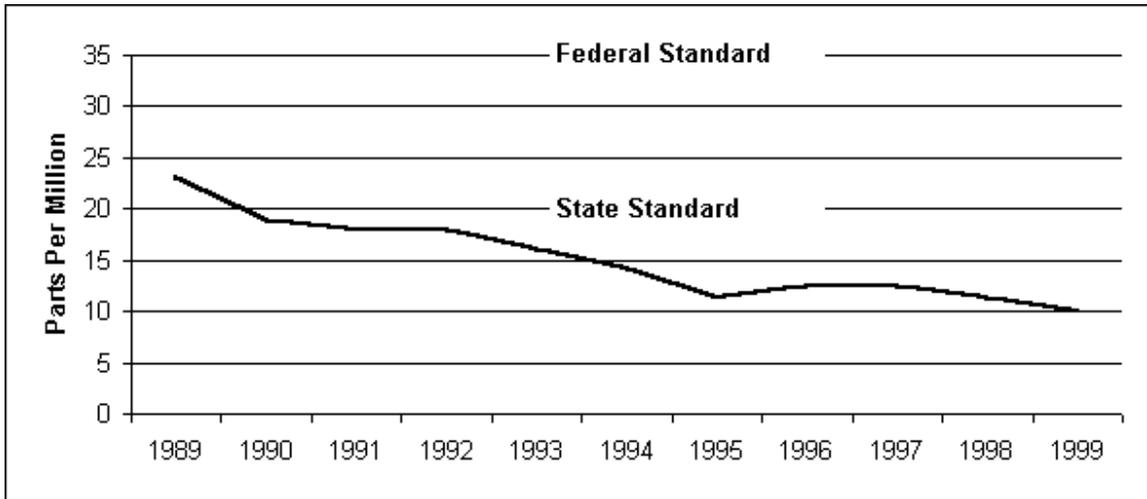
AIR QUALITY Figure 14
CARBON MONOXIDE - 1998
 Number of Days Exceeding Federal Standard
 (8-Hour Average CO > 9.5 ppm)



Source: 1998 Air Quality Standards Compliance Report, South Coast Air Quality Management District

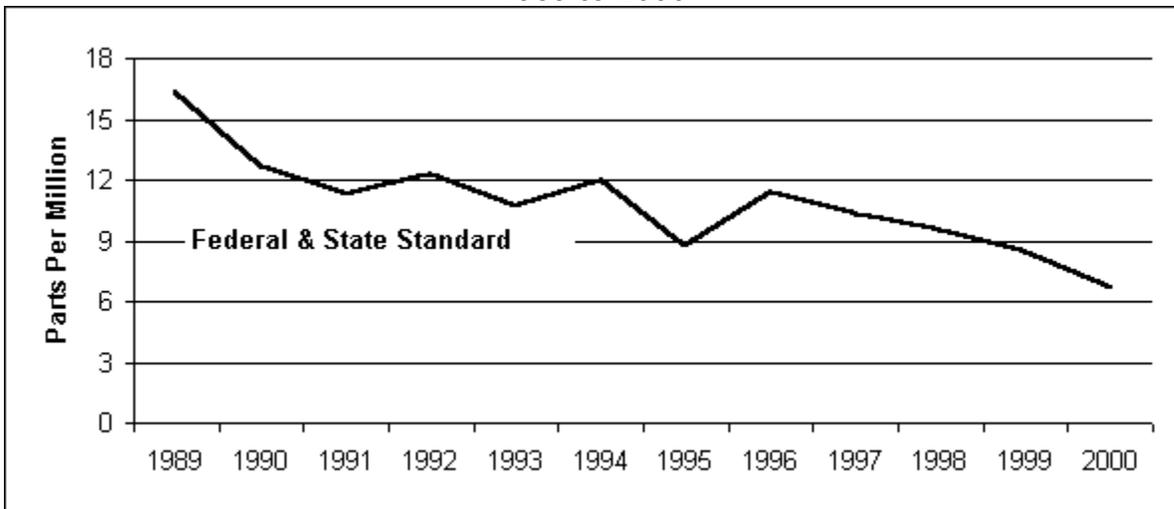
The closest CO monitoring station to the project site is the Hawthorne monitoring station. AIR QUALITY Figures 15 and 16 show the historical CO concentrations at the Hawthorne monitoring station. These figures demonstrate a slight downward trend from 1989 to 2000. Therefore, staff recommends the lowest value be used for the background CO concentrations for air quality impact modeling purposes. For both the 1-hour and 8-hour standards, this is the 1999 measurement of 10 ppm and 6.64 ppm respectively.

AIR QUALITY Figure 15
Historical 1-Hour CO Concentrations
Hawthorne Monitoring Station
1989 to 1999



Source: California Air Resources Board

AIR QUALITY Figure 16
Historical 8-Hour CO Concentrations
Hawthorne Monitoring Station
1989 to 2000

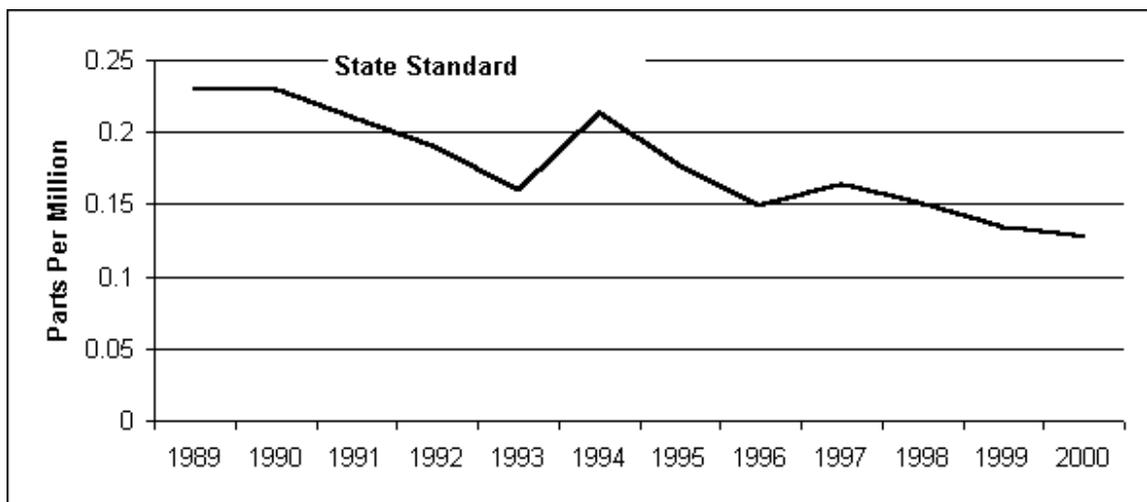


Source: California Air Resources Board

Nitrogen Dioxide

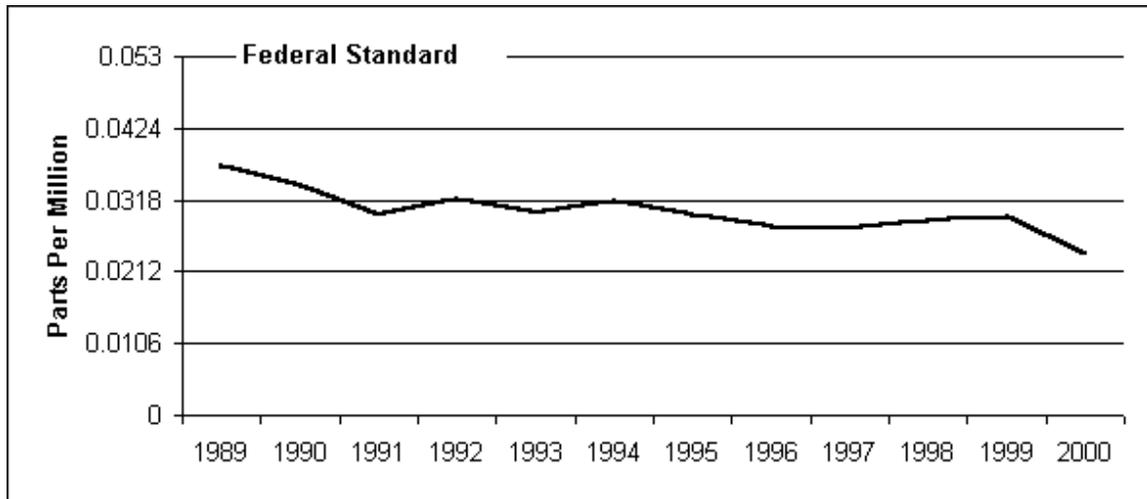
Nitrogen dioxide (NO₂) can be emitted directly as a result of combustion or formed from nitric oxide (NO) and oxygen. NO is typically emitted from combustion sources and readily reacts with oxygen or ozone to form NO₂. The NO reaction with ozone can occur within minutes and is typically referred to as ozone scavenging. By contrast, the NO reaction with oxygen is on the order of hours under the proper conditions. The South Coast Air Basin is designated attainment for both the state and federal NO₂ ambient air quality standards. AIR QUALITY Figures 17 and 18 show the 1-hour and annual NO₂ concentrations measured at the Hawthorne monitoring station, the closest NO₂ monitoring station to the project site. These figures show a slight, but erratic improvement in NO₂ concentrations from 1989 to 2000. Staff therefore recommends, based on the trend of improvement, that the 2000 measurements be used as the most reasonable, representative and highest values for both the 1-hour and annual background NO₂ ambient air concentrations. The 1-hour and annual average NO₂ concentrations measured at the Hawthorne monitoring station in 2000 are 0.128 ppm and 0.024 ppm respectively.

**AIR QUALITY Figure 17
Historical 1-Hour NO₂ Concentrations
Hawthorne Monitoring Station
1989 to 2000**



Source: California Air Resources Board

AIR QUALITY Figure 18
Historical Annual Average NO₂ Concentrations
Hawthorne Monitoring Station
1989 to 2000

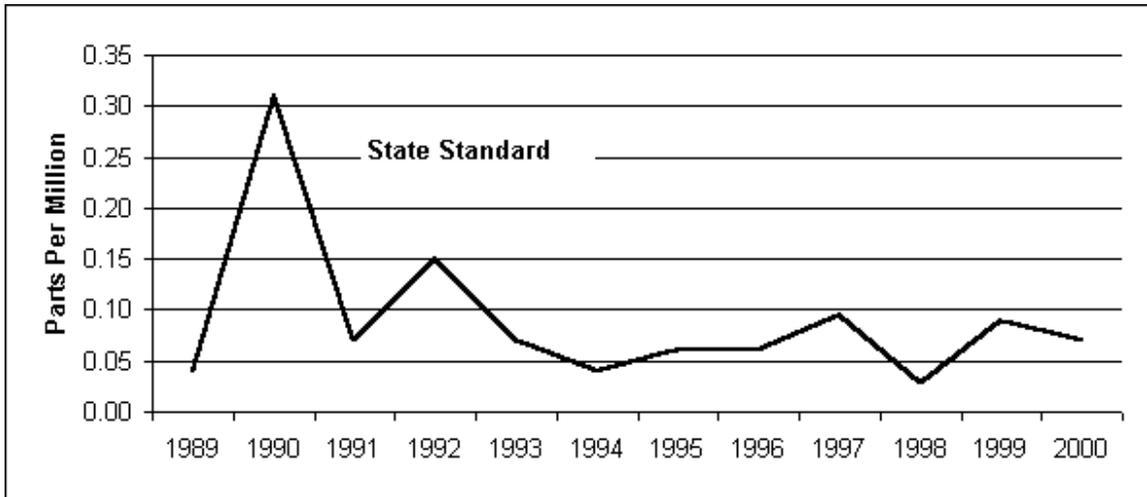


Source: California Air Resources Board

Sulfur Dioxide

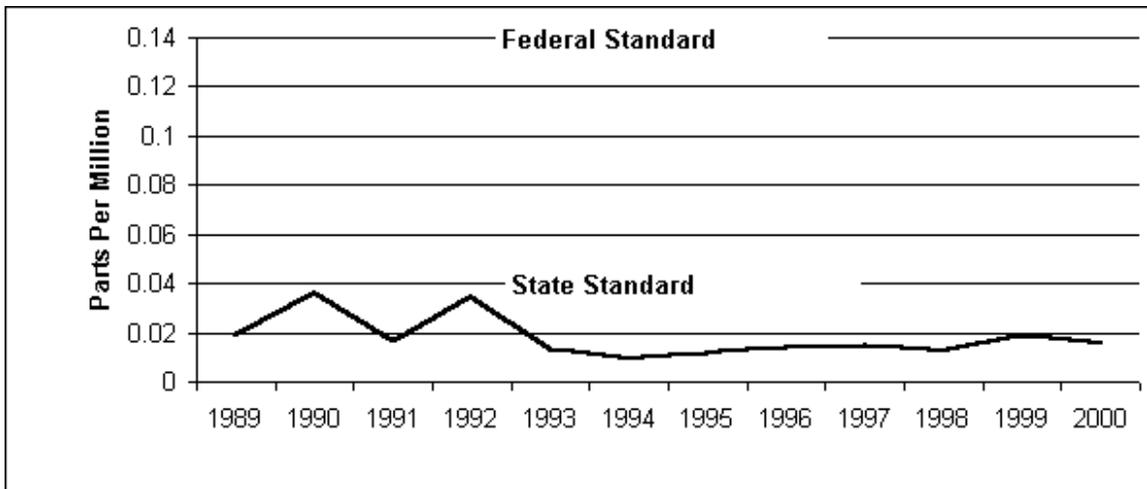
Sulfur dioxide is typically emitted as a result of the combustion of a fuel containing sulfur. Fuels such as natural gas contain very little sulfur and consequently have very low SO₂ emissions when combusted. By contrast, fuels high in sulfur content such as lignite (a type coal) emit very large amounts of SO₂ when combusted. Sources of SO₂ emissions within the South Coast Air District come from every economic sector and include a wide variety of fuels, including gaseous, liquid and solid. The South Coast air basin is designated attainment for all the SO₂ state and federal ambient air quality standards. The closest SO₂ monitoring station to the project site is the Hawthorne monitoring station. AIR QUALITY Figures 19, 20 and 21 show the historic 1-hour, 24-hour and annual average SO₂ concentrations measured at the Fontana monitoring station. These figures show that the concentrations of SO₂ are far below the state and federal SO₂ ambient air quality standards. However, the trends are ambiguous and indicate neither an increase nor a decrease in SO₂ concentrations. Therefore, staff recommends the highest concentrations within the last 5 years be used to represent the background for SO₂ for modeling purposes. For the 1-hour standard, this is 0.096 ppm (measured in 1997). For the 24-hour standard, it is 0.014 ppm (1999). For the annual standard, it is 0.004 (1999).

AIR QUALITY Figure 19
Historical 1-Hour SO₂ Concentrations
Hawthorne Monitoring Station
1989 to 2000



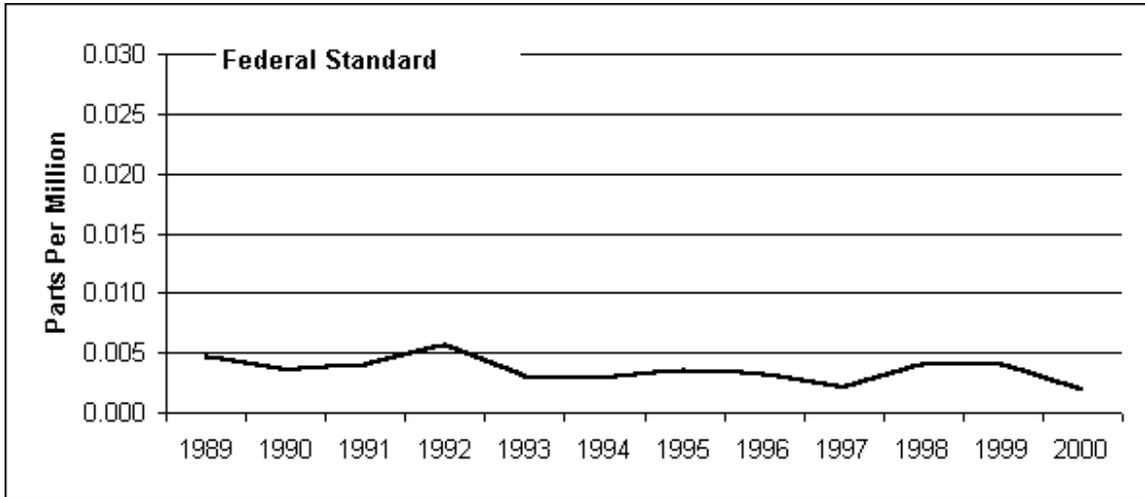
Source: California Air Resources Board

AIR QUALITY Figure 20
Historical 24-Hour SO₂ Concentrations
Hawthorne Monitoring Station
1989 to 2000



Source: California Air Resources Board

AIR QUALITY Figure 21
Historical Annual Average SO₂ Concentrations
Hawthorne Monitoring Station
1989 to 2000



Source: California Air Resources Board

Summary

In summary, staff recommends the background ambient air concentrations in AIR QUALITY Table 4 for the purpose of modeling and evaluating potential ambient air quality impacts from the proposed project.

AIR QUALITY Table 4
Staff Recommended Background Concentrations

Pollutant	Averaging Time	Concentration (ug/m ³)	Concentration (ppm)
Ozone	1 Hour	178	.089
Particulate Matter	Annual Geometric Mean	33.8	--
	Annual Arithmetic Mean	35.4	--
	24 Hour	69	--
Carbon Monoxide	8 Hour	7,378	6.64
	1 Hour	11,428	10
Nitrogen Dioxide	Annual Average	45.3	0.024
	1 Hour	240	0.128
Sulfur Dioxide	Annual Average	10.7	0.004
	24 Hour	36.5	0.014
	1 Hour	251.5	0.096

PROJECT DESCRIPTION AND EMISSIONS

CONSTRUCTION

The ESPR includes the following major elements at the project site:

- The demolition of Boiler Units 1 and 2.
- The addition of two General Electric Frame 7FA gas fired combustion turbines with duct-fired heat recovery steam generators (HRSG) driving one steam turbine, arranged as a 2-on-1 system.
- The addition of a new 265 Bhp diesel fired backup firewater pump.
- Minor modification of the existing power transmission and distribution system.

The ESPR also includes the following linear ancillary service projects off the project site:

- Potable and reclaimed water pipelines in parallel, 1.9 miles long.
- A sanitary discharge pipeline, 200 feet long.
- An aqueous ammonia supply pipeline, 0.5 miles long.

On-site demolition of the existing boiler units is expected to take approximately 6 months. Following demolition, on-site construction is expected to last 20 months with the highest fugitive emissions occurring in the fourth month and the highest overall emissions occurring in the sixth month. Offsite construction is expected to be completed much faster than on-site construction, on the order of four months.

ESPII proposes to implement the following measures to reduce emissions during construction activities. The emission estimates from ESPR that follow this section take these control measures into consideration.

To control exhaust emissions from heavy diesel construction equipment:

- Limit engine idle time and shutdown equipment when not in use (although a specific time limit was not indicated).
- Perform regular preventative maintenance to reduce engine problems.
- Use CARB Low-Sulfur fuel for all heavy construction equipment.
- Ensure that all heavy construction equipment complies with EPA 1996 Diesel standards if available.

To control fugitive dust emissions:

- Use water application or chemical dust suppressant on unpaved travel surfaces and parking areas.
- Use vacuum or water flushing on paved travel surfaces and parking areas.
- Require all trucks hauling loose material to either cover the material or maintain a minimum of two feet of freeboard.

- Limit traffic speed on unpaved roads to 25 mph.
- Install erosion control measures.
- Replant disturbed areas as soon as possible.
- Use gravel pads and wheel washers as needed.
- Use wind breaks and chemical dust suppressant or water application to control wind erosion from disturbed areas.

Project Site

The power plant itself will take approximately 20 months to construct. The power plant project construction consists of three major areas of activity: 1) the civil/structural construction; 2) the mechanical construction; and 3) the electrical construction. The largest fugitive dust emissions are generated during the civil/structural activity, where work such as demolition, grading, site preparation, foundations, underground utility installation and building erection occur. These types of activities require the use of large earth moving equipment, which generate considerable combustion emissions themselves, along with creating fugitive dust emissions. The mechanical construction includes the installation of the heavy equipment, such as the combustion and steam turbines, the heat recovery steam generators, condenser, pumps, piping and valves. Although not a large fugitive dust generation activity, the use of large cranes to install such equipment generates significantly more emissions than other construction equipment onsite. Finally, the electrical equipment installation involves such items as transformers, switching gear, instrumentation and wiring. This is a relatively small emission-generating activity in comparison to the early construction activities. From estimates made by ESPII, the highest emissions occur during the sixth month of construction. The highest daily emissions, based on the sixth month emissions, are shown in AIR QUALITY Table 5. AIR QUALITY Table 6 shows the expected annual emissions from construction activities at the project site.

AIR QUALITY Table 5
Maximum Daily On-site Construction Emissions (lbs/day)

	NOx	VOC	CO	SOx	PM10	Fugitive PM10
Construction Equipment	182.5	21.3	192.8	5.4	12.2	15.36
Truck Deliveries ¹	103.62	10.69	75.90	5.45	6.24	0.43
Rail Deliveries	83.93	3.11	8.27	5.36	2.08	2.60
Worker Travel ¹	73.51	81.95	752.02	0.10	2.47	0.45
Windblown Dust ²	--	--	--	--	--	10.32
Total ³	443.56	117.05	1029.00	16.31	23.00	29.14
1 Includes both paved and unpaved road travel 2 Includes emissions from the active construction area, laydown area and contractor parking. 3 Emission totals for the sixth month of construction.						

Source: (ESPR 2000a)

AIR QUALITY Table 6
Annual On-site Construction Emissions (tons/year)

	NOx	VOC	CO	SOx	PM10	Fugitive PM10
Construction Equipment	14.64	2.33	25.48	.41	1.05	2.09 ¹
Truck Deliveries ¹	4.67	0.48	3.42	0.25	0.27	--
Rail Deliveries	1.54	0.06	0.15	0.10	0.04	--
Worker Travel ¹	7.65	8.53	78.26	0.01	0.26	--
Windblown Dust ²	--	--	--	--	--	1.88
Total	28.50	11.40	107.31	0.77	1.62	3.97
1 Includes construction, truck deliveries, train deliveries and worker travel. 2 Includes emissions from the active construction area, laydown area and contractor parking.						

Source: (ESPR 2000a)

Linear Facilities

The linear facilities include the potable water pipelines, the wastewater pipeline and the aqueous ammonia pipeline. The construction of all linear facilities is not expected to last longer than six months. AIR QUALITY Table 7 shows the maximum daily emissions expected from the construction of all the linear facilities.

AIR QUALITY Table 7
Maximum Daily Natural Gas Pipeline Construction Emissions (lbs/day)

	NOx	VOC	CO	SOx	PM10	Fugitive PM10
Construction Equipment	107.1	7.8	33.6	3.5	6.4	5.51
Truck Deliveries	10.72	1.11	7.85	0.56	0.63	0.04
Excavation	--	--	--	--	--	2.61
Back Filling	--	--	--	--	--	0.13
Windblown Dust	--	--	--	--	--	0.24
Total	117.82	8.91	41.45	4.06	7.03	8.53

Source: (ESPR 2000a)

OPERATIONAL PHASE

Equipment Description

The equipment at the ESPR will consist of the following components:

- Two natural gas fired General Electric Frame 7FA combustion turbine generators (CTG), nominally rated at approximately 175 MW (increased to 183 MW with steam injection). Each of the CTGs will be equipped with evaporative inlet air coolers;
- Each CTG would be equipped with gas fired heat recovery steam generators (HRSG) and ancillary equipment;
- One steam turbine, rated at approximately 288 MW;
- One 265 Bhp diesel fired backup firewater pump;
- Two existing gas fired utility boilers (units 3 and 4), rated at 302 MW each.

Equipment Operation

The El Segundo facility is intended to be a base loaded power plant with the capability to respond to market demands. The two remaining boilers (units 3 & 4) and the two CTGs (units 5 & 7) will operate exclusively on natural gas. The 265 Bhp backup firewater pump IC engine will operate exclusively on diesel fuel. Operation of the existing boilers (Units 3 and 4) are not considered a part of the project; however, they are reviewed in the context of potential cumulative impacts.

Emission Controls

The exclusive use of an inherently clean fuel, natural gas, will limit the formation of SO₂ and PM₁₀ emissions. Natural gas contains very small amounts of a sulfur compound known as mercaptan, which when combusted, results in sulfur dioxide emissions in the flue gas. A sulfur content of 0.25 grains of sulfur per 100 standard cubic feet of natural gas was assumed for the SO₂ emission calculations. However, in comparison to other fuels used in power plants, such as fuel oil or coal, the sulfur dioxide emissions from the combustion of natural gas are very low.

Like SO₂, the emissions of PM₁₀ from natural gas combustion are very low compared to the combustion of fuel oil or coal. Natural gas contains very little noncombustible gas or solid residue; therefore it is a relatively clean-burning fuel.

To minimize NO_x, CO and VOC emissions during the combustion process, the CTGs are equipped with the latest dry low-NO_x (DLN) combustor design developed by GE. A more detailed discussion of this combustion technology is presented in the Mitigation section of this analysis.

After combustion, the flue gases pass through the natural gas fired heat recovery steam generator (HRSG), where catalyst systems are placed to further reduce NO_x, CO and VOC emissions. ESPR is proposing to use a Selective Catalytic Reduction (SCR) system to reduce NO_x emissions. An oxidizing catalyst will also be installed in the HRSG to reduce CO and VOC emissions. A more complete discussion of these catalyst technologies is included in the Mitigation section.

The existing boilers (units 3 and 4) have been retrofitted with SCR technology for additional NO_x control. However, these activities on the facility site are unrelated to installation of the new units.

Project Operating Emissions

The air emissions associated with the ESPR are shown in AIR QUALITY Tables 8 and 9. Table 8 shows the emission rates for the GE Frame 7FA turbines equipped with DLN combustors, SCRs and oxidation catalysts. Table 8 also shows the estimated emission rates for the existing boilers (from recent source testing) and the firewater pump. AIR QUALITY Table 9 shows the emission rates for the turbines at various ambient temperatures with and without the HRSG duct firing natural gas. The emission rates in AIR QUALITY Table 9 are used to calculate the long-term annual average emissions for the ESPR. The short-term (hourly through daily) emissions are calculated using the emission rates in AIR QUALITY Table 8. The NO_x and CO emission rates shown in AIR QUALITY Table 9 assume that the ESPR will average (on an annual basis) a lower concentration than that used for the short-term emission rates. For NO_x, the short-term emission rates are based on a 2.5 ppm concentration limit, the long-term emission rates are based on a 2.0 ppm concentration. Since NO_x emissions will be continuously monitored in the stack (see compliance with LORS section), this assumption is reasonable and enforceable.

AIR QUALITY Table 8
Short-Term Estimated Emission Rates
(lbs/hour)

Equipment	Operation	NOx	SOx	CO	VOC	PM10
Turbine	Full Load ¹	18.27	1.76	11.12	6.37	15
	Full Load ²	14.04	1.2	7.68	2.56	11
	Cold Startup	80	1.2	50	2.56	11
	Warm Startup	80	1.2	62.5	2.56	11
	Hot Startup	80	1.2	100	2.56	11
Existing Boiler (units 1 and 2)	Full Load	33.90	2.01	281.4	18.43	25.46
Firewater Pump	Full Load	1.96	0.05	0.08	0.07	0.02
<p>1 The turbine is at full load in 83 °F ambient air temperature with duct firing and power augmentation.</p> <p>2 The turbine is at full load in 83 °F ambient air temperature without duct firing or power augmentation.</p>						

Source: (SCAQMD 2001c)

AIR QUALITY Table 9
Estimated Turbine Annual Average Hourly Emission Rates
(lbs/hour)

Temp. (°F)	Power Aug.	Duct Firing	NOx¹	SOx	CO²	VOC	PM10
83	On	On	18.27	1.76	11.12	6.37	15.00
83	Off	Off	12.62	1.2	7.68	2.56	11.00
41	Off	Off	14.04	1.36	8.55	2.85	11.00
<p>1 The NOx emission rates assume that the ESPR can achieve 2.0 ppm averaged over the entire year, excluding startups and shutdowns.</p> <p>2 The CO emission rates assume that the ESPR can achieve 2.0 ppm averaged over the entire year, excluding startups and shutdowns.</p>							

Source: (SCAQMD 2001c)

STARTUP

The ESPR has three general startup scenarios: cold start, warm start and hot start. Cold startups usually occur after extended periods of shutdown, typically 3 days or more. Warm startups occur generally after a shorter shutdown duration than those for cold startups, from 24 to 72 hours. Hot startups generally occur following a trip off line or non-critical emergency shutdown, usually lasting only a few hours. Except for CO emissions, the ESPII has chosen to assume that hot and warm startups emissions are the same as cold startup emissions (see AIR QUALITY Table 8). The ESPII has requested that they assume 365 hours of startups per year per turbine.

Operating Emissions

Operating emissions for the ESPR include emission from the combustion turbines, the gas-fired HRSGs (duct firing) and, for purposes of evaluating cumulative impacts, the existing boilers. Emissions from the combustion turbines vary with the ambient temperature. Generally speaking the colder the ambient temperature, the denser the inlet air. Denser air results in a slightly higher power output and a higher volume

throughput, which tends to result in higher mass emission rates. However, duct firing and power augmentation also tend to increase emissions and are not generally employed during cold weather. ESPII investigated emission rates at several different ambient temperatures, with and without duct firing and power augmentation. They found that the highest mass emission rates occur while the combustion turbine is at full load, the ambient temperature is 83 °F and the duct firing and power augmentation are both on. For normal operations, the boilers are assumed to be at full load.

Maximum Expected Emissions

The maximum expected emissions for the ESPR are calculated on an hourly, daily and annual basis. AIR QUALITY Table 10 shows the hourly emissions and assumes that the boilers and one combustion turbine are at full load while the other combustion turbine is either in startup or full load. Since both NOx and CO (and to an extent VOC) emissions are controlled through post combustion techniques, these pollutants are highest when those controls are not in operation. The only time these controls are not in operation is when the combustion turbine is undergoing a startup. Therefore, for the one-hour worst case NOx and CO emissions, the ESPII has assumed that the second combustion turbine is undergoing a hot startup. SOx, VOC and PM10 emissions are controlled mainly through good combustion practices and therefore are highest when the most fuel is being burned (i.e., full load with the duct burner and power augmentation on).

AIR QUALITY Table 10
Project Maximum Hourly Emissions
(lbs/hr)

EQUIPMENT : OPERATION	NOx	SOx	CO	VOC	PM10
Boiler Unit 3: Full Load	33.90	2.01	281.40	18.43	25.46
Boiler Unit 4: Full Load	33.90	2.01	281.40	18.43	25.46
CTG Unit 5: Turbine 1 Full Load w/DB+PA	18.27	1.76	11.12	6.37	15.0
CTG Unit 7: Turbine 2 (see notation)	80 ¹	1.76 ²	100.0 ¹	6.37 ²	15.0 ²
TOTAL	166.07	7.54	673.92	49.6	80.92
Notation: operational assumptions for the worst case hourly emissions change based on the pollutant being emitted. 1 This emission value represents the CTG undergoing a hot startup. 2 This emission value represents the CTG operating under full load with the duct burner and power augmentation on.					

AIR QUALITY: Table 11 shows the maximum daily emissions and assumes the existing boilers are operating at full load with the new turbines starting up and then operating at full load for the balance of the day. The ESPII has assumed that the combustion turbines will not operate with the duct burners and power augmentation on for more than 15 hours in any one day. The ESPII further assumes that cold startup will last for three hours and that the combustion turbines will be operated at full load without the duct burners or power augmentation on. The ESPII will stagger the startups of the

combustion turbines; however to be conservative, the ESPII assumes that the worst day will include an extra hour of operation for the second turbine to startup.

AIR QUALITY Table 11
Project Daily Emissions
(lbs/day)

Equipment: Operation	Duration	Nox	SO2	CO	VOC	PM10
Boiler Unit 3: Full Load	24	813.7	48.24	6753.6	442.22	611.04
Boiler Unit 4: Full Load	24	813.7	48.24	6753.6	442.22	611.04
CTG Unit 5 Cold Startup	3	240	3.6	150	7.68	33
CTG Unit 5 Full Load w/o DB+PA	6	84.24	7.2	46.08	15.36	66
CTG Unit 5 Full Load w/ DB+PA	15	274.05	26.4	166.8	95.55	225
CTG Unit 7 Cold Startup	3	240	3.6	150	7.68	33
CTG Unit 7 Full Load w/o DB+PA	3	42.12	3.6	23.04	7.68	33
CTG Unit 7 Full Load w/ DB + PA	15	274.05	26.4	166.8	95.55	225
Backup Firewater Pump	30 minutes	0.98	0.025	0.04	0.03	0.01
Total	24	2782.64	167.305	14209.96	1114.175	1837.09

The annual emissions for the ESPR are summarized in the AIR QUALITY Table 12. The annual emissions include 200 hours of operation from the firewater pump. The CTG Units are assumed to operate 365 hours in startup mode per turbine and 2099 hours of duct burn and power augmentation while at full load. The CTGs are assumed to operate half the year at 41°F and half at 83°F, for a total of 8,395 hour per year. The CTGs are also assumed to operate with duct burning and power augmentations half of the time that the ambient temperature is 83°F and not at all when the ambient temperature is 41°F. Duct burning and power augmentation will be used to add to the project's output during times of peak demand, which are expected to occur primarily under hot weather conditions. The boiler units are assumed to operation 8760 hours per year.

AIR QUALITY Table 12
Project Annual Emissions (including existing boilers)
(tons per year [ton/yr])

Equipment: Operation	Hours	NOx	SO2	CO	VOC	PM10
Boiler Units 3 and 4:FullLoad	8760	296.96	17.61	2,465.06	161.45	223.03
CTG Units 5 and 7						
Cold Startup	365	29.20	0.44	18.25	0.93	4.02
Warm Startup	0	0.00	0.00	0.00	0.00	0.00
Hot Start	0	0.00	0.00	0.00	0.00	0.00
Full Load, 83°F w/DB + PA	2099	38.35	3.69	23.34	13.37	31.49
Full Load, 83°F w/o DB + PA	2099	26.49	2.52	16.12	5.37	23.09
Full Load, 41°F w/o DB + PA	4197	58.93	5.71	35.88	11.96	46.17
CTG Units 5 and 7 Total	8760	152.96	12.36	93.60	31.64	104.76
Backup Firewater Pump	200	0.20	0.01	0.01	0.01	0.00
Total		450.12	29.97	2,558.67	193.09	327.79

Ammonia Emissions

Due to the large combustion turbines used in this project and the need to control NOx emissions, significant amounts of ammonia will be injected into the flue gas stream as part of the SCR system. Not all of this ammonia mixes in the flue gases to reduce NOx; a portion of the ammonia passes through the SCR and is emitted unaltered, out the stacks. These ammonia emissions are known as ammonia slip. The ESPII has committed to an ammonia slip no greater than 5 ppm, which is the current lowest ammonia slip level being permitted throughout California. On a daily basis, the ammonia slip of 5 ppm is equivalent to approximately 356 lb./day of ammonia emitted into the atmosphere per turbine.

It should be noted that the ammonia slip of 5 ppm is usually associated with the degradation of the SCR catalyst, which typically begins to occur two years or more after initial operation. At that point, the SCR catalysts are removed and replaced with new catalysts. Through most of the operation of the SCR system, ammonia slip emissions are usually in the range of 1 to 2 ppm, corresponding to a mass emissions of approximately 60 to 125 pounds per day per turbine.

INITIAL COMMISSIONING

The initial commissioning of a power plant refers to the time frame between completion of construction and the consistent production of electricity for sale on the market. Normal operating emission limits usually do not apply during initial commissioning procedures. The turbines used at the ESPR will go through several layers of testing during initial commissioning. During the first set of tests, post-combustion controls will not be operational (i.e., the SCR and oxidation catalyst).

These tests start with a Full Speed-No Load test. This test runs the turbine at approximately 20% of its maximum heat input rate. Components tested include the ignition system, synchronization with the electric generator and the turbine overspeed safety system. Part Load testing runs the turbines to approximately 60% of the maximum heat input rating. During this test the turbine and HRSG will be tuned to minimize emissions and the HRSG steam lines will be checked. Full Load testing runs the turbines to approximately 100% of their maximum heat input rate. This testing entails further tuning of the turbine and HRSG as well as the steam lines. Full Load – Partial SCR testing runs the turbines at 100% of their maximum heat input rate and operates the SCR ammonia injection grid for the first time. Finally, Full Load – Full SCR testing runs the turbines at 100% of their maximum heat input rate and operates the SCR ammonia inject grid at its full capacity. It is during this test that the SCR system will be completely tuned and operating at design levels (i.e., NOx control at 2.5 ppm).

AIR QUALITY Table 13 shows the expected emissions from the initial commissioning for both ESPR combustion turbines. Experience from recent licensing cases suggests that initial commissioning for a combined cycle system of this size lasts approximately 30 days. Additionally, daily operation of the turbines during the commissioning period is typically limited to several hours a day. Staff assumes that the turbines would be operated, on average, not more than 4 hours in a single day during the initial commissioning period. Staff also assumes that the SCR and oxidation catalyst will be installed approximately 15 days into the initial commissioning period. Based on these assumptions, staff makes the following estimates of emissions due to initial commissioning procedures.

**AIR QUALITY Table 13
Initial Commissioning Emissions Estimate**

	NOx	CO	VOC	SOx	PM10
Maximum Hourly Emissions (lbs/hr) ¹	448	902	2.6	1.8	11.0
Maximum Daily Emissions (lbs/day) ²	1,792	3,608	10.4	7.2	44.0
Total Initial Commissioning Emissions (lbs) ³	34,535	111,463	1,803	664	7,128
1 (ESPR 2000a)					
2 Maximum daily emissions are four times maximum hourly emissions.					
3 Total emissions include controlled and uncontrolled emissions for both turbines (SCAQMD 2000c).					

FACILITY CLOSURE

Eventually the ESPR will close, either as a result of the end of its useful life, or through some unexpected situation such as a natural disaster or catastrophic facility breakdown. When the facility closes, all sources of air emissions would cease and thus all impacts associated with those emissions would no longer occur.

The Permit to Operate, issued by the District, is required for operation of the facility and is usually renewed on a five year schedule. However, during those five years, the ESPII must still pay permit fees annually. If the ESPII chooses to close the facility and not pay the permit fees, then the Permit to Operate would be cancelled. In that event, the project could not restart and operate unless the ESPII pays the fees to renew the Permit to Operate.

If the ESPII were to decide to dismantle the project, there would likely be fugitive dust emissions associated with this dismantling effort. The Facility Closure Plan to be submitted to the Energy Commission Compliance Project Manager should include the specific details regarding how ESPR plans to demonstrate compliance with the District Rules regarding fugitive dust emission limitations.

PROJECT INCREMENTAL IMPACTS

MODELING APPROACH

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

CONSTRUCTION IMPACTS

The ESPII performed air dispersion modeling analyses of the potential construction impacts at the project site. The analyses included fugitive dust generated from the construction activity and combustion emissions from the equipment. The emissions used in the analysis were the highest emissions of a particular pollutant during a one month period, converted to a gram per second emission rate for the model. Most of the highest emissions occurred during the 6th month of the 20-month construction period.

The results of this modeling effort are shown in AIR QUALITY Table 14. They show that the construction activities would come close to causing a violation of the state 1-hour average NO₂ standard and further exacerbate existing violations of the state 24-hour and annual average PM₁₀ standards. In reviewing the modeling output files, the project's construction impacts are not occasional or isolated events, but are over an area within a few hundred meters of the project site.

AIR QUALITY Table 14
Maximum Construction Impacts

Pollutant	Averaging Time	Impact ($\mu\text{g}/\text{m}^3$) ²	Background ($\mu\text{g}/\text{m}^3$) ¹	Total Impact ($\mu\text{g}/\text{m}^3$)	Limiting Standard ($\mu\text{g}/\text{m}^3$)	Percent of Standard
NO ₂ ²	1-hour ³	225	240	465	470	99
	Annual ⁴	19	45.3	64.3	100	64
CO ²	1-hour	4129	11,428	15,557	23,000	68
	8-hour	1403	7,378	8,781	10,000	88
SO ₂ ²	1-hour	115	251.5	366.5	655	56
	24-hour	13	36.5	49.5	130	38
	Annual	1	10.7	11.7	80	15
PM ₁₀	24-hour	178	69	247	50	494
	Annual ⁵	37	33.8	70.8	30	236
	Annual ⁶	37	35.4	72.4	50	145
1 See AIR QUALITY Table 4. 2 Based on daily emission during month 6. 3 Employs ozone limiting method. 4 Employs ARM method, default district ratio of 0.71. 5 Annual Geometric Mean, State Standard 6 Annual Arithmetic Mean, Federal Standard						

Source: (ESPR 2000a)

Since the general public live and work in the vicinity of the project site, the construction of the ESPR may result in unavoidable short-term impacts that may expose the general public to adverse air quality conditions. Thus, staff believes that the impact from the construction of the project could have a significant and unavoidable impact on the PM₁₀ ambient air quality standards, and should be mitigated, to the extent feasible.

PROJECT OPERATION IMPACTS

The air quality impacts of project operation are shown in the following sections for fumigation meteorological conditions, and during the facility start-up and steady-state operations.

Fumigation Impacts

During the early morning hours before sunrise, the air is usually very stable. During such stable meteorological conditions, emissions from elevated stacks rise through this stable layer and are dispersed. When the sun first rises, the air at ground level is heated, resulting in a vertical (both rising and sinking air) mixing of air for a few hundred feet or so. Emissions from a stack that enter this vertically mixed layer of air will also be vertically mixed, bringing some of those emissions down to ground level. Later in the day, as the sun continues to heat the ground, this vertical mixing layer becomes higher

and higher, and the emissions plume becomes better dispersed. The early morning air pollution event, called fumigation, usually lasts approximately 30 to 90 minutes.

The ESPII used the SCREEN3 model, which is an EPA approved model, for the calculation of fumigation impacts. AIR QUALITY Table 15 shows the modeled fumigation results and impacts on the 1-hour NO₂, CO and SO₂ standards. Since fumigation impacts will not typically occur much beyond a 1-hour period, only impacts on these 1-hour standards were addressed. The results of the modeling analysis show that fumigation impacts at either partial load (50 percent) or full load will not violate the NO₂, CO or SO₂ 1-hour standards.

AIR QUALITY Table 15
Facility Fumigation Modeling Maximum 1-Hour Impacts

Pollutant	Impact ¹ (µg/m ³)	Background ² (µg/m ³)	Total Impact (µg/m ³)	Limiting Standard (µg/m ³)	Percent of Standard
NO ₂	4.33	240	244.33	470	52
CO	6.32	11,428	11,434.32	23,000	50
SO ₂	0.34	251.5	251.84	655	38
1 Impacts include emissions from both turbines with duct burners					
2 See AIR QUALITY Table 4					

Source (ESPR 2000a)

Operational Modeling Analysis

The ESPII provided staff with a modeling analysis, using the ISCST3 and CTSCREEN models to quantify the potential impacts of the project for both turbines, during normal steady state operation and during start-up conditions. This modeling analysis consisted of a screening level and a refined level analysis. The screening level analysis tested basic operating conditions, which combined various load levels and duct burner operations with several ambient air temperatures. The refined modeling was developed from these screening level runs. The refined modeling impacts are shown in AIR QUALITY Table 16.

In modeling the project operational emission impacts, the ESPII has chosen to include emissions from the base load operation of the existing boiler units 3 and 4, even though these emissions would normally be considered part of the background concentrations. This conservative approach over estimates the project's potential ambient air quality impacts. The ESPII has modeled the startup emissions and steady state operational emissions of the CTG systems alone as well. These emission impacts are compared in the El Segundo AFC in Table 5.2-36 (ESPR 2000a) and clearly demonstrate the conservative nature of the ESPII's assumptions. The project's PM₁₀ impacts could contribute to existing violations of the state 24-hour and annual average PM₁₀ standards. Because of the conservatism of the air dispersion model itself, staff believes that the actual impacts from the project would be somewhat less than the projected modeled impacts shown in AIR QUALITY Table 16.

AIR QUALITY Table 16
Facility Modeling Maximum Impacts

Pollutant	Averaging Time	Impact (µg/m³)²	Back-Ground¹ (µg/m³)	Total Impact (µg/m³)	Limiting Standard (µg/m³)	Percent of Standard
NO ₂	1-hour	93.2	240	333.2	470	71
	Annual	2.0	45.3	47.3	100	47
CO	1-hour	278.5	11,428	11706.5	23,000	51
	8-hour	173.6	7,378	7551.6	10,000	76
SO ₂	1-hour	4.8	251.5	256.3	655	39
	24-hour	0.7	36.5	37.2	105	35
	Annual	0.1	10.7	10.8	80	14
PM ₁₀	24-hour	9.4	69	78.4	50	157
	Annual³	1.4	33.8	35.2	30	117
	Annual ⁴	1.4	35.4	36.8	50	74
<p>1 See AIR QUALITY Table 4</p> <p>2 Emissions include CTG, duct burners, boiler units 3 and 4 and the fire water pump</p> <p>3 Annual Geometric Mean, State Standard</p> <p>4 Annual Arithmetic Mean, Federal Standard</p>						

Source (ESPR 2000a)

Secondary Pollutant Impacts

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

Secondary PM₁₀ formation, as discussed earlier, is the process of conversion from gaseous reactants to particulate products. The process of gas-to-particulate conversion is complex and depends on many factors, including local humidity and the presence of other compounds. Currently, there are no agency (EPA or CARB) recommended models or procedures for estimating nitrate or sulfate formation.

Nevertheless, studies during the past two decades have provided data on the oxidation rates of SO₂ and NO_x. The data from these studies can be used to approximate the conversion of SO₂ and NO_x to particulate. This can be done by using an aggregate

conversion factor (typically about 0.01 to 1 percent per hour) with Gaussian dispersion models such as ISCST3. The model is run with and without chemical conversion (decay factor) and the difference corresponds to the amount of SO₂ and NO₂ that is converted to particulate. This approach is an over simplification of a complex process; nevertheless, given the stringency of the PM₁₀ standards, and the need to address interpollutant conversion rates in setting offset ratios for interpollutant trading, staff believes this issue needs to be addressed. However, as discussed in the setting section, it is staff's opinion that the ammonia emissions from the ESPR do not, alone, have the potential to cause or contribute to an exceedance of the short-term or long-term, state or federal ambient air quality standards. NO_x and SO₂ emissions if left unmitigated, do have the potential to contribute to secondary PM₁₀ formation and thus higher PM₁₀ levels in the area.

VISIBILITY IMPACTS

A visibility analysis of the project's gaseous emissions is required under the Federal Prevention of Significant Deterioration (PSD) permitting program. The analysis addresses the contributions of gaseous emissions (primarily NO_x) and particulate (PM₁₀) emissions to visibility impairment on the nearest Class 1 PSD areas, which are national parks and national wildlife refuges. The nearest Class 1 areas to the ESPR site are the Cucamonga and San Gabriel Wilderness areas. ESPR used the EPA approved model ISCST3 to assess the project's visibility impacts. The results from the modeling analysis indicated that the project's visibility impacts would be below the significance criteria for contrast and perception. Therefore, the project's visibility impacts on these Class 1 areas are considered insignificant.

CUMULATIVE IMPACTS

To evaluate reasonably foreseeable future projects as part of a cumulative impact analysis, staff needs specific and timely information. The time in which a probable future project is well enough defined to have the information necessary to perform a modeling analysis is usually when the applicant has submitted an application to the District for a permit. Air dispersion modeling required by the District would necessitate that the ESPR develop the necessary modeling input parameters to perform a modeling analysis. Therefore, we evaluate those probable future projects in our cumulative impacts analysis that are currently under construction, or are currently under District review. Projects located up to six miles from the proposed facility site usually need to be included in the analysis. Historic and current emissions sources are represented by adding the modeled expected future project emission impacts to the measured background ambient air quality conditions. It is staff's opinion that this method satisfies the cumulative impacts requirement of CEQA.

The ESPR requested, and received from the District, a list of projects in the vicinity of the ESPR site to investigate as potential sources for the cumulative impact analysis. The final list included the Redondo Beach Power Plant, the Scattergood Power Plant, the nearby Chevron refinery and the Los Angeles International Airport. Upon further investigation by both the ESPR and Energy Commission staff, it was revealed that the Redondo Beach, Scattergood and LAX sources are reducing emissions through added control technologies. Prior to receiving public comments on the PSA, staff also was under the impression that the Chevron refinery was reducing emissions from a cracking

unit. Initially following the public comment, staff concluded that there were no additional emissions foreseeable at the Chevron Refinery that would be of interest for the cumulative assessment. Subsequently, staff determined that there will be new, unmitigated combustion related emissions at the Chevron Refinery as part of the gasoline reformulation project (replacing MTBE with ethanol). The actions taken at the Chevron Refinery will result in a decrease in NO_x emissions, but an increase in SO_x, CO, VOC and PM₁₀. The increase in PM₁₀ emissions is of the greatest concern, since the SCAQMD is not in attainment for the 24-hour or annual PM₁₀ ambient air quality standards. It is unlikely that additional emissions of SO_x, CO or VOC would cause or contribute to an exceedance of the ambient air quality standards for those pollutants.

The maximum PM₁₀ impacts for the ESP II facility, shown in AIR QUALITY Table 16, occur inside the facility boundaries of the Chevron Refinery. According to the Environmental Impact Report for the changes at the Chevron Refinery (dated November 2001), the maximum impacts from the new Chevron emissions also occur within the facility boundaries. It is therefore reasonably foreseeable in staff's opinion that these two maximum impacts could coincide. The maximum PM₁₀ impact from the Chevron Refinery is 1.98 ug/m³ averaged over 24-hours, and 0.43 ug/m³ averaged over a year. Adding these impacts to the expected ESP II impacts and the background ambient air quality yields a cumulative impact of 80.4 ug/m³ averaged over 24-hours (or 161% of the standard) and 35.6 ug/m³ averaged over a year (or 120% of the standard). If left unmitigated, staff would consider the ESP II contribution to this cumulative impact significant.

ENVIRONMENTAL JUSTICE IMPACTS

In this section staff will discuss the potential impacts regarding air quality related environmental justice issues. This section is not intended to provide a definitive analysis on environmental justice impacts in general, but only addresses those concerns related to air quality. Conclusions reached here are limited in scope to air quality impacts only.

Environmental Justice impacts are determined based on the principle that low income and minority populations may incur a higher portion of pollution due to their proximity to light or heavy industry as compared to affluent or non-minority populations. In determining if there is such an impact, staff must first determine where, if anywhere, low income or minority population exist and at what demographic concentrations. Concentrations of low income or minority populations at greater than 50% within a census tract would designate that tract as an Environmental Justice Population (EJP). Once an EJP has been identified within six miles of the proposed site, then the direct air quality impact (excluding ozone and secondary PM₁₀ impacts) on that EJP must be compared with the impacts on non-EJPs (within six miles). If the impact on the EJP is significant as well as disproportionately higher than that on the non-EJP, then staff must conclude that there is a potential for an Environmental Justice Impact if the emissions are left unmitigated.

Based on the demographics information provided in the **Staff Assessment Socioeconomic Section**, staff concludes that the nearest population that would qualify as a EJP is approximately 2.3 miles east of the project site, on the opposite side of the

Chevron Refinery. As shown in AIR QUALITY Table 16, the ESPR has the potential to cause an exceedance of the 24-hour and annual PM10 standards (if left unmitigated). Therefore, staff will consider only the directly emitted PM10 emissions from the ESPR for the purpose of an Environmental Justice evaluation. According to the modeling provided by the ESPII, the maximum potential PM10 impacts on the EJP is approximately 0.0319 ug/m³. Comparatively the maximum potential PM10 impacts on the Manhattan Beach area (non-EJP) is 1.36 ug/m³, or 42 times that of the identified EJP. Therefore, staff concludes that there is no potential for an air quality based significant environmental justice impact from the criteria air pollutant emissions of the ESPR project on the identified EJP.

MITIGATION

APPLICANT'S PROPOSED MITIGATION

Construction Mitigation

ESPII proposes to implement the following measures to reduce emissions during construction activities. The emission estimates from ESPR that follow this section take these control measures into consideration.

To control exhaust emissions from heavy diesel construction equipment

- Limit engine idle time and shutdown equipment when not in use.
- Perform regular preventative maintenance to reduce engine problems.
- Use CARB Ultra Low-Sulfur fuel for all heavy construction equipment.
- Ensure that all heavy construction equipment complies with EPA 1996 Diesel standards, to the extent feasible
- To control fugitive dust emissions
- Use water application or chemical dust suppressant on unpaved travel surfaces and parking areas.
- Use vacuum or water flushing on paved travel surfaces and parking areas.
- Require all trucks hauling loose material to either cover or maintain a minimum of two feet of freeboard.
- Limit traffic speed on unpaved roads to 25 mph.
- Install erosion control measures.
- Re-plant disturbed areas as soon as possible.
- Use gravel pads and wheel washers as needed.
- Use wind breaks and chemical dust suppressant or water application to control wind erosion from disturbed areas.

Operations Mitigation

The ESPR's air pollutant emissions impacts will be reduced by using emission control equipment on the project and by providing emission offsets. To reduce NOx emissions, the ESPII proposes to use dry-low NOx combustors in the CTGs and a Selective Catalytic Reduction system with an ammonia injection grid.

To reduce CO emissions, the ESPII proposes to use a combination of good combustion and maintenance practices, along with an oxidizing catalyst located in the HRSG. VOC and PM10 emissions will be limited by the use of a clean-burning fuel (natural gas) and the efficient combustion process of the CTGs. The use of natural gas as the only fuel will limit SO2 emissions.

Combustion Turbine

Dry Low-NOx Combustors

Over the last 20 years, combustion turbine manufacturers have focused their attention on limiting the NOx formed during combustion. One method has been steam or water injection into the combustor cans to reduce combustion temperatures and the formation of NOx. Because of the expense and efficiency losses that result from these methods, CTG manufacturers are presently choosing to limit NOx formation through the use of dry low-NOx technologies. The GE version of the dry low-NOx combustor is a two-stage ignition system. Initially the fuel/air mixture is ignited in two independent combustors and enters a premix stage (0% to 60% load). The low emissions are achieved from approximately 60% load on with the ignition of the center burner.

In this process, firing temperatures remain somewhat low, minimizing NOx formation, while thermal efficiencies remain high. At steady state CTG loads greater than 60 percent, NOx concentrations entering the HRSG are 9 ppm corrected to 15 percent O2. CO concentrations are more variable, with concentrations greater than 100 ppm up to approximately 60 percent load, dropping to 9 ppm from there on.

Flue Gas Controls

To further reduce the emissions from the combustion turbines before they are exhausted into the atmosphere, flue gas controls, primarily catalyst systems, will be installed in the HRSGs. The ESPII is proposing two catalyst systems, a selective catalytic reduction system to reduce NOx, and an oxidizing system to reduce CO.

Selective Catalytic Reduction (SCR)

Selective catalytic reduction refers to a process that chemically reduces NOx by injecting ammonia into the flue gas stream over a catalyst in the presence of oxygen. The process is termed selective because the ammonia reducing agent preferentially reacts with NOx rather than oxygen, producing inert nitrogen and water vapor. The performance and effectiveness of SCR systems are related to operating temperatures, which may vary with catalyst designs. Flue gas temperatures from a combustion turbine typically range from 950 to 1100°F.

Catalysts generally operate between 600 to 750°F (ARB 1992), and are normally placed inside the HRSG where the flue gas temperature has cooled. At temperatures lower than 600°F, the ammonia reaction rate may start to decline, resulting in increasing ammonia emissions, called ammonia slip. At temperatures above about 800°F, depending on the type of material used in the catalyst, damage to some catalysts can occur. The catalyst material most commonly used is titanium dioxide, but materials such as vanadium pentoxide, zeolite, or a noble metal are also used. These newer catalysts (versus the older alumina-based catalysts) are resistant to fuel sulfur fouling at temperatures below 770°F (EPRI 1990).

Regardless of the type of catalyst used, efficient conversion of NO_x to nitrogen and water vapor requires uniform mixing of ammonia into the exhaust gas stream. Also, the catalyst surface has to be large enough to ensure sufficient time for the reaction to take place.

The ESPII proposes to use a combination of the dry low-NO_x combustors and SCR system to produce a NO_x concentration exiting the HRSG stack of 2.5 ppm, corrected to 15 percent excess oxygen averaged over a 1-hour period.

Oxidizing Catalyst

To reduce the turbine carbon monoxide (CO) emissions, the ESPII proposes to install an oxidizing catalyst, which is similar in concept to catalytic converters used in automobiles. The catalyst is usually coated with a noble metal, such as platinum, which will oxidize unburned hydrocarbons and CO to water vapor and carbon dioxide (CO₂). The CO catalyst is proposed to limit the CO concentrations exiting the HRSG stack to 6 ppm, corrected to 15 percent excess oxygen and averaged over 1-hour.

Emission Offsets

The ESPII will be replacing the existing boiler systems (units 1 and 2) with a 2 on 1 combustion turbine package (units 5, 6 and 7). This will result in a reduction of NO_x and CO emissions, but an increase in VOC, SO_x and PM₁₀ emissions. To mitigate these increased emission impacts, the ESPII will provide emission reduction credits (ERCs) from the District ERC bank and potentially the Priority Reserve (PM₁₀ only). The ESPR has sufficient RECLAIM trading credits (RTCs) to mitigate the facilities NO_x emissions on an annual basis. The ERCs purchased are shown in AIR QUALITY Table 17 through 19, which show the ERC certificate number, company, city of origin and the quantity of pollutant purchased for SO_x, VOC and PM₁₀. The quantity purchased is in terms of pounds per day per District banking rules. AIR QUALITY Table 20 shows a summary of both the emission reductions from the shutdown of boiler units 1 and 2 as well as the purchased ERCs. Furthermore, AIR QUALITY Table 20 compares these emission reductions to the offset liability as identified by the District in its Final Determination of Compliance (SCAQMD 2002c).

AIR QUALITY Table 17
Sulfur Dioxide Emission Reduction Credits Procured for the
EI Segundo Power Redevelopment Project Emission Offsets

Certificate Number	Company	City	Amount (lbs/day)
	ARCO		245
AQ000951 AQ003264	Multi Fuels Marketing Cc.	Newhall, Long Beach	2
Total Emission Reduction Credits			247

AIR QUALITY Table 18
Volatile Organic Compounds Emission Reduction Credits Procured for the
EI Segundo Power Redevelopment Project Emission Offsets

Certificate Number	Company	City	Amount (lbs/day)
	Honeywell		14
	National Offsets		47
	National Offsets Zone 2		50
	National Offsets		70
	Honeywell		114
Total Emission Reduction Credits			295

AIR QUALITY Table 19
PM10 Emission Reduction Credits Procured for the
EI Segundo Power Redevelopment Project Emission Offsets

Certificate Number	Company	City	Amount (lbs/day)
	Aerochem		6
AQ000210	Kenny Snadblasting	South El Monte	7
AQ002660	Multi Fuels Marketing Cc	Newhall	2
AQ000742	US Tile Zone 2	Corona	3
AQ001022 AQ000013	Multi Fuels Marketing Cc	Santa Anna Paramount	5
Total Emission Reduction Credits			23

In addition to the 23 lbs/day of PM10 shown in AIR QUALITY Table 19, ESP II is considering purchasing PM10 credits from the District Priority Reserve. If ESP II uses the 23 lbs/day of ERCs available to them, staff estimates that they will require an additional 293 lbs/day of Priority Reserve PM10 credit to satisfy District Rules 1304 and 1306. The ESP II has not stated what its exact intentions are in regards to the PM10 mitigation requirements. Staff will proceed with the assumption that the ESP II will mitigate the project PM10 impacts with 23 lbs/day of PM10 ERCs and 293 lbs/day of Priority Reserve PM10 Credits.

AIR QUALITY Table 20
Summary of Emission Reduction Credits Procured for the
EI Segundo Power Redevelopment Project Emission Offsets

	CO	SOx	VOC	PM10
	lbs/day	lbs/day	lbs/day	lbs/day
Shutdown of Units 1&2	2457	18	161	222
ERCs Purchased		247	295	316 ^a
TOTAL	2457	265	356	538

^a This value includes 23 lbs/day of PM10 ERCs (see AIR QUALITY Table 19) and 293 lbs/day of Priority Reserve PM10 Credit.

The District has determined that the ESPII must hold at least 331,365 lbs of NOx RTCs for the first year of operation. Each year of operation the District will re-evaluate the necessary amount of RTCs for the EI Segundo facility as a whole. The first year of operation includes emissions from initial commissioning as well as normal startups and expected operations. The ESPII has available to it NOx RTC allocations from the EI Segundo Facility in the amount of 268,693 lbs and will be required to transfer additional NOx RTCs that it has available from the Long Beach Generation Stations.

ADEQUACY OF PROPOSED MITIGATION

Construction Mitigation

Staff finds that the mitigation proposed for fugitive dust control is reasonable and will mitigate the impacts from fugitive dust to the extent feasible. However, staff finds that there are further mitigation measures possible for the control of combustion emissions from construction equipment. These additional mitigation measures are discussed in the Staff Proposed Mitigation section below.

Operations Mitigation

Emission Controls

The ESPII has proposed all practical and technically feasible mitigation measures to limit NOx emissions from the combustion turbines to 2.5 ppm over a 1-hour average. In addition, ESPII proposes to use an oxidizing catalyst to limit CO emissions to 6 ppm over a 1-hour period, which will also limit VOC emissions to 1.4 ppm over a 1-hour period.

Offsets

The emission reduction credits (ERCs) and RECLAIM trading credits (RTCs) identified in AIR QUALITY Tables 17 through 20 are intended to mitigate the ESPR air quality impacts. The amount of ERCs determined necessary for the ESPR (the ERC liability) is based on the daily average of the worst case month. In the case of ESPR this is most likely to be August. The directive from the District is to calculate the total expected monthly emissions from the ESPR for August and divide that total by 30 (days per month) to determine the daily average. These calculations will be shown in more detail in the "Compliance with LORS" section of this analysis.

The sources of the emission reduction credits have always been a concern for staff as it affects the ERC's ability to mitigate the project impacts. It is staff's opinion that the NOx RTCs are a valid mechanism to mitigate the ESPR NOx emissions due to the extensive monitoring and reporting requirement for the RECLAIM program. Since there are no violations of the SO2 ambient air quality standards, staff accepts the SO2 ERCs provided by the applicant for mitigating the ESP II project SO2 emission impacts. Staff also endorses the CO emission reductions from the boiler shutdown as contemporaneous and fully mitigating the ESP II CO emission impacts. Staff further recognizes the VOC ERCs as full mitigation for the ESP II VOC emission impacts on ozone formation in the Los Angeles Air Basin, based entirely on their inclusion in the State Implementation Plan.

Staff has reservations regarding the PM10 mitigation plan, but no specific objection to the current proposal (23 lbs/day of PM10 ERCs and 293 lbs/day of Priority Reserve PM10 Credits). It should be noted that the 23 lbs/day of ERCs purchased are not in the general vicinity of the ESP II project site or impacts. Staff has also had several conversations with the District and CARB in regards to the Priority Reserve PM10 Credits. These credits are surplus in that they are accounted for in the State Implementation Plan (starting in 1995). They were originally generated in 1990 as part of the District's buyout for an NSR Balance Program, which had been in place since 1975. The NSR Balance established an emission baseline for each facility in the Los Angeles Air Basin via fuel use and emission factors. A facility could then reduce its emissions through replacements, retrofits or other control measures and generate a negative balance. The emission factors were established in some cases by source tests, but more commonly by industry wide averages. In 1990, the negative NSR balances were converted into ERCs, 80% of which were sent to the District's Priority Reserve, the remainder returned to the facilities. Therefore, these credits are at least 12 years old and may be 25 years old; they may also be based on unreliable (by today's standards) emission monitoring practices.

It is the District's opinion that these credits satisfy the District offset requirements and staff is reasonably confident that the credits that are eventually issued will satisfy these requirements. However, staff is concerned that many of the Priority Reserve credits, by virtue of their age and origin, may represent only paper mitigation and thus might not, under closer inspection, mitigate the ESPR PM10 emission impacts or satisfy the District rule requirements. No further information on these credits is available at this time as the District has not been requested to issue Priority Reserve PM10 credits to the ESP II.

In AIR QUALITY Table 21 and 22, staff presents the balance of emissions and mitigation on an annual and daily basis, respectively. AIR QUALITY Tables 21 and 22 both show a final liability of PM10 and SOx emission impacts. This indicates that from a CEQA point of view the project has unmitigated emissions and thus unmitigated impacts. The District has based the offset requirements on District Rule 1304, which allows for only the mitigation of that portion of emissions that would represent the proportional increase in capacity at the facility. In this case, that portion of ESPR emissions that will be mitigated is approximately 45%. However, under the District's application of this rule, ESP II will not be allowed to count the emissions reduction from the shutdown of boiler units 1 and 2. Staff's analysis is intended to evaluate the project

emissions compared to the proposed mitigation and as such, cannot excuse any emission increase that may have the potential to cause a significant impact. Staff's analysis also considers all mitigation, including the shutdown of boiler units 1 and 2.

AIR QUALITY Table 21
Comparison of Expected Annual Emissions to Offsets Provided
(tons/year)

	Liability ¹	Historic Boiler Emissions ²	RTC Or ERC Procured ³	Final Liability
NOx	153	0	166	-13
CO	94	202	0	-108
VOC	32	13	20	-1
SOx	12	1	8	3
PM10	105	18	58	29
1 These emissions include only the CTGs and the fire water pump. 2 Based on emission reductions as reported by the District (SCAQMD 2000c). 3 Based on summary of current status of RTCs and ERCs (SCAQMD 2000c).				

AIR QUALITY Tables 21 and 22 show that the ESPR will emit 29 tons/year and 77 lbs/day of unmitigated PM10 emissions. These tables also show that the ESPR will have an excess of SOx emissions, 3 tons/year and 9 lbs/day respectively. It should be noted that the maximum PM10 emission impact is expected to occur within the Chevron Refinery located near the ESPR property. Although this is within an industrial facility, staff still considers this to be an exposure to the general public (in this case the employees of the Chevron Refinery). The unmitigated portions of the ESPR PM10 emission impacts are approximately 1.18 ug/m³ on a 24-hour average and 0.39 ug/m³ on an annual average (this 12.5% and 27.6% of the total impact respectively). While these impacts are small, they are in an area that already exceeds the 24-hour and annual PM10 ambient air quality standards. Thus, any additional PM10 emission impacts may cause additional health impacts and are considered significant if left unmitigated by CEQA standards.

The unmitigated SOx emissions shown in AIR QUALITY Tables 21 and 22 have a potential to contribute to secondary PM10 formation in Los Angeles Air Basin. Chemically, these SOx emissions are converted to sulfuric acid and then ammonium sulfate. The area is considered ammonia rich (a necessary component of this reaction) as explained in the Environmental Setting Section, therefore staff assumes that all the unmitigated SOx emissions will be converted to PM10. Staff considers this potential SOx emission impact to be significant if left unmitigated.

AIR QUALITY Table 22
Comparison of Expected Daily Emissions to Offsets Provided
(pounds/day)

	Daily Liability ¹	Historic Boiler Daily Emissions ²	RTC Or ERC Procured ³	Final Liability
NOx	1,155	0	908	248
CO	703	2,457	0	-1,754
VOC	230	161	109	-40
SOx	71	18	44	9
PM10	615	222	316	77

1 See AIR QUALITY Table 11

2 Based on emission factors consistent with emissions reported in RECLAIM from April 1999 to March 2001 (SCAQMD 2000c).

3 Based on summary of current status of RTCs and ERCs (SCAQMD 2000c).

Air Quality Table 22 shows a final liability of 248 lbs/day of NOx. The operating scenario under which this daily excess may occur is restricted to a short-term duration in which the turbines employ the power augmentation and duct burners. That is expected to be no more than 2099 hours per year (less than a quarter of the year) and no more than 15 hours in a single day. The RECLAIM program essentially allows an emission source to operate as they see fit during the year so long as they have sufficient RTCs (and that they do not use all their RTCs in one quarter). Since the ESPR will be monitoring NOx emissions in-stack, it is unlikely, in staff's opinion, that the ESPR will exceed its RTC allocation and therefore unlikely that the ESPR will emit unmitigated NOx emissions.

STAFF PROPOSED MITIGATION

Construction Mitigation

The modeling assessment discussed earlier shows that the combustion sources used for heavy construction have the potential for causing significant air quality impacts. Staff has determined that a viable alternative to the use of 1996 CARB certified low emission diesel engines in conjunction with ultra-low sulfur content diesel fuel (<15 ppm) is the use of catalyzed diesel particulate filters on all heavy diesel powered construction equipment. Staff proposes Conditions of Certification AQ-C1 through AQ-C4 to be considered with these mitigation measures.

Operational Mitigation

District rule 1304 encourages the replacement of older boiler-based power plants with modern gas turbines. In doing so, the District can expect that any increase in capacity at the facility from this replacement will be coupled with a decrease in NOx, CO and VOC emissions, due primarily to modern post combustion controls. However, PM10 and SOx emissions are not controlled in this fashion. It is an unfortunate consequence that these emissions are more likely to have a net increase from the implementation of this rule. As a result of the ESPR project, staff has determined that there will be a net increase in PM10 and SOx emissions that have not been mitigated by compliance with

District LORS. As indicated above (AIR QUALITY Tables 21 and 22), the ESPR will emit 29 tons/year and 77 lbs/day of unmitigated PM10 emissions and 3 tons/year and 9 lbs/day of unmitigated SOx emissions. These unmitigated emissions will have an approximate impact of 1.18 ug/m³ (24-hour average) and 0.39 ug/m³ (annual average) at the point of maximum impact, which is located in the nearby Chevron Refinery.

These unmitigated emissions will also impact the 683,654 residents living within 6 miles of the ESPR project. The residents most significantly impacted would be those that reside in the City of Manhattan Beach (population of 33,852) and the City of Hawthorne (population of 84,112). These residents are currently impacted by the significant amount of industrial activities in this coastal area. Some of these industries include the AES Redondo Beach Generating Station, the Chevron Refinery, the LADWP Scattergood Generating Station, and LAX. These populations are also subjected to air pollution from the mobile emissions associated with these and other, industries located in this area. Some of these sources include trucks, trains, marina activities, airplanes, ground support, automotive and industrial equipment activities (such as employee commuters, deliveries, construction, demolition and handling operations). All of these sources contribute to the background ambient air PM10 concentrations (see AIR QUALITY Figures 9 and 10). These PM10 concentrations measured at Hawthorne have exceeded the California PM10 ambient air quality standards ever since records of these emissions have been kept. In fact, only one ambient air quality monitoring station in the South Coast air basin has ever demonstrated compliance with the California PM10 ambient air quality standards (Lake Gregory). The District does not currently have an attainment plan to comply with the California PM10 ambient air quality standards and is not required to develop one, only to make reasonable progress. Therefore, staff considers the contribution from ESPR to the on-going exceedance of the California PM10 ambient air quality standards to be significant to the health and safety of the workers of the Chevron Refinery, the citizens of the City of Manhattan Beach and the citizens of the City of Hawthorne.

In calculating the necessary additional mitigation, staff is taking into consideration the common unit (lbs/day) that the District uses to determine and mitigate project offset liabilities. However, the District method of calculating the project offset liability in terms of lbs/day can result in a short fall in terms of the annual offset liability. The District determines offset liability by averaging the maximum monthly emissions (SOx, CO, VOC and PM10) over 30 days (NOx is done on an annual basis in RECLAIM). The maximum monthly emissions are determined by the District based on the project-stated operational intentions. In the case of most power plants, this month is August. The total emissions are summed for the month and divided by 30 (days) to generate a lbs/day liability. A similar procedure is used for all ERCs and Priority Reserve Credits prior to their banking.

In using this methodology, the District is focusing on the short-term (hourly or daily) impacts, thus long-term (annual) impacts can sometimes be not fully mitigated. In most cases, these long-term impacts are more than compensated for with the offset ratio imposed by the District (1.2:1 in most cases). These offset ratios are one mechanism that the District uses to improve ambient air quality. As such, the Commission has determined that, for a CEQA assessment, it is not necessary to include these ratios. It is the Commission's interpretation that CEQA is not responsible for improving the

ambient air quality, but only for not making it worse. Therefore, the Commission reduces the offset ratio imposed by the District to 1:1 when performing a CEQA assessment. Thus in most cases this additional mitigation (the difference of 1.2:1 and 1.0:1) is enough to mitigate the project impacts on both a short-term and long-term basis in a CEQA assessment.

ESP II is proposing to use the PM10 Priority Reserve at this time. The District owns these credits and their use is not subject to the normal offset ratio of 1.2:1. Instead, the District uses an offset ratio of 1:1. This, coupled with the implementation of rule 1304, means that mitigating to the shortfall of 77 lbs/day of PM10 (see AIR QUALITY Table 22) will not be sufficient to mitigate the annual shortfall of 29 tons/year of PM10. That is, 77 lbs/day times 365 days/year divided by 2000 lbs/ton is only 14.4 tons/year. Therefore, staff recommends that ESP II mitigate the annual short fall in terms of lbs/day. Staff recommends that ESP II provide an additional 158 lbs/day of PM10 emission reduction and an additional 16 lbs/day of SO₂ emission reduction. It is staff's opinion that this amount of additional mitigation would reduce the ESPR emission liabilities to zero, thus eliminating the remaining significant air quality impact from PM10 emissions.

Staff has investigated the feasibility of several potential sources of PM10 mitigation for the ESPR. Staff found several tug operators at the Chevron refinery, one of which has been contacted and is interested in retrofitting new engines into their existing vessels. The vessel has an engine size of 850 bhp and operates for 394 hours out of 720 hours per month in the vicinity of the ESPR. Based on this information and average emission factor for diesel engines, staff estimated the emission savings to be approximately 25 lbs/day of PM10 emissions and 4 lbs/day of SO₂ emissions. If the entire operation of the tug were taken into consideration instead of just the operation in the vicinity of the ESPR, then the approximate savings would be 50 lbs/day of PM10 emissions and 8 lbs/day of SO₂ emissions. Thus, staff estimates that approximately 3 such retrofits would be required to mitigate the ESPR PM10 and SO₂ emissions entirely. Based on the District tugboat retrofit program, staff estimates that these retrofits take on the order of several months to complete but have taken longer in several cases due to unforeseen, necessary hull redesigns for buoyancy. The cost of these retrofits has ranged from \$92,000 to \$352,426 (or 1,840 to 7,048 dollars per lbs/day), but may be defrayed in this case from the potential sale of NO_x RECLAIM trading credits which staff would not need for mitigation purposes for the ESPR. Based on the District program for tugboat retrofits, there seem to be no legal, social or technical barriers that cannot be overcome. Therefore, staff recommends that the ESP II fully investigate this source of emission reductions to mitigate the ESPR PM10 and SO₂ emission impacts.

COMPLIANCE WITH LORS

FEDERAL

The District has not yet issued a Final Prevention of Significant Deterioration (PSD) permit as part of their Determination of Compliance for the ESPR. The Final Determination of Compliance, issued January 14, 2002 is expected to serve as the

basis for the PSD permit for this project. The Permit to Construct will be issue after the Commission Decision is finalized.

STATE

ESP II will demonstrate that the ESPR will comply with Section 41700 of the California State Health and Safety Code with the District Final Determination of Compliance (issued January 14, 2002) and the CEC staff's affirmative finding for the project.

LOCAL

Compliance with specific SCAQMD rules and regulations is discussed below. For a more detailed discussion of the compliance of the El Segundo project, please refer to the Final Determination of Compliance (SCAQMD 2002c).

Regulation II – Permits

Rule 218 – Continuous Emission Monitoring

The ESPR will be required to install a CO CEMS to verify emissions of CO meet the hourly and daily emission limits. The CO CEMS will need to comply with the requirements of Rule 218, and the facility will need to submit a CEMS application for District review and approval prior to installing the CEMS. (Continuous monitoring for NOx emissions is required under the RECLAIM and acid rain regulations, discussed further below.)

Regulation IV – Prohibitions

This regulation sets forth the restrictions for visible emissions, odor nuisance, fugitive dust, various air emissions, fuel contaminants, start-up/shutdown exemptions and breakdown events.

Rule 401 – Visible Emissions

Visible emissions are not expected under normal operating conditions of the turbines.

Rule 402 – Nuisance

Nuisance problems are not expected under normal operating conditions of the turbines.

Rule 403 – Fugitive Dust

The ESPII will submit a fugitive dust plan to both the District and the Commission.

Rule 407 – Liquid and Gaseous Air Contaminants

This rule limits the CO emissions to 2000 ppm max, and the sulfur content of the exhaust to 500 ppm for equipment not subject to the emission concentration limits of 431.1. Since the turbines are subject to the limits of Rule 431.1, only the 2000 ppm limit of this rule applies. It is expected that the equipment will be able to meet the CO limit with the use of an oxidation catalyst. Compliance will be verified through CEMS data.

Rule 409 – Combustion Contaminants

Limits PM emissions to 0.1 gr/scf. The equipment is expected to meet this limit based on the calculations shown below:

$$\begin{array}{rcl} \text{Estimated exhaust gas} & & 60 \text{ mmscf/hr} \\ \\ \text{Grain loading} & = & \frac{(11 \text{ lbs/hr}) \times (7000 \text{ gr/lb})}{60 \text{ E}+06 \text{ scf/hr}} \\ & = & 0.00128 \text{ gr/scf} \end{array}$$

Compliance will be verified through the initial performance test as well as periodic testing as required by Title V.

Rule 431.1 – Sulfur Content of Gaseous Fuels

The rule requires that gas fired equipment meet a sulfur content limit of 40 ppm over a 4 hour averaging time. Commercial grade natural gas to be burned in the turbines is expected to meet this limit.

Rule 431.2 – Sulfur Content of Liquid Fuels

This rule establishes a sulfur content limit for diesel fuel of 0.05 percent by weight, as well as record keeping requirements and test methods. The project owner shall not use fuel oil containing sulfur compounds in excess of 0.05 percent by weight.

Rule 475 – Electric Power Generating Equipment

This rule applies to power generating equipment greater than 10 MW installed after May 7, 1976. Requirements are that the equipment meet a limit for combustion contaminants (combustion contaminants are defined as particulate matter in AQMD Regulation I) of 11 lbs/hr or 0.01 gr/scf. Compliance is achieved if either the mass limit or the concentration limit is met. Mass PM10 emissions from the project turbines are estimated at 11 lbs/hr. However, on a concentration basis estimated grain loading is 0.00128 gr/scf (see calculations under Rule 409 discussion). Therefore, compliance is expected. Compliance will be verified through the initial performance test as well as periodic testing required by Title V.

Regulation IX – Standards of Performance for New Stationary Sources

Regulation IX incorporates provisions of Part 60, Chapter I, Title 40, of the Code of Federal Regulations (CFR) and is applicable to all new, modified or reconstructed sources of air pollution. Sections of this regulation apply to electric utility steam generators (Subpart Da) and stationary gas turbines (Subpart GG). These subparts establish limits of particulate matter, SO₂ and NO₂ emissions from the facility as well as monitoring and test method requirements. The ESPR is expected to surpass these emission limits with the controls proposed.

Regulation XIII – New Source Review

This regulation sets forth the pre-construction review requirements for new, modified or relocated facilities to ensure that these facilities do not interfere with progress in attainment of the national ambient air quality standards and that future economic growth in the SCAQMD is not unnecessarily restricted. This regulation limits the emissions of non-attainment contaminants and their precursors as well as ozone depleting compounds (ODC) and ammonia by requiring the use of Best Available Control Technologies (BACT). However, this regulation does not apply to NOx emissions from the ESPR project, which are regulated by Regulation XX (RECLAIM). The ESPII has complied with all requirements of the Regulation.

Regulation XVII – Prevention of Significant Deterioration

This regulation sets forth the pre-construction requirement for stationary sources to ensure that the air quality in clean air areas does not significantly deteriorate while maintaining a margin for future industrial growth. This regulation establishes maximum allowable increases over ambient baseline concentrations for each pollutant. It is likely that the ESPR will trigger PSD for NOx only. The PSD permit will be issued by the District as part of the Final Determination of Compliance.

Regulation XX – Regional Clean Air Incentives Market (RECLAIM)

The Regional Clean Air Incentives Market (RECLAIM) program is designed to allow facilities flexibility in achieving emission reduction requirements for NOx and SOx through controls, equipment modifications, reformulated products, operational changes, shutdowns, other reasonable mitigation measures or the purchase of excess emission reductions. The RECLAIM program establishes an initial allocation (beginning in 1994) and an ending allocation (to be attained by the year 2003) for each facility within the program (Rule 2002). Each facility then reduces its allocation annually on a straight line from the initial to the ending. The RECLAIM program supercedes other district rules, where there are conflicts. As a result, the RECLAIM program has its own rules for permitting, reporting, monitoring (including CEM), record keeping, variances, breakdowns and the New Source Review program, which incorporates BACT requirements (Rules 2004, 2005, 2006 and 2012). RECLAIM also has its own banking rule, RECLAIM Trading Credits (RTCs), which is established in Rule 2007. The ESPR is exempt from the SOx RECLAIM program (Rule 2011) because it uses natural gas exclusively (per Rule 2001). However, it will be a NOx RECLAIM project and therefore subject to the rules of RECLAIM for NOx emissions. The ESPII has complied with all aspects of the RECLAIM Regulation.

Regulation XXX – Title V Permits

The Title V federal program is the air pollution control permit system required by the federal Clean Air Act as amended in 1990. Regulation XXX defines the permit application and issuance as well as compliance requirements associated with the program. Any new or modified major source which qualifies as a Title V facility must obtain a Title V permit prior to construction, operation or modification of that source. Regulation XXX also integrates the Title V permit with the RECLAIM program such that a project cannot proceed without compliance of both regulations. The District will issue the Title V permit as part of the Permit to Construct.

Regulation XXXI – Acid Rain Permits

Title IV of the federal Clean Air Act provides for the issuance of acid rain permits for qualifying facilities. Regulation XXXI integrates the Title V program with the RECLAIM program. Regulation XXXI requires a subject facility to obtain emission allowances for SO_x emissions as well as monitoring SO_x, NO_x and CO₂ emissions from the facility. It is expected that ESPR will comply with the monitoring requirements of the acid rain provisions with the use of gas meters in conjunction with gas analysis.

RESPONSE TO COMMENTS

Staff received two comments on the Air Quality section of the Staff Assessment released on June 15, 2001. The first comment from Dr. Linhardt pertains to the ability of the NO_x CEM to measure very low NO_x concentrations expected from the facility given the ambient air conditions. Staff responds by showing that the SCR and CEM are exposed to much higher NO_x concentrations than are present in the ambient air, and that CEMs have been used successfully to measure very low concentrations of NO_x emissions and are considered to be reliable and accurate if maintained properly. The Second comment from Mr. Joe Lyou ultimately resulted in revisiting the Cumulative Impacts Assessment, revising the results and changing the basic procedure by which Staff will perform future Cumulative Impacts Assessments. The written staff responses to both comments are included in the remainder of this section as they were originally transmitted to each commentor.

Staff Response to Comment 1:

Dr. H.D. Linhardt PE, writes on 4/18/01, How can you measure 2-3 ppm of NO_x close to Chevron Refinery and LAX?

NO_x emissions will be measured in the power plant exhaust stack approximately every 15 seconds. This information is recorded and used to determine the 1-hour average, which will be compared to the emission limit for the facility. The actual devices used to measure the NO_x concentrations in the stack have not been explicitly identified at this time. However, in-stack monitoring devices have been used successfully to measure very low concentrations of NO_x emissions and are considered to be reliable and accurate if maintained properly.

The relatively close proximity of LAX and the Chevron Refinery (and several other major sources) will not have a significant effect on the accuracy or reliability of the in-stack monitor. These local emission sources contribute to the NO₂ background concentrations of the intake air for the proposed combustion turbines. The background NO₂ concentrations in the area of the proposed project range from 0.007 to 0.13, with an annual average of 0.0295 ppm @ 15% O₂ (measured at the Hawthorne Monitoring Station). The expected NO₂ emissions from the combustion chamber (prior to emission controls) is approximately 9.0 ppm @ 15% O₂. The power plant also includes a natural gas fired heat recovery steam generator (HRSG) that acts as a boiler in addition to recovering useful work from the waste heat of the turbines. The NO₂ emissions from the HRSG are approximately 11 to 14 ppm @ 15% O₂. The selective catalytic reduction device (SCR), with ammonia injection, will control NO₂ emissions from the power plant from approximately 20 ppm to below 2.0 ppm @ 15% O₂. Therefore, it is unlikely that

ambient NO₂ concentrations will have any significant effect on the emission, control or measurement of NO₂ from the proposed power plant.

Staff Response to Comment 2:

Response to public comment from Mr. Joe Lyou Director of Programs for the California League of Conservation Voters Education Fund January 6, 2002.

I have received a comment letter regarding the El Segundo Redevelopment Project located in the City of El Segundo from Mr. Joe Lyou, the Director of Programs for the California League of Conservation Voters Education Fund. It is my intention with this memo to paraphrase Mr. Lyou's comments and respond to those comments that are germane to the air quality CEQA assessment, which I am responsible for completing.

Mr. Lyou's chief concern is that the applicant for the El Segundo Redevelopment Project did not perform any cumulative environmental impact analysis, which should include the planned modifications to operations at the Chevron refinery located in close proximity to the power plant. Mr. Lyou has provided with his comments, the Notice of Preparation of a Draft Environmental Impact Report for the Chevron Refinery. I have reviewed Mr. Lyou's comments and the Notice of Draft EIR provided.

I wish to point out that, based on other comments by Mr. Lyou which will be called out herein, Mr. Lyou may not be aware that the applicant has performed a cumulative analysis for the El Segundo Redevelopment Project. The cumulative analysis was discussed in the Staff Assessment issued for this project. For the cumulative impacts analysis, the applicant requested information on any new projects within 6-miles of the El Segundo Redevelopment Project from the South Coast Air Quality Management District (District). The request asked for any new sources and any new modifications to existing sources. The response from the District stated that there were no new sources seeking a permit (submitting an application) with the District. However, several existing sources were identified as making major modifications. These sources included the Redondo Beach Power Plant, the Scattergood Power Plant, the Los Angeles International Airport and the Chevron Refinery. After further investigation at the District, I found that these sources were reducing emissions, not increasing them (which would still require a permit modification on their part). The Redondo Beach, Scattergood and LAX sources were reducing emissions through added emissions control technologies. The Chevron Refinery was reducing emissions from one of its cracking units. Therefore, in staff's opinion the cumulative analysis of these considered sources would result in a net decrease in emissions impacts. It is therefore staff's preference that the project direct impacts (which would be higher) stand as a conservative estimate of the project cumulative impacts.

In reviewing the Notice of Preparation of the Draft EIR for the Chevron Refinery provided by Mr. Lyou, on page 3-7 Section 3 of the checklist, staff notes that the following three items are checked as "Potentially Significant Impacts."

Would the Project:

1. Violate any air quality standard or contribute to an existing or project air quality violation?

2. Result in a cumulative considerable net increase of any criteria pollutant for the project region is non-attainment ...?
3. Expose sensitive receptors to substantial pollutant concentrations?

The Notice qualitatively discusses the potential emissions from planned construction activities (temporary increases in NO_x, SO_x, CO, VOC and PM₁₀) which are not generally considered in cumulative analyses. The Notice also qualitatively discusses the potential operational emissions from the planned refinery modifications, which appear to be restricted to increases in VOCs and toxic air contaminants. There is, as yet, no federal or state ambient air quality standard for VOC concentrations, therefore VOC emissions are not considered in the cumulative analysis. Toxic emission impacts are addressed in the Public Health section of the Staff Assessment. A cumulative air toxic impacts analysis was performed and is available on-line in the Public Health section of the Staff Assessment.

Mr. Lyou asks if consideration of the potential emissions from the Chevron refinery would have rendered the project application "data inadequate." Under the 12-month licensing process, the Commission accepts a "cumulative analysis protocol" for data adequacy purposes. Under the 12-month process staff has a substantial amount of time to review, control and verify results of the cumulative analysis. Therefore, staff would not recommend, and the Commission has never found, that a 12-month power project should be "data inadequate" due to the lack of a cumulative analysis. However, it should be noted that the applicant would not be granted a license without a cumulative analysis, reviewed by staff in the final assessment.

Mr. Lyou asks if consideration of the potential emissions from the Chevron refinery would affect the Districts intention to issue a permit at the end of the public comment period. It may be more appropriate for the District to respond to this particular comment, however, staff can relate past experience with this District as to their process for issuing a power plant permit. The District is required to issue a Final Determination of Compliance, which indicates how the District expects the applicant will comply with all applicable District rules and regulations. This FDOC is not a permit. The District can not issue a Permit to Construct prior to the issuance of the Final Commission Decision (via their rules and regs). It may also be important for Mr. Lyou to understand that the Commission is the CEQA Lead Agency in this case, not the District. As such, the project can not begin until the Commission has granted the applicant their license.

Mr. Lyou makes several further comments regarding the availability of critical documents to the general public. It is not appropriate for the air quality staff to respond to these particular comments.

SUBSEQUENT STAFF RESPONSE:

Subsequent to the above staff response to Mr. Lyou's comments being released, staff made further investigations into the Chevron Refinery Clean Fuels Project. Staff found the Final Environmental Impact Report for the Chevron El Segundo Refinery CARB Phase 3 Cleans Fuels Project dated November 2001(EIR) (SCAQMD 2001e) on the District Web Site. The EIR identified increases in PM₁₀, CO and SO₂ emissions as a result of modified equipment for the project. The EIR recommend overriding

considerations for the impacts from these emissions, thus these emission impacts were never fully mitigated.

In staff's opinion only the PM10 emissions have the potential to contribute to a cumulative impact. In staff's opinion, it is unlikely that the unmitigated CO emissions will contribute to an exceedance of the CO ambient air quality standards given that the local background measurement is approximately 50% of the ambient air quality standards (for all averaging periods). The SO2 emissions have the potential to contribute to secondary PM10 emission impacts (see setting section for more details on secondary PM10 formation). In staff's opinion, there is no reliable method to determine the impact (even approximately) of the SO2 emissions on secondary PM10 formation. Chemically, these SO2 emissions are converted to sulfuric acid and then ammonium sulfate. The area is considered ammonia rich (a necessary component of this reaction) as explained in the Environmental Setting Section. Since the area is considered ammonia rich it is reasonable to assume that all the SO2 will eventually be converted to ammonium sulfate. In staff's opinion, it is therefore possible that SO2 emissions from the Chevron Refinery could contribute to exceedances of the PM10 24-hour and annual ambient air quality standards. Therefore, if the Chevron Refinery were under the Commission jurisdiction staff would consider this potential SO2 emission impact to be significant if left unmitigated.

The maximum PM10 impacts for the ESP II facility, shown in AIR QUALITY Table 16, occur inside the facility boundaries of the Chevron Refinery. According to the EIR for the changes at the Chevron Refinery, the maximum impacts from the new Chevron emissions also occur within the facility boundaries. It is therefore reasonably foreseeable in staff's opinion that these two maximum impacts could coincide. The maximum PM10 impact from the Chevron Refinery is 1.98 ug/m³ averaged over 24-hours, and 0.43 ug/m³ averaged over a year. Adding these impacts to the expected ESP II impacts and the background ambient air quality yields a cumulative impact of 80.4 ug/m³ averaged over 24-hours (or 161% of the standard) and 35.6 ug/m³ averaged over a year (or 120% of the standard). If left unmitigated, staff would consider the ESP II contribution to this cumulative impact significant.

CONCLUSIONS AND RECOMMENDATIONS

The ESPR's emissions of NOx, SO2 and CO will not cause or contribute to a violation of any NO2, SO2 or CO ambient air quality standards, and therefore, these direct impacts are not significant. The project's air quality impacts from the ozone precursor emissions of NOx and VOC could be significant if left unmitigated. ESPII will reduce emissions by providing emission offsets for NOx and VOC emissions, and thus reduce the potential for ozone formation. However, ESPR's potential for direct, cumulative and secondary impacts on PM10 ambient air quality conditions have not been mitigated to a level of insignificance. ESPR's emissions of PM10 and SO2 are not fully mitigated and thus can be expected to cause or contribute to a new violation of the 24-hour PM10 standards (both federal and state) if left unmitigated.

The District has submitted a Final Determination of Compliance (SCAQMD 2002c) that concludes that the ESPR will comply with all applicable District rules and regulations

and therefore has proposed a set of conditions presented here as staff recommended Conditions of Certification AQ-1 through AQ-30. Staff also recommends the inclusion of Conditions of Certification AQ-C1 through AQ-C4 that address construction related impacts.

Staff cannot recommend approval of the certification of the ESPR until the ESP II provides adequate mitigation for PM10 (158 lbs/day) and SOx (16 lbs/day) emission impacts as identified in this analysis.

CONDITIONS OF CERTIFICATION

The Conditions of Certification (**AQ-C1** through **AQ-C4**) that are separate from the conditions incorporated from the FDOC have been updated from the PSA based on staff's efforts to standardize Conditions of Certification to the extent feasible based on recent experience in the certification and compliance process. These changes do not affect the substance of the requirements in the Condition, and the modified Conditions are supported by the analysis outlined in the text above.

In addition, minor changes have been made to the Conditions of Certification incorporated based on the SCAQMD Determination of Compliance to reflect the changes that occurred to the SCAQMD Conditions after the issuance of the PDOC and as reflected in the FDOC. For these changes, deletions are indicated by ~~strikethrough~~ and additions are indicated by **bolding**.

AQ-C1The project owner shall submit the resume(s) of their selected Construction Mitigation Manager(s) (CMM) to the CPM for approval. The CMM shall preferably have a minimum of 8 years experience as follows, however the CPM will consider all resumes submitted regardless of experience:

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

The project owner shall make available a dedicated office for the CMM. The CMM shall be responsible for implementing all mitigation measures related to construction, as outlined in Conditions of Certification for construction AQ-C1 through AQ-C4. The CMM shall be on-site or available to be on-site at any time. The CMM will be granted access to all areas of the main and related linear facility construction sites. The CMM shall have the authority to stop construction on either the main or the related linear facility construction sites as warranted by specific mitigation measures. The CMM may not be terminated prior to the cessation of all construction activities unless written approval is granted by the CPM.

Verification: The project owner shall submit the CMM resume at least 60 days prior to site mobilization.

AQ-C2The CMM shall prepare and submit for approval to the CPM, a Fugitive Dust Mitigation Plan that will specifically identify fugitive dust mitigation measures that will be employed during the construction phase of the main and related linear construction sites. The CMM will be responsible for implementing and maintaining all measure identified in the Fugitive Dust Mitigation Plan. The Fugitive Dust Mitigation Plan must address at a minimum the following:

- the identification of the employee parking area(s) and surface of the parking area(s);
- the frequency of watering of unpaved roads;
- the application of chemical dust suppressants;
- the use of gravel in high traffic areas;
- the use of paved access aprons;
- the use of sandbags to prevent run off;
- the use of posted speed limit signs;
- the use of wheel washing areas prior to large trucks leaving the project site;
- the methods that will be used to clean tracked-out mud and dirt from the project site onto public roads;
- for any transportation of borrowed fill material,
- the use of vehicle covers;
- the use of wetting of the transported material;
- the use of appropriate freeboard;
- the method for the stabilization of storage piles and disturbed areas;
- the use of windbreaks at appropriate locations;
- the suspension of all earth moving activities under windy conditions;
- and,
- the use of on-site monitoring devices.

Verification: The CMM shall submit the Fugitive Dust Mitigation Plan to the CPM for approval at least 30 days prior to site mobilization.

AQ-C3The CMM shall prepare and submit a Diesel Construction Equipment Mitigation Plan that will specifically identify diesel engine mitigation measures that will be employed during the construction phase of the main and related linear construction sites. The CMM will be responsible for implementing and maintaining all measure identified in the Diesel Construction Equipment Mitigation Plan. The Diesel Construction Equipment Mitigation Plan will address the following mitigation measures:

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

The Diesel Construction Equipment Mitigation Plan must include the following:

1. A list of all diesel-fueled, off-road, stationary or portable construction-related equipment to be used either on the main or the related linear construction sites. This list will be initial estimated and then subsequently

updated, as specific contractors become available. Prior to a contractor gaining access to the main or related linear construction sites, the CMM will submit to the CPM for approval, an update of this list with regard to that contractor's diesel construction equipment.

2. Each piece of construction equipment listed under item (1) must demonstrate compliance by the following mitigation requirements with the exceptions described in items (3), (4) and (5):

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

3. If the construction equipment is intended to be on-site for 10 days or less, then no mitigation measures identified in item (2) are required.
4. The CPM may grant relief from the mitigation measures listed under item (2) for a specific piece of equipment if the CMM can demonstrate that they have made a good faith effort to comply with said mitigation measures and that compliance is otherwise not possible.
5. Any implemented mitigation measure in item (2) may be terminated immediately if one of the following conditions exists, however the CPM must be informed within 10 working days of the termination:
 - a) The measure is excessively reducing normal availability of the construction equipment due to increased downtime for maintenance, and/or power output due to an excessive increase in back pressure.
 - b) The measure is causing or is reasonably expected to cause significant engine damage.
 - c) The measure is causing or is reasonably expected to cause a significant risk to nearby workers or the public.
 - d) Any other seriously detrimental cause which has approval by the CPM prior to the termination being implemented.
 - e) All contractors must agree to limit diesel engine idle time on all diesel-powered equipment, to the extent practical, to no more than 10 minutes.

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

AQ-C4The CMM will submit to the CPM for approval, the Monthly Construction Compliance Report that will summarize all compliance actions taken germane to Conditions of Certification AQ-C2 and AQ-C3. The Monthly Construction Compliance Report will include the following elements:

Fugitive Dust Mitigation Monthly Report (see Condition of Certification AQ-C2)

- Identification of each mitigation measure approved by the CPM.
- Identification of specific mitigation measure performed, the location performed, date performed and date enforced or verified as remaining effective.
- Identification of any transgressions or circumventions of mitigation measure and the actions taken to correct the situation.
- Identification of any observation by the CMM of dust plumes beyond the property boundary of the main construction site or beyond an acceptable distance from the linear construction site and what actions (if any) were taken to abate the plume.

Diesel Construction Equipment Mitigation Monthly Report (see Condition of Certification AQ-C3)

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

from the linear construction site and what actions (if any) were taken to abate the plume or future expected plumes.

Verification: The CMM shall submit to the CPM for approval, the Monthly Construction Compliance Report by the 10th day of each month while construction is occurring at the main or related linear construction sites.

Conditions of Certification AQ-1 through AQ-27, below, pertain to the following equipment:

1. 1,896 MMBTU/HR Gas Turbine (ID No. D46) (A/N 378766) No. 5 GE Model 7241FA with Dry Low NOx combustors and steam injection for power augmentation connected directly to a 179 MW (nominal) Electric Generator (ID No. B47) and a Heat Recovery Steam Generator (ID No. B49) with 600 MMBTU/HR Duct Burners (ID No. D48) connected in common with Gas Turbine No. 7 to a 288 MW (nominal) steam turbine (ID No. B50). Selective Catalytic Reduction (ID No. C52) (A/N 378771) with 4379 cubic feet of total volume 3 feet height, 44 feet long, 41 feet wide with an ammonia injection grid (ID No. B53) and a CO oxidation catalyst (ID No. C51) with 1000 cubic feet of total volume connected to an exhaust stack (ID No. S54) (A/N 378771) No 5.
2. 1,896 MMBTU/HR Gas Turbine (ID No. D55) (A/N 378767) No. 7 GE Model 7241FA with Dry Low NOx combustors and steam injection for power augmentation connected directly to a 179 MW (nominal) Electric Generator (ID No. B56) and a Heat Recovery Steam Generator (ID No. B58) with 600 MMBTU/HR Duct Burners (ID No. D57) connected in common with Gas Turbine No. 5 to a 288 MW (nominal) steam turbine (ID No. B59). Selective Catalytic Reduction (ID No. C61) (A/N 378773) with 4379 cubic feet of total volume 3 feet height, 44 feet long, 41 feet wide with an ammonia injection grid (ID No. B62) and a CO oxidation catalyst (ID No. C60) with 1000 cubic feet of total volume connected to an exhaust stack (ID No. S63) (A/N 378773) No 7.

AQ-1 The operator shall not operate at the El Segundo Power Generation facility combined cycle turbines No. 5 and No. 7 unless prior to the initial operation, the operator demonstrates to the Executive Officer that the facility holds RTCs in the amount of 297,651 lbs for the initial compliance year.

Verification: The project owner shall submit to the CPM copies of all RECLAIM reports filed with the District in each Quarterly Operational Report (see **AQ-9**).

Condition of Certification AQ-1 was included in the SA based on the PDOC. The District has dropped this condition in the FDOC, stating that Condition of Certification 296-1 (AQ-27) is adequate to ensure compliance with Rule 2005. Staff has no objection.

AQ-2 The operator shall install and maintain a flow meter to accurately indicate the flow rate of the total hourly throughput of injected ammonia (NH₃) to the SCR in combined cycle turbines 5 and 7. The operator shall also install and maintain a device to continuously record the parameter being measured. The measuring device or gauge shall be accurate to within plus or minus 5 percent. It shall be calibrated once every twelve months.

Verification: The project owner shall make the site available for inspection by representatives of the District, California Air Resources Board (CARB), the United States Environmental Protection Agency (EPA) and the California Energy Commission (Commission).

AQ-3 The operator shall install and maintain a temperature gauge to accurately indicate the temperature in the exhaust at the inlet to the SCR reactor in combined cycle turbines 5 and 7. The operator shall also install and maintain a device to continuously record the parameter being measured. The measuring device or gauge shall be accurate to within plus or minus 5 percent. It shall be calibrated once every twelve months.

Verification: The project owner shall make the site available for inspection by representatives of the District, California Air Resources Board (CARB), the United States Environmental Protection Agency (EPA) and the California Energy Commission (Commission).

AQ-4 The operator shall install and maintain a pressure gauge to accurately indicate the differential pressure across the SCR catalyst bed in inches water column in combine cycle turbines 5 and 7. The operator shall also install and maintain a device to continuously record the parameter being measured. The measuring device or gauge shall be accurate to within plus or minus 5 percent. It shall be calibrated once every twelve months.

Verification: The project owner shall make the site available for inspection by representatives of the District, California Air Resources Board (CARB), the United States Environmental Protection Agency (EPA) and the California Energy Commission (Commission).

AQ-5 The operator shall conduct source test(s) for the pollutant(s) identified below.

Pollutants to be Tested	Test Method	Averaging Time	Test Location
NH3 Emissions	District Method 207.1 and 5.3 or EPA Method 17	1 hour	Outlet of SCR serving this equipment

The test shall be conducted at least quarterly during the first twelve months of operation and at least annually thereafter. The NOx concentration, as determined by the CEMS, shall be simultaneously recorded during the ammonia slip test. If the CEMS is inoperable, a test shall be conducted to determine the NOx emissions using District Method 100.1 measured over a 60 minute averaging time period.

Verification: The project owner shall submit the proposed protocol for the source tests 60 days prior to the proposed source test date to both the District and CPM for approval. The project owner shall notify the District and CPM no later than 7 days prior to the proposed source test date and time. The project owner shall submit source test results no later than 45 days following the source test date to both the District and CPM.

AQ-6 The operator shall conduct source test(s) for the pollutant(s) identified below on combined-cycle turbine units 5 and 7.

Pollutants To be Tested	Required Test Method	Averaging Time	Test Location
NOx Emissions	District Method 100.1	1 hour	Outlet of SCR serving this equipment
CO Emissions	District Method 100.1	1 hour	Outlet of SCR serving this equipment
SOx Emissions	Approved District & CPM Method	1 hour	Outlet of SCR serving this equipment
ROG Emissions	Approved District Method	1 hour	Outlet of SCR serving this equipment
PM Emissions	Approved District & CPM Method	1 hour	Outlet of SCR serving this equipment
NH3 Emissions	District Method 207.1 and 5.3 or EPA Method 17	1 hour	Outlet of SCR serving this equipment

The test shall be conducted after District and CPM approval of the source test protocol, but no later than 180 days after initial start-up.

The test shall be conducted to determine the oxygen levels in the exhaust. In addition, the tests shall measure the fuel flow rate (CFH), the flue gas flow rate, and the turbine and steam turbine generating output in MW.

The test shall be conducted in accordance with a District and CPM approved source test protocol. The protocol shall be approved by the District and CEC before the test commences. The test protocol shall include the proposed operating conditions of the turbine during the tests, the identity of the testing lab, a statement from the testing lab certifying that it meets the criteria of District Rule 304, and a description of all sampling and analytical procedures.

The test shall be conducted **with and without duct firing**, when this equipment is operating at loads of 100, 75, and 50 percent of maximum load.

Verification: The project owner shall submit the proposed protocol for the initial source tests 45 days prior to the proposed source test date to both the District and CPM for approval. The project owner shall submit source test results no later than 60 days following the source test date to both the District and CPM. The project owner shall notify the District and CPM no later than 10 days prior to the proposed initial source test date and time.

AQ-7 The operator shall conduct source test(s) for the pollutant(s) identified below on combine cycle turbine units 5 and 7.

Pollutants to be Tested	Required Test Method	Averaging Time	Test Location
SOx Emissions	Approved District & CPM Method	1 hour	Outlet of SCR serving this equipment
ROG Emissions	Approved District Method	1 hour	Outlet of SCR serving this equipment
PM Emissions	Approved District & CPM Method	1 hour	Outlet of SCR serving this equipment

Verification: The project owner shall submit the proposed protocol for the source tests 60 days prior to the proposed source test date to both the District and CPM for approval. The project owner shall notify the District and CPM no later than 7 days prior to the proposed source test date and time. The project owner shall submit source test results no later than 45 days following the source test date to both the District and CPM.

AQ-8 The operator shall provide to the District and CPM any source test report in accordance with the following specifications:

Source test results shall be submitted to the District and CPM no later than 60 days after the source test was conducted.

Emission data shall be expressed in terms of concentration (ppmv), corrected to 15 percent oxygen (dry basis), mass rate (lbs/hr), and lbs/MM cubic feet. In addition, solid PM emissions, if required to be tested, shall also be reported in terms of grains per DSCF.

All exhaust flow rate shall be expressed in terms of dry standard cubic feet per minute (DSCFM) and dry actual cubic feet per minute (DACFM).

All moisture concentration shall be expressed in terms of percent corrected to 15 percent oxygen.

Source test results shall also include the oxygen levels in the exhaust, the fuel flow rate (CFH), the flue gas temperature, and the generator power output (MW) under which the test was conducted.

Verification: See verifications for **AQ-5, -6, and -7.**

AQ-9 The project owner shall submit to the Commission, Quarterly Operational Reports that include the fuel use associated with each gas turbine train (both gas turbine and duct burner), in addition to the CO and NOx CEMS recorded data for each gas turbine exhaust stack on an hourly basis in order to verify the following emissions limits.

Except during startup, shutdown and initial commissioning, emissions from each gas turbine exhaust stack shall not exceed the following limits:

NOx (measured as NO₂): 2.5 ppm at 15% oxygen on a dry basis averaged over one hour and 18.27 lbs/hour.
 CO: 6 ppm at 15% oxygen on a dry basis averaged over 1 hour and 11.12 lbs/hr.
 SOx (measured as SO₂): 1.76 lbs/hr
 VOC: 6.37 lbs/hr
 PM10: 15.0 lbs/hr
 Ammonia: 5 ppm at 15% oxygen on a dry basis.

Verification: The project owner shall submit the Quarterly Operational Reports as specified herein to the CPM no later than 30 days following the end of each calendar quarter.

AQ-10 The operator shall vent the combined cycle turbine units 5 and 7, as well as their associated duct burners to the CO oxidation and SCR control whenever this equipment is in operation.

Verification: The project owner shall make the site available for inspection by representatives of the District, California Air Resources Board (CARB), the United States Environmental Protection Agency (EPA) and the California Energy Commission (Commission).

AQ-11 The operator shall limit emissions from this equipment as follows:

Contaminant	Emissions Limit
CO	20,566 LBS IN ANY 1 MONTH
PM10	20,336 LBS IN ANY 1 MONTH
VOC	7,588 LBS IN ANY 1 MONTH
Sox	2,342 LBS IN ANY 1 MONTH

The operator shall calculate the emission limit(s) by using monthly fuel use data and the following emission factors: PM10 6.26 lbs/MMscf, VOC 2.39 lbs/MMscf, and SOx 0.72 lbs/mmscf. Written records of startups shall be maintained and made available to the District.

The operator shall calculate the emission limit(s) for CO, during the commissioning period using fuel use data and the following emissions factors: 501 lbs/MMscf during the full speed no load tests and the part load tests when the turbine is operating at or below 60 percent load, and 14 lbs/MMscf during the full load tests when the turbine is operating above 60 per cent load.

The operator shall calculate the emission limit(s) for CO, after the commissioning period and prior to the CO CEMS certification, using fuel use data and the following emission factors: 100 lbs per startup and 4.55 lbs/MMscf for all other operations.

The operator shall calculate the emission limit(s) for CO, after the CO CEMS certification, based on readings from the certified CEMS. In the event the CO CEMS is not operating or the emissions exceed the valid upper range of the analyzer, the emissions shall be calculated in accordance with the approved CEMS plan.

For the purposes of this condition, the limit(s) shall be based on the total combined emissions from combined cycle gas turbine No. 5 and No. 7.

Verification: The project owner shall submit the monthly fuel use data and emission calculations to the CPM in the Quarterly Operation Reports (**AQ-9**).

AQ-12The operator shall keep records, in a manner approved by the District, for natural gas fuel use during the commissioning period.

Verification: The project owner shall make the site available for inspection by representatives of the District, California Air Resources Board (CARB), the United States Environmental Protection Agency (EPA) and the California Energy Commission (Commission).

AQ-13.The operator may, at his discretion, chose not to use ammonia injection if the following requirement is met:

The inlet exhaust temperature to the SCR is 450 degrees F or less, not to exceed 3 hours during a cold startup, 2 hours during a warm startup, and 1 hour during a hot startup.

Verification: The project owner shall make the site available for inspection by representatives of the District, California Air Resources Board (CARB), the United States Environmental Protection Agency (EPA) and the California Energy Commission (Commission).

AQ-14The operator shall install and maintain a CEMS to measure CO concentration in ppmv. Concentrations shall be corrected to 15 percent oxygen on a dry basis. The CEMS will convert the actual CO concentrations to mass emission rates (lbs/hr) and record the hourly emission rates on a continuous basis. The CEMS shall be installed and operated, in accordance with an approved District Rule 218 CEMS plan application. The operator shall not install the CEMS prior to receiving initial approval from District. The CO CEMS shall be installed and operated within 90 days after the initial start-up (first firing) of the gas turbines. The CEMS shall be installed and operated to measure CO concentration over a 15 minute averaging time period.

Verification: The project owner shall make the site available for inspection by representatives of the District, California Air Resources Board (CARB), the United States Environmental Protection Agency (EPA) and the California Energy Commission (Commission).

AQ-15The operator shall install and maintain a CEMS to measure NOx concentration in ppmv. Concentrations shall be corrected to 15 percent oxygen on a dry basis. The CEMS shall be installed and operating no later than 12 months after initial start-up of the turbine and shall comply with the requirements of Rule 2012. During the interim period between the initial start-up and the provisional

certification date of the CEMS, the operator shall comply with the monitoring requirements of Rule 2012(h)(2) and 2012(h)(3). Within two weeks of the turbine startup date, the operator shall provide written notification to the District of the exact date of start-up.

Verification: The project owner shall make the site available for inspection by representatives of the District, California Air Resources Board (CARB), the United States Environmental Protection Agency (EPA) and the California Energy Commission (Commission).

AQ-16The 2.5 PPM NO_x emission limit(s) shall not apply during turbine commissioning and startup periods. Startup time shall not exceed 3 hours per day. The commissioning period shall not exceed 33 operating days from the date of initial start-up. The operator shall provide the AQMD with written notification of the start-up date. No more than one turbine shall be in start-up mode at any one time. Written records of commissioning and start-ups shall be maintained and made available upon request from AQMD.

Verification: The project owner shall make the site available for inspection by representatives of the District, California Air Resources Board (CARB), the United States Environmental Protection Agency (EPA) and the California Energy Commission (Commission).

AQ-17The 6 PPM CO emission limit(s) shall not apply during turbine commissioning and startup periods. Startup time shall not exceed 3 hours per day. The commissioning period shall not exceed 33 operating days from the date of initial start-up. The operator shall provide the AQMD with written notification of the initial start-up date. No more than one turbine shall be in start-up mode at any one time. Written records of commissioning and start-ups shall be maintained and made available upon request from AQMD.

Verification: The project owner shall make the site available for inspection by representatives of the District, California Air Resources Board (CARB), the United States Environmental Protection Agency (EPA) and the California Energy Commission (Commission).

AQ-18The 109 LBS/MMCF NO_x emission limit(s) shall only apply during the turbine commissioning period during the full speed no load tests and the part load tests when the turbine is operating at or below 60% load to report RECLAIM emissions.

Verification: The project owner shall make the site available for inspection by representatives of the District, California Air Resources Board (CARB), the United States Environmental Protection Agency (EPA) and the California Energy Commission (Commission).

AQ-19The 33.9 LBS/MMCF NO_x emission limit(s) shall only apply during the turbine commissioning period during the full load tests when the turbine is operating above 60% load to report RECLAIM emissions. This emission limit shall also apply during the interim reporting period to report RECLAIM emissions. The interim reporting period shall not exceed 12 months from the initial startup date.

Verification: The project owner shall make the site available for inspection by representatives of the District, California Air Resources Board (CARB), the United States Environmental Protection Agency (EPA) and the California Energy Commission (Commission).

AQ-20The 80 lbs/hour NOx emission limit(s) shall only apply during turbine startups. Only one turbine shall be in startup mode at any one time. Startups shall not exceed 3 hours per day **per turbine**.

Verification: The project owner shall submit CEMS records demonstrating compliance with this condition as part of the Quarterly Operational Report required in **AQ-9**.

AQ-21The 102 LBS/MMCF NOx emission limit(s) shall only apply to report RECLAIM emissions during the interim period for the duct burner. The interim reporting period shall not exceed 12 months from the initial start-up date.

Verification: The project owner shall make the site available for inspection by representatives of the District, California Air Resources Board (CARB), the United States Environmental Protection Agency (EPA) and the California Energy Commission (Commission).

AQ-22For the purpose of the following condition numbers, the phrase “continuously record” shall be defined as recording at least once every hour and shall be calculated based upon the average of the continuous monitoring for that hour.

Condition no. **AQ-2**

Condition no. **AQ-3**

Condition no. **AQ-24**

Verification: See verifications for **AQ-2, -3, and -24**.

AQ-23For the purpose of the following condition number, the phrase “continuously record” shall be defined as recording at least once every hour and shall be calculated based upon the average of the continuous monitoring for that month.

Condition no. **AQ-4**

Verification: See verifications for **AQ-4**.

AQ-24The 2.5 PPMV NOx emission limit(s) are averaged over 60 minutes at 15 percent oxygen, dry.

Verification: The project owner shall submit CEMS records demonstrating compliance with this condition as part of the Quarterly Operational Report required in **AQ-9**.

AQ-25The 6 PPMV CO emission limit(s) are averaged over 60 minutes at 15 percent oxygen, dry.

Verification: The project owner shall submit CEMS records demonstrating compliance with this condition as part of the Quarterly Operational Report required in **AQ-9**.

AQ-26 The 5 PPMV NH₃ emissions limit(s) are averaged over 60 minutes at 3 percent O₂, dry. The operator shall calculate and continuously record the NH₃ slip concentration using the following:

$$\text{NH}_3 \text{ (ppmv)} = [a - (b \cdot c / 1000000)] \cdot 1000000 / b, \text{ where}$$

a = ammonia injection rate (lb/hr)/17 (lbs/lb-mole)
b = dry exhaust gas flow rate (lb/hr)/29 (lbs/lb-mole)
c = change in measured NO_x across the SCR (ppmv, dry basis)

The operator shall install and maintain a NO_x analyzer, or other method as approved by the District, to measure the SCR inlet NO_x ppm accurate to within +/- 5 percent calibrated at least every 12 months.

Verification: The project owner shall submit CEMS records and all calculations demonstrating compliance with this condition as part of the Quarterly Operational Report required in **AQ-9**.

AQ-27 This equipment shall not be operated unless the operator demonstrates to the Executive Officer that the facility holds sufficient RTCs to offset the prorated annual emissions increase for the first compliance year of operation. In addition, this equipment shall not be operated unless the operator demonstrates to the Executive Officer that, at the commencement of each compliance year after the first compliance year of operation, the facility holds sufficient RTCs in an amount equal to the annual emissions increase.

Verification: The project owner shall submit to the CPM copies of all RECLAIM reports filed with the District in each Quarterly Operational Report (see **AQ-9**).

Condition of Certification AQ-28, below, pertains to the following equipment:

Internal combustion engine, emergency fire pump, diesel Clarke, Model JDFP 06WA, turbocharged, aftercooled, 265 BHP A/N 378769 (ID. No. D45).

AQ-28 The operator shall limit the operating time to no more than 199 hours in any one year.

- To comply with this condition, the operator shall install and maintain a non-resettable elapsed time meter to accurately indicate the elapsed operating time of the engine.
- The operator shall maintain records in a manner approved by the District to demonstrate compliance with this condition.
- The records shall include, date of operation, the elapsed time in hours, and the reason for operation. Records shall be kept and maintained on file for a minimum of 5 years and made available to AQMD upon request.

Verification: The project owner shall submit the recorded data specified in this condition on an annual basis as part of the fourth Quarter Operational Report (see **AQ-8**).

Conditions of Certification AQ-29 and AQ-30, below, pertain to the following equipment:

Underground Aqueous Ammonia Storage Tank, TK-001, carbon steel, double walled with three transfer pumps and a PVR set at 50 PSIG, 20000 gallons capacity. A/N 379904 (ID. No. D30)

AQ-29The operator shall install and maintain a pressure relief valve set at 50 psig.

Verification: The project owner shall make the site available for inspection by representatives of the District, CARB, EPA and the Commission.

AQ-30The operator shall upon completion of construction, operate and maintain this equipment according to the following specifications:

In compliance with all mitigation measures as stipulated by the “Statement of Findings, Statement of Overriding Considerations, and Mitigation Monitoring Plan” and final subsequent Environmental Impact Report dated January, 1994 (SCH No. 88032315) for the El Segundo Generating Station ammonia storage and selective catalytic reduction project.

Verification: The project owner shall submit the “Statement of Findings, Statement of Overriding Considerations and Mitigation Monitoring Plan” and the final subsequent Environmental Impact Report dated, 1994 (SCH No. 88032315) to the CPM in a timely manner.

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BIOLOGICAL RESOURCES

Testimony of Dr. Noel Davis, Dr. Mike Foster, Shari Koslowsky,
Dr. Pete Raimondi, Dr. Gregor Caillet, and Rick York

INTRODUCTION

This section provides the Energy Commission staff's analysis of the proposed El Segundo Generating Station (ESGS) Power Redevelopment Project's (1) compliance with applicable laws, ordinances, regulations and standards (LORS) concerning biological resources; and (2) potential environmental impacts to biological resources. This analysis is based, in part, on information provided in the Application for Certification (AFC) (ESPR 2000a), the supplemental biological materials submitted by the Applicant in January 2001 (ESPR 2000h) and December 2001 (ESPR 2001a), the Applicant's various data responses, and the staff's site visit completed on March 14, 2001.

This staff analysis presents information regarding the affected biotic community and the potential environmental impacts associated with the construction and operation of the proposed project. Impacts to biological resources may be caused either by the structures and/or operations undertaken as part of this proposed power plant modification. Related biological impacts may be caused by other existing or foreseeable future projects in the area, and are addressed in the Cumulative Impacts section of this staff analysis.

The project will cause unmitigated adverse biological impacts. Staff's analysis finds that the entrainment, impingement and thermal effects on fish and invertebrates from the project's once-through cooling system will cause unmitigated direct adverse impacts to marine organisms that may be significant and cumulative impacts that are significant. Because the Applicant has provided unreliable recent scientific information concerning the extent of adverse entrainment impacts on fish larvae and other plankton species, staff cannot determine the scope and magnitude of the project's *direct* impacts at this time. However, the waters of Santa Monica Bay and the Southern California Bight are already experiencing serious degradation in a number of marine organisms, and the unmitigated entrainment, impingement and thermal impacts of the proposed project will cause significant *cumulative* adverse biological impacts to marine organisms. Other potential adverse impacts of the project to marine and terrestrial organisms have been analyzed and determined to be insignificant.

The project does not comply with all applicable LORS. The Applicant has supplied unsound scientific information that fails to establish the extent of adverse biological entrainment impacts on fish larvae and other plankton species, and the adverse impacts may be significant. As a result, the proposed project does not currently comply with all applicable LORS, including the California Coastal Act and the federal Magnuson-Stevens Fishery Conservation and Management Act, as discussed further in the text below.

Elimination of the use of sea water for once-through cooling would also eliminate the adverse entrainment and impingement impacts. Staff has investigated alternative

cooling options and has determined that the use of reclaimed water from the Hyperion Treatment Plant is economically and technically feasible.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

FEDERAL

Endangered Species Act of 1973

Title 16, United States Code, section 1531 et seq., and Title 50, Code of Federal Regulations, part 17.1 et seq., designate and provide for protection of threatened and endangered plant and animal species and their critical habitat. The administering agency is the U. S. Fish and Wildlife Service (USFWS).

Migratory Bird Treaty Act

Title 16, United States Code, sections 703 through 711, prohibits the take of migratory birds, including nests with viable eggs. The administering agency is the USFWS.

Clean Water Act

Section 303(d)

Section 303(d) of the Clean Water Act requires that states develop a list of waterbodies that need additional work beyond existing controls to achieve or maintain water quality standards. The additional work includes the establishment of total maximum daily loads of pollutants that have impaired the waterbody.

Section 316(b)

Section 316(b) of the Clean Water Act requires that the location, design construction and capacity of cooling water intake structures reflect the best technology available for minimizing adverse environmental impact.

On December 18, 2001, the United States Environmental Protection Agency (USEPA) published in the Federal Register (40 FR Parts 9, 122, *et seq.*) a final rule that implements Section 316(b) for *new* facilities that use water withdrawn from rivers, streams, lakes, reservoirs, estuaries, oceans or other waters of the United States for cooling purposes. The national requirements establish the best technology available for minimizing adverse environmental impacts associated with these structures.

Recently proposed rules for *existing* intakes were published by USEPA in the Federal Register in April 2002 (40 CFR Parts 9, 122, 123, 124 and 125). The proposed rules state that any facility that has a cooling water intake that withdraws more than 50 million gallons per day from a waterbody for cooling and also has a point source discharge would have three options to demonstrate that it has the best technology available for minimizing adverse environmental impacts. The first option would be to demonstrate that the intake currently meets specified performance standards.¹ The second option

¹ Under the proposed EPA rule, the performance standards for existing cooling water intakes located in an estuary or ocean require that the facility either employ technologies that reduces intake capacity to a level equivalent to that of a closed-cycle, recirculating cooling system or that the facility employ control

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would be to demonstrate that the facility can meet performance standards by any combination of (a) implementing intake designs shown to reduce impacts, (b) implementing operational measures to reduce intake flows or (c) implementing restoration measures to replace individuals or habitat of species lost to the intake. The third option would be to demonstrate for the particular facility that the costs to meet the specified performance criteria would be greater than the costs estimated by EPA in formulating its proposed rule or that the costs would be much greater than the benefits derived by complying with the performance standards.

Section 402

Section 402 of the Clean Water Act states that discharge of pollutants to waters of the United States is unlawful unless the discharge is in compliance with a National Pollution Discharge Elimination System (NPDES) permit. The administering agency for the NPDES permit is the Los Angeles Regional Water Quality Control Board (LARWQCB). The ESGS NPDES permit was renewed in 2000 and expires on June 29, 2005. (LARWQCB 2002b).

Fish and Wildlife Coordination Act

Title 16 United States Code, section 661 et seq., requires federal agencies such as the U. S. Army Corps of Engineers to coordinate federal actions with the USFWS to conserve fish and wildlife resources. The administering agency is the USFWS.

Marine Mammal Protection Act

Title 16 United States Code, Chapter 31 1361-1375 provides protection for marine mammals.

Magnuson-Stevens Fishery Management and Conservation Act

The Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. 1801 et seq.) was passed to take immediate action to conserve and manage the fishery resources found off the coast of the United States. Section 395 (b)(4)(A) of this act specifies that if NMFS determines that any action undertaken by any state or federal agency would affect any essential fish habitat, it shall recommend measures that can be taken by such agency to conserve such habitat.

STATE

California Endangered Species Act of 1984

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

Nest or Eggs

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

technologies to reduce impingement mortality by 80 to 95 percent and entrainment by 60 to 90 percent for fish and shellfish.

Birds Of Prey Or Eggs

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

Migratory Birds

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

Fully Protected Species

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

Significant Natural Areas

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

Native Plant Protection Act of 1977

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

California Code of Regulations

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

California Coastal Act of 1976

Policy 30230

This policy states that marine resources shall be maintained, enhanced, and where feasible, restored and that special protection shall be given to areas and species of special biological or economic significance. This policy specifies also that uses of the marine environment be carried out in a manner that will sustain the biological productivity of coastal waters and that will maintain healthy populations of all species of marine organisms.

Policy 30231

This policy states that biological productivity and the quality of coastal waters, streams, wetlands, estuaries and lakes appropriate to maintain optimum populations of marine organisms and for the protection of human health shall be maintained and, where feasible, restored through, among other means, minimizing adverse effects of wastewater discharges and entrainment, controlling runoff, preventing depletion of groundwater supplies and substantial interference with surface water flow, encouraging wastewater reclamation, maintaining natural vegetation buffer areas that protect riparian habitats, and minimizing alteration of natural streams.

Policy 30413(d)

This policy requires the California Coastal Commission to provide a written report to the California Energy Commission (Energy Commission) that includes provisions necessary to ensure conformity of the proposed project with the policies of both the statewide Coastal Act and of certified local coastal programs in those jurisdictions that would be affected by the development. Furthermore, the Warren-Alquist Act (Public Resources Code section 25523(b)) requires the Energy Commission to include in its decision on an AFC for proposed power plants within the coastal zone specific provisions to meet the objectives of the Coastal Act as may be specified in the report submitted by the Coastal Commission pursuant to Section 30413(d) of the Coastal Act, unless these provisions would result in a “greater adverse effect on the environment” or “would not be feasible.”

LOCAL

The El Segundo General Plan includes the following policies in the Conservation Element: beach preservation, maintenance of a safe water supply, protection of groundwater from contamination, improvement of the urban landscape, and protection of the El Segundo blue butterfly, a federally-listed Endangered species. The City’s policy on the El Segundo blue butterfly is to “develop and encourage environmental protection policies that protect sensitive habitat areas, including coordination with city, county, state and federal agencies having jurisdiction over such areas.” The administering agency is the City of El Segundo Planning and Development Department.

SETTING

The proposed El Segundo Power Redevelopment (ESPR) Project would be located on the property of the existing El Segundo Generating Station at 301 Vista Del Mar. This site is approximately 2.5 miles southwest of the Los Angeles International Airport (LAX) and west of the San Diego Freeway (I-405), on the eastern shore of Santa Monica Bay. The site is bordered by Vista Del Mar and the Chevron refinery to the east, 45th Street in the City of Manhattan Beach on the south, Santa Monica Bay on the west and the Chevron Marine Terminal on the north. The 33-acre site is currently composed of three parcels.

- The existing ESP II generating units are located on APN 4138-029-002, an approximately 24.7 acre parcel.
- The existing Southern California Edison (SCE) substation is located on APN 4138-029-800, an approximately 2.25 acre parcel.
- The existing SCE tank farm is located on APN 4138-029-801, an approximately 9.0 acre parcel. This site will be used for laydown, staging and parking during construction.

The existing topography at the south end of the site slopes downward, at a 1-1.5 gradient, from 90 feet above mean sea level (amsl) at the gatehouse to 39 feet amsl at the fuel tank area to 25 feet amsl at the retention basin. The proposed power block complex will be at 20 feet amsl, with drop inlet locations at 18 feet amsl.

TERRESTRIAL BIOLOGICAL RESOURCES

The proposed project site and ancillary facilities are located in a highly industrialized area, with the exception of the adjacent marine environment of Santa Monica Bay. Historically, terrestrial habitat at and adjacent to the site may have included sandy beach, southern dune scrub, coastal salt marsh and coastal sand dune habitat adjacent to the Bay. Today, only small, isolated patches of natural vegetation and associated wildlife remain as a result of heavy industrial development of the area, including a few small areas of ornamental plantings (i.e. palm trees) immediately to the east of the existing ESGS boundary and isolated patches of ruderal vegetation such as grasses, thistles and other weedy species. Consequently, few wildlife species are supported on the site or adjacent, vegetated habitats. Common urban birds are most common and include pigeons, mourning doves, starlings and house sparrows.

Sensitive Terrestrial Species

Table 1 below provides a list of sensitive species that may be found in the terrestrial environment of the Project area (ESPR, 2000a, AFC, Table 5.6-1); however, it is unlikely that any of these species would persist within the project site or adjacent areas given the highly disturbed and fragmented nature of the habitat. The species in the table that were identified in USFWS correspondence (USFWS 2001) are associated with vernal pool or dune habitats and have no recent historical record of occurrence within the power plant site and construction laydown area nor were they identified during site surveys. Any areas that could potentially support such species were avoided by the applicant in the placement of construction or operational features of the project. Exception to this are two sensitive habitat areas located at the Chevron Preserve approximately 0.3 miles NE of the Power Plant site, and the El Segundo Dunes Preserve located approximately 1.5 miles NNW of the site that provide habitat to the El Segundo blue butterfly (*Euphilotes battoides allyni*), a federally-listed endangered species. More distant from the plant are the Ballona Wetlands located approximately 4.5 miles NNW and Malaga Cove, the latter of which is also occupied habitat for the El Segundo blue butterfly, located approximately 7 miles S of ESGS. These two sites are not affected by the potential impacts to terrestrial biological resources that are discussed in the following sections.

**Biological Resources Table 1:
Sensitive Terrestrial Species Potentially Occurring in the Project Vicinity**

Scientific Name	Common Name	Status*
CLASS DICOTYLEDONAE	PLANTS	
<i>Potentilla multijuga</i>	Ballona cinquefoil	FSC/List 1A
<i>Dithyrea maritime</i>	beach spectaclepod	FSC/ST/List 1B
<i>Orcuttia californica</i> *	California Orcutt grass*	FE/SE/List 1B
<i>Astragalus tener</i> var. <i>titi</i> *	Coastal dunes milk vetch*	FE/SE/List 1B
<i>Lasthenia glabrata</i> ssp. <i>Coulteri</i>	Coulter's goldfields	FSC/List 1B
<i>Eryngium aristulatum</i> var. <i>parishii</i> *	San Diego button celery*	FE/SE/List 1B
<i>Centromedia parryi</i> ssp. <i>Australis</i>	southern tarplant	FSC/List 1B
<i>Astragalus pycnostachyus</i> var. <i>lanosissimus</i>	Ventura marsh milk vetch	SE/List 1B
CLASS AVES	BIRDS	
<i>Passerculus sandwichensis beldingi</i>	Belding's savannah sparrow	SE
<i>Athene cunicularia</i>	burrowing owl	SSC
<i>Polioptila californica</i>	California coastal gnatcatcher	FE/SSC
CLASS AMPHIBIA	AMPHIBIANS	
(i) <i>caphiopus hammondii</i> *	western spadefoot toad*	SSC
CLASS INSECTA	INSECTS	
<i>Euphiloites battoides allyni</i>	EI Segundo blue butterfly	FE
CLASS CRUSTACEA	CRUSTACEANS	
<i>Streptocephalus woottoni</i> *	Riverside fairy shrimp*	FE
<p>* Status Legend: FE = Federal Endangered, FT = Federal Threatened, SE = State Endangered, ST = State Threatened, FSC = Federal Species of Concern, SSC = State Species of Special Concern, List 1A (California Native Plant Society Inventory or Rare and Endangered Plants of California 2001) = Plants Presumed Extinct, List 1B = Plants Rare and Endangered In California and Elsewhere</p>		

Source, ESPR 2000a, AFC Section 5.6

Species names denoted with "*" were identified in USFWS correspondence (USFWS 2001).

The EI Segundo blue butterfly is unique to a few locations in Los Angeles County. It occurs only in relatively undisturbed coastal sand dunes, including, historically, the EI Segundo sand dunes. These dunes were undisturbed until the 1880s, when development of the City of Redondo Beach separated the main dunes from their southern extension. The growth of Venice eliminated the dunes north of the mouth of Ballona Creek and conversion of the central dunes began in 1911, when Chevron

constructed their refinery. This separated the remaining dunes into two fragments. Both fragments were progressively damaged as a result of housing development and, by 1960, only 80 acres of dune habitat remained. In 1992, the City of Los Angeles created the 200-acre El Segundo Dunes Preserve at the western end of Los Angeles International Airport (Mattoni 1998, USFWS 1976).

Today, the El Segundo blue butterfly occurs only in dune habitat at the El Segundo Dunes Preserve (LAX site), the Chevron Refinery (Chevron Preserve or CHEV site) and Malaga Cove (MC site). In 1991, the El Segundo Dunes Preserve supported the largest population of the El Segundo blue butterfly both in terms of area and density, with approximately 5,000 butterflies on 3,358 plants on 24 acres. In 1986, the Chevron Preserve supported about 400 butterflies on 1,240 plants on 1.6 acres. And in 1990, the Malaga Cove dunes supported a population of approximately 60 butterflies on 50 plants (Mattoni 1998).

MARINE BIOLOGICAL RESOURCES

Marine Communities

The ESGS is located adjacent to Santa Monica Bay, an open embayment on the central part of the southern California coast. Santa Monica Bay is bordered offshore by Santa Monica Basin and on each end by rocky headlands (Point Dume at the northwest end and Palos Verdes Point at the southeast end).

The natural marine habitats in the vicinity of ESGS consist primarily of sand substrate. However, the sandy beach and nearshore sand bottom are broken by various manmade structures that provide some hard bottom habitat. These structures include the intake and discharge facilities of Units 1 and 2 and Units 3 and 4 of the ESGS, the Chevron Refinery outfall, the Scattergood Generating Station intake and outfall, and the Hyperion Sewage Treatment Plant outfalls. A rock groin to protect the pipelines and retard beach erosion has been constructed by Chevron on the beach in front of ESGS. In 2000, an artificial surfing reef (Pratte's Reef) was built in 15 feet of water about 1,500 yards north of ESGS.

Characteristic sandy beach organisms at the southern end of Santa Monica Bay include bean clams (*Donax gouldii*), isopods (*Excirolana chiltoni*), sand crabs (*Emerita analoga*), beach hoppers (*Orchestoidea* spp.), and a number of species of polychaete worms (Straughan 1980). Intertidal surveys at ESGS in the early 1970s showed that *E. analoga* and *E. chiltoni* were by far the most abundant species on the beach near the power plant (Benson et al., 1973). The worm *Nephtys californiensis* was third in abundance.

The intake and discharge for Units 1 and 2 are located approximately 2,590 and 1,989 feet respectively offshore at a depth of 32 feet Mean Lower Low Water (MLLW). The intake and discharge structures for Units 1 and 2 are located about 240 feet north of the intake and discharge facilities for Units 3 and 4.

MBC Applied Environmental Sciences has monitored the marine environment in the vicinity of ESGS for over 20 years (MBC 1999). Annelid worms, crustaceans and mollusks dominate the invertebrate community living in the sand (infauna). The

community is diverse and species composition is somewhat variable from year to year, with no particular species dominant in all years. In the three years prior to submission of the ESPR AFC, the polychaete worm, *Apoprionospio pygmaea*, was the most abundant species collected (MBC 1997, 1998, 1999).

Common epifaunal (living on top of the sand) invertebrates in the vicinity of ESGS include sand dollars (*Dendraster excentricus*), tube worms (*Diopatra* spp. and *Owenia* spp.) and a variety of crabs (*Portunus xantusii*, *Pyromaia tuberculata*, *Cancer antennarius*, *C. anthonyi*, and *C. gracilis*) (MBC 1997, 1998, 1999).

Fish populations in the vicinity of ESGS are typical of southern California nearshore soft bottom habitats. The most abundant fish caught in trawls in the vicinity of ESGS include white croaker (*Genyonemus lineatus*), queenfish (*Seriphus politus*), northern anchovy (*Engraulis mordax*) and Pacific sanddab (*Citharichthys stigmaeus*) (Love et al. 1986).

Regular monitoring is conducted of fish trapped (impinged) on the ESGS intake screens. Fish impingement sampling is conducted at the ESGS intakes during representative periods of normal operation and during all heat treatment procedures to obtain an estimate of total impingement for the year. Table 2 shows the ten most abundant fish species impinged at ESGS and nearby Scattergood Generating Station between 1990 and 1999. In 1997 and 1998, the three most abundant fish species impinged at ESGS were jacksmelt (*Atherinopsis californiensis*), queenfish, and salema (*Xenistius californiensis*) (MBC 1997, 1998). In 1999 the three most abundant fish species impinged at ESGS were sargo (*Anisotremus davidsoni*), Pacific sardine (*Sardinops sagax*), and salema.

**Biological Resources Table 2:
Ten Most Abundant Fish Species Impinged at the ESGS and Scattergood
Generating Station Intakes between 1990 and 1999**

Common Name	Scientific Name
Queenfish	<i>Seriphus politus</i>
Topsmelt	<i>Atherinops affinis</i>
Salema	<i>Xenistius californiensis</i>
Jacksmelt	<i>Atherinopsis californiensis</i>
White Croaker	<i>Genyonemus lineatus</i>
Kelp Bass	<i>Paralabrax clathratus</i>
Barred Sand Bass	<i>Paralabrax nebulifer</i>
Sargo	<i>Anisotremus davidsonii</i>
Blacksmith	<i>Chromis punctipinnis</i>
Yellowfin Croaker	<i>Umbrina roncadore</i>

Source: MBC 1999

Limited data are available on the ichthyoplankton (fish eggs and larvae) in the vicinity of ESGS. Ichthyoplankton were collected in the vicinity of the ESGS intake in September, October, and November of 2000 (Pondella 2001). The most abundant fish larvae collected were unidentified gobies, white croaker, and northern anchovy. Other fish larvae collected in the vicinity of ESGS included queenfish, spotted kelpfish (*Gibbonsia elegans*), black croaker (*Cheilotrema saturnum*), California clingfish (*Gobiesox rhessodon*), giant kelpfish (*Heterostichus rostratus*), and slender sole (*Lyopsetta exilis*).

Bird species observed during recent surveys in the ocean waters offshore ESGS include the California brown pelican (*Pelecanus occidentalis californicus*), surf scoter (*Melinita perspicillata*), western gull (*Larus occidentalis*), Heermann's gull (*L. heermanni*), western grebe (*Aecmophorus occidentalis*), Brandt's cormorant (*Phalacrocorax penicillatus*), Caspian tern (*Sterna caspia*), and royal tern (*S. maxima*) (MBC 1997, 1998, 1999). The sandy beach in the vicinity of ESGS is used for foraging by a variety of shorebirds including sanderling (*Calidrus alba*), willet (*Catrophorus semipalmatus*), whimbrel (*Numenius phaeopus*), marbled godwit (*Limosa fedoa*), and black-bellied plover (*Pluvialis dominica*).

Four species of baleen whales and eight species of toothed whales have been recorded in Santa Monica Bay waters (MBC 1988). The species most frequently sighted in recent marine mammal surveys in Santa Monica Bay were bottlenose dolphin (*Tursiops truncatus*), short-beak common dolphin (*Delphinus delphis*), and long-beak common dolphin (*D. bairdii*) (Bearzi 1999). Pacific white-sided dolphins (*Lagenorhynchus obliquidens*) and Risso's dolphins (*Grampus griseus*) were observed in Santa Monica Bay less frequently. Minke whales (*Balaenoptera acutorostrata*) and gray whales (*Eschrichtius robustus*) were recorded during their winter and spring migrations. The California sea lion (*Zalophus californianus*) is the most abundant pinniped species in Santa Monica Bay followed by the Pacific harbor seal (*Phoca vitulina*) (Bearzi 1999). California sea lions and bottlenose dolphins have been observed in the vicinity of ESGS during recent monitoring surveys (MBC 1997, 1998, 1999).

Sensitive Marine Species

Table 3 lists sensitive marine species that have the potential to occur in the vicinity of ESGS.

**Biological Resources Table 3:
Sensitive Marine Species Potentially Occurring in the Project Vicinity**

Scientific Name	Common Name	Status*
CLASS OSTEICHTHYES	BONY FISH	
<i>ONCORHYNCHUS MYKISS</i>	SOUTHERN STEELHEAD	FE, SSC
CLASS REPTILIA	REPTILES	
<i>Caretta</i>	loggerhead sea turtle	FT
<i>Dermochelys coriacea</i>	leatherback sea turtle	FT
<i>Chelonia midas</i>	green sea turtle	FE
CLASS AVES	BIRDS	
<i>Gavia immer</i>	common loon	SSC
<i>Pelecanus occidentalis californicus</i>	California brown pelican	FE, SE
<i>Phalacrocorax auritus</i>	double-crested cormorant	SSC
<i>Charadrius alexandrinus nivosus</i>	western snowy plover	FT, SSC
<i>Numenius americanus</i>	long-billed curlew	SSC
<i>Larus californicus</i>	California gull	SSC
<i>Sterna elegans</i>	elegant tern	FSC, SSC
<i>Sterna antillarum browni</i>	California least tern	SE, FE
<i>Rynchops niger</i>	black skimmer	SSC
CLASS MAMMALIA	MAMMALS	
<i>Enhydra lutris nereis</i>	southern sea otter	FT
<i>Arctocephalus townsendii</i>	Guadalupe fur seal	FT, ST
<i>Balaenoptera musculus</i>	blue whale	FE
<i>Balaenoptera physalus</i>	fin whale	FE
<i>Balaenoptera borealis</i>	Sei whale	FE
<i>Megaptera novaenglinae</i>	humpback whale	FE
<i>Eubalaena glacialis japonica</i>	Pacific right whale	FE
<i>Physeter catodon</i>	sperm whale	FE
* Status Legend: FE = Federal Endangered; FT = Federal Threatened; SE = State Endangered; ST = State Threatened; FSC = Federal Species of Concern; SSC = State Species of Special Concern		

Source: ESPR 2000a, AFC Section 5.6

The state and federally listed Endangered California least tern (*Sterna antillarum browni*) nests on the sandy beach at Venice Beach approximately 4 miles north of ESGS. In 1998, 375 pairs of terns bred at this colony (Keane, personal communication, 2000). In 1999, the number of least tern pairs at Venice Beach declined to 43 but increased to 200 in 2000 (Keane 2001). Least terns nest between April and August, and winter in Central or South America. The preferred prey of California least terns is northern anchovy and topsmelt (*Atherinops affinis*). Least terns from the Venice Beach

colony use all the waters in the vicinity of the colony for foraging, but feed most frequently in shallow nearshore waters within 2 miles of the colony (Atwood and Minsky 1983).

The western snowy plover (*Charadrius alexandrinus nivosus*) is a federally listed Threatened species and a California Species of Special Concern. This small shorebird nests on coastal sandy beaches and the shores of salt ponds and alkaline lakes. They forage for insects and marine invertebrates in wet sand along the edge of the water. Snowy plovers do not nest in the vicinity of ESGS, but wintering snowy plovers would be expected to forage occasionally on the sandy beach near ESGS. Surveys of wintering snowy plovers between 1979 and 1985 recorded a yearly median of 13 birds in the El Segundo/Hermosa Beach area (Page et al. 1986).

The federally and state listed Endangered California brown pelican nests on Anacapa and Santa Barbara Islands, off the Pacific coast of Baja California, Mexico and in the Gulf of California, Mexico. California brown pelicans are common in the waters offshore ESGS especially during the non-breeding season of July through December. They feed primarily on northern anchovy.

Several marine bird species that are California Species of Special Concern would be expected to occur in the nearshore waters offshore ESGS. These species include the common loon (*Gavia immer*), double-crested cormorant (*Phalacrocorax auritus*), and elegant tern (*Sterna elegans*). Of these species only elegant terns breed locally. Elegant terns nest in the Port of Los Angeles, about 14 miles southeast of ESGS. Black skimmers (*Rynchops niger*) also nest in the Port of Los Angeles and forage occasionally in ocean waters.

California gulls (*Larus californicus*), a California Species of Special Concern, nest inland primarily at Mono Lake but are common on the beaches and nearshore ocean waters in the vicinity of ESGS during the non-breeding season. The long-billed curlew (*Numenius americanus*), a California Species of Special Concern, is a shorebird that winters in southern California and is most common in wetlands. They might occasionally forage on the sandy beach near ESGS.

The other sensitive species listed in Biological Resources Table 3 (above) would be expected to occur only very rarely in the nearshore waters in the vicinity of ESGS.

DIRECT IMPACTS

ONCE-THROUGH COOLING SYSTEM IMPACTS

A. Cooling System Operations

The Applicant proposes to provide once-through cooling water for the new generating units 5, 6, and 7 by using an existing cooling water intake and discharge system which is now providing cooling water for existing generating units 1 and 2. No physical

modification of the existing intake or outfall is proposed. Therefore, no *construction-related* impacts to marine resources will occur.

Cooling water for the proposed Units 5, 6, and 7 will be withdrawn from the ocean by an existing vertical “intake riser” located in Santa Monica Bay, approximately 2,500 feet from the proposed power plant. The intake riser has an inside diameter of 11 feet 4 inches x 14 feet, and is covered by a “velocity cap” positioned 3 feet above the riser mouth. The velocity cap imparts a horizontal current of 2.4 feet per second (fps) at the point of seawater withdrawal (ESPR 2000a).

The withdrawn ocean water is then conveyed at a velocity of 4.1 fps through a 2,500 foot long, 10-foot diameter pipe that leads into a large forebay adjacent to the generating plant. There the seawater is stored and periodically withdrawn from the forebay, as needed, through a screened intake device for direct use in the cooling system of the generating facilities. The average velocity of the forebay water as it approaches the power plant intake screens is 0.8 fps and the water passes through the screens at 1.8 fps.²

After being withdrawn from the forebay and passing through the intake screens, the cooling water is pumped to each of the power plant’s condensers. The water temperature is increased by approximately 54 degrees Fahrenheit (F) when the existing Units 1 and 2 are operated at full capacity. This heated water is then discharged through a separate outfall pipe with a 10 ft inside diameter. The outfall pipe terminates approximately 1,900 feet offshore at a water depth of –26 feet. The discharge is through the open upward facing end of the pipe. When the units are operating at full capacity the temperature at the discharge outfall point is about 20 degrees F above the ambient ocean temperature. Thermal discharge temperatures are limited to 105 degrees F or less by existing NPDES permit conditions (ESPR 2000a).

Periodically, the power plant cooling water is heated even further and then discharged back into the forebay and ocean water intake tunnel for “heat treatment” purposes. The purpose of this “heat treatment” discharge is to kill the organisms that may be fouling the ocean water intake pipe, the storage forebay, the intake screens and/or the cooling system itself.

² For comparison purposes, the federal EPA’s recently adopted final rule implementing Section 316(b) of the Clean Water Act addresses cooling water intake structures for new facilities and sets a maximum through-screen intake velocity requirement of 0.5 fps (USEPA 2001). This velocity requirement was set based on scientific studies that suggest a 0.5 fps intake velocity would protect 96 percent of the tested fish. The proposed ESGS project is not considered a “new” facility according to the adopted 316(b) rule; however, the actual intake velocities at ESGS (e.g. 4.1 fps through the intake pipe) clearly do not come close to meeting the current “new” facility standard and are certainly not the Best Technology Available for reducing adverse biological impacts.

The NPDES permit for the existing cooling water system currently limits total volumetric intake and discharge of Units 1 and 2 to 207 million gallons or less per day (mgd). However, the ESGS Power Redevelopment Project is expected to significantly increase average daily flow rates over actual conditions existing at the time this AFC was filed. Table 4, below, shows the average daily flows through the Units 1 and 2 intake for every month from May 1977 through December 2000. This table demonstrates that flows at the existing units decreased substantially after 1983.

Biological Resources Table 4
Average Daily Flow Volumes for Intake #1 at ESGS
(Millions of Gallons)

Month # of days	Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Nov	Dec	Yearly Daily Ave.
	31	28	31	30	31	30	31	31	30	31	30	31	
1977	*	*	*	*	164.8	207.0	205.6	201.4	206.5	206.4	192.9	207.0	199.0
1978	207.0	184.2	200.7	207.0	207.0	205.0	206.5	203.5	206.8	206.5	204.3	206.2	203.7
1979	207.0	198.3	206.9	206.6	155.2	103.5	160.6	207.0	207.0	204.8	160.7	101.3	176.6
1980	166.8	206.0	192.0	186.3	202.7	206.9	207.0	116.9	172.5	205.4	164.1	200.9	185.6
1981	204.6	207.0	206.3	171.4	206.0	205.6	198.5	199.3	191.5	200.2	205.9	206.3	200.2
1982	206.6	206.3	195.3	377.4	183.5	206.8	179.0	201.0	199.9	192.2	181.9	207.0	211.4
1983	195.3	166.2	166.3	206.9	206.3	182.5	194.7	203.0	194.3	192.4	154.5	193.5	188.0
1984	175.3	183.2	160.3	157.9	177.7	153.5	186.8	183.3	164.8	81.7	63.7	113.4	150.1
1985	202.5	205.6	176.1	193.4	153.3	166.2	204.9	136.7	84.9	71.0	181.0	191.9	164.0
1986	115.2	147.9	103.1	58.7	150.4	66.3	96.5	139.8	70.8	140.9	75.9	65.9	102.6
1987	143.6	85.1	83.2	115.6	105.2	65.6	51.8	101.9	77.7	90.2	96.6	88.5	92.1
1988	58.5	103.5	121.9	69.0	141.9	91.4	138.5	101.8	69.0	51.8	89.7	90.2	93.9
1989	90.2	123.9	108.5	58.7	53.5	89.7	86.8	51.8	58.7	51.8	67.3	60.1	75.1
1990	51.8	88.7	100.2	67.3	234.0	27.6	50.1	40.1	27.6	0.0	0.0	13.4	58.4
1991	110.2	110.9	106.8	103.5	116.9	110.4	110.2	93.5	10.4	66.8	44.9	0.0	82.0
1992	35.1	0.0	68.5	62.1	56.6	51.8	76.8	111.9	8.7	56.8	79.4	101.9	59.1
1993	51.8	51.8	55.1	51.8	56.6	58.7	56.8	N/A	51.8	N/A	51.8	51.8	44.8
1994	70.1	42.6	51.8	63.9	59.8	74.2	51.8	93.5	51.8	70.2	51.8	51.8	61.1
1995	51.8	46.8	51.8	50.1	56.6	50.1	70.2	143.5	108.7	51.8	50.1	51.8	65.3
1996	51.8	51.8	51.8	51.8	26.7	77.7	77.7	101.9	51.8	51.8	51.8	51.8	58.2
1997	51.8	51.8	51.8	62.2	83.8	89.8	124.5	118.1	127.6	53.5	53.2	60.2	77.4
1998	47.0	13.8	0.0	0.0	10.1	102.2	147.4	122.0	148.1	98.9	26.4	2.4	59.9
1999	2.1	3.1	12.9	79.6	41.5	68.4	201.5	152.0	136.4	165.3	28.5	1.2	74.4
2000	10.9	7.7	11.7	41.4	74.5	106.6	96.7	198.2	92.9	53.6	69.8	152.4	76.4

Sources: 1977 through 1995 from ESPR Data Response 157 (ESPR 2002c); 1996 through 2001 from El Segundo Generating Station Effluent Monitoring Data submitted to Regional Water Quality Control Board (ESPR 1996, 1997, 1998, 1999, 2000b) Bolded Values are above the permitted limit; inconsistent with other data and may represent a data entry error.

For the five-year period preceding the filing of this AFC (i.e. from January 1996 through December 2000 when this AFC was filed at the Energy Commission), the average daily flows at Units 1 and 2 ranged between 58.2 mgd and 77.4 mgd. Over the entire five year period, the daily flow rates for Units 1 and 2 averaged 69.2 mgd, which is approximately one-third of the of 207 mgd for which the Applicant is now seeking approval for the proposed project. Moreover, if the proposed project is not certified by the Energy Commission, it is reasonably foreseeable that average daily flow rates for the existing Units 1 and 2 will decline towards zero as the economic dispatch of these aging and inefficient units declines, and/or as these old units are retired completely to avoid expensive air quality control retrofits and other maintenance costs otherwise required for continued operation of these units.

Potential biological impacts to marine resources from the *operation* of the ESGS Power Redevelopment Project once-through cooling system may occur as the result of: (1) entrainment; (2) impingement; and (3) temperature effects resulting from the thermal discharge of the cooling water. Specifically, “*entrainment*” refers to the process by which organisms are drawn into and through the cooling water system, and “*impingement*” refers to the trapping of organisms on the screens of the intake system.

As discussed further below, staff finds that entrainment, impingement and thermal impacts from the proposed once-through cooling water system will cause adverse environmental consequences to marine organisms, and these adverse impacts may be significant, both directly and cumulatively. The Applicant has provided unsound scientific information and analysis concerning the magnitude of the entrainment impacts of the proposed once-through cooling system, and no such valid entrainment analysis presently exists for this project. Staff concludes that the unmitigated biological entrainment, impingement and thermal impacts of the proposed project will be adverse and potentially significant, both directly and cumulatively.

B. Direct Entrainment Impacts

For the reasons stated below, staff concludes that direct entrainment impacts resulting from the once-through cooling system of the proposed ESGS project will be adverse to marine organisms, and may cause significant adverse impacts.

The proposed project will transfer up to 207 million gallons per day (mgd) of ocean water from the Santa Monica Bay, through a 2,500 foot long-10-foot diameter pipe tunnel, into a large forebay where the water will then be drawn into the generating units for cooling purposes. Fish and other marine organisms will be entrained through the large intake tunnel into the forebay and, because of the strong currents generated by the intake, they will not be able to escape back into Santa Monica Bay. Most of the larger organisms subsequently entrained into the cooling system for the generating units will be killed during periodic heat treatments. Any marine organisms remaining alive in the forebay will be permanently lost to the ocean because they simply cannot escape back out through the lengthy conduit.³

³ Fish that swim or are sucked into the conduit are drawn into the forebay and cannot swim out against the strong conduit velocity of 4.1 fps. The long intake tunnel (approximately 2,500 feet) at ESGS, coupled with these strong currents, is particularly problematical for fish. At power plants that have very short

(1) The Need For Sound Entrainment Studies

Since there will be adverse entrainment impacts to marine organisms from the proposed once-through cooling system, carefully designed scientific studies are needed to properly determine the magnitude of these adverse entrainment impacts. Scientifically sound studies must employ proper data collection and analysis methods, as further described below.

- ***Sound Sample Collection and Identification Methods***

In addition to adult fish and macroinvertebrate losses, billions of fish eggs, larvae and planktonic invertebrates also are lost when they become entrained into the cooling water system. A great deal of scientific effort has been expended in recent years to design studies to understand the impacts to aquatic organisms of entrainment in the once-through cooling water systems of coastal power plants. In order to evaluate entrainment losses, it is critical to obtain: (1) an accurate estimate of the concentration (number of organisms per cubic meter) of planktonic organisms in the ocean water actually circulated through the cooling water system; and (2) an accurate estimate of the total source water populations from which these entrained organisms are drawn.

In ocean waters, planktonic organisms are patchy both in space and in time. Small-scale differences in oceanographic circulation patterns can lead to significant differences in plankton organism concentrations, even at locations that are very near to each other. Planktonic organisms also differ in their location in the water column leading to differences in concentration between near-bottom, mid-depth and near-surface water depths. Furthermore, on a daily basis, planktonic organisms undergo vertical migrations in the water column leading to significant differences in concentration between night and day. Many planktonic species are seasonal in their distribution and concentration varies greatly throughout the year. Fish larvae, in particular, show strong seasonal patterns, and the larvae of some species only may be in the plankton for a brief time, in some cases a few days.

Therefore, in order to obtain an accurate estimate of the number of organisms lost to entrainment in the intake of a coastal power plant, a comprehensive sampling program must be designed that takes into account the extreme variability of planktonic organisms. The standard scientific collection protocol in recent studies of power plant entrainment impacts consists of samples taken in front of the actual ocean water intake location (e.g., in front of the “vertical riser” in this case) every four hours over a 24-hour period on at least a bi-weekly basis for an entire year. Nets are towed in such a way as to obtain a representative sample throughout the water column. (See, for example, Tenera Environmental Services 2000a and 2000b).

In the current standard scientific protocol, after samples are properly collected in the field they are then taken to the laboratory where organisms are sorted from the debris and identified to the lowest possible taxonomic level. The goal is to identify organisms to the “species” level if possible, i.e. to the specific type of fish or invertebrate entrained.

intakes, fish may be able to swim against the currents at the intake and entrainment losses may be minimal. This is simply not the case at El Segundo.

For example, white croaker, queenfish, topsmelt and jacksmelt are each examples of entirely separate fish species.

The ability to identify fish larvae to the species level has advanced greatly in the past 20 years. These advances in fish larvae identification are one of several reasons that more recent entrainment studies have produced more accurate estimates of actual entrainment impacts than studies done in the 1970s.⁴

- **Sound Impact Assessment Methodologies**

In recent entrainment studies three analytical techniques have generally been used to evaluate losses. These techniques are the Empirical Transport Model (ETM), Adult Equivalent Loss (AEL) and Fecundity Hindcasting (FH) (for example, see Tenera 2000a). Each analytical approach is described further in the following paragraphs.

The ETM includes (1) an estimated number of entrained larvae, (2) an estimated number of larvae in the source water population at risk of entrainment, (3) an estimated time period that the larvae are vulnerable to entrainment, and (4) a calculation of the volume of source water affected. By comparing the number of larvae estimated to be withdrawn by the power plant to the number estimated to be in the source water, an estimate of proportional mortality due to entrainment can be generated for each taxon or species. These estimates of proportional mortality are then combined using the ETM to provide an estimate of the annual probability of mortality due to entrainment for each species.

Entrainment losses also can be estimated from total larval entrainment at the intake using AEL and the FH models. These models require life stage and species-specific estimates of age, growth, fecundity, and survivorship. AEL estimates the loss to adult standing stock by converting larval losses to future adult fish. This is done by estimating survivorship from the point of capture to maturity. FH estimates the number of females that would have produced the lost larvae by hindcasting from the point of capture back to the number of females. Using survivorship functions from the point of birth to the point of capture, the number of newly born individuals that would have been necessary to produce the lost larvae is calculated. This value is converted to females by dividing by the average fecundity per female.⁵

⁴ The identification of small planktonic animals is difficult, and in some cases it is not possible to separate one species from another. In these situations, the scientist identifies the organism to the lowest taxonomic level that he can. In the case of fish larvae, identification can sometimes only be made to the "family" level. Families include groupings of similar types of related fish. For example the croaker family (Sciaenidae) includes white croaker, queenfish, yellowfin croaker, black croaker and white sea bass. The silverside family (Atherinidae) includes grunion, topsmelt and jacksmelt.

The problem with identifying the organisms collected in entrainment samples only to the "family" level is that impacts to individual species are often obscured. For example, in recent times white sea bass (*Atractoscion nobilis*) have declined severely (due to overfishing and natural causes). If their larvae can only be identified at the family level (i.e. as croaker larvae), it cannot be determined how many larvae of this very vulnerable species are being lost to entrainment compared to the larvae of other members of the croaker family that are far more common. Therefore, whenever possible, sound scientific protocol calls for identification at the "species" rather than the "family" level.

⁵ In theory the formula is presented as $2FH = AEL$. However, in practice this equation may not be completely accurate because of uncertainty or errors in accurately estimating survivorship or fecundity.

Of these models, the ETM is considered especially useful in assessing entrainment impacts because it can (1) provide highly reliable impact estimates based on the proportional mortality of targeted larval species actually collected and analyzed; (2) provide reasonably robust estimates of the proportional mortality of *all* organisms in the source water body; and (3) convert reliable larval loss rates into habitat equivalencies (a measure of the amount of aquatic habitat lost due to entrainment). Moreover, relative to the AEL model and the FH model, the ETM model is less reliant on knowing the survivorship curves and fecundity of the target species.

(2) Deficiencies In Applicant's Entrainment Data And Analyses

- ***No Entrainment Analyses At The ESGS Intake***

*No analysis of the actual entrainment impacts of the ESGS has ever been done using estimates of larval concentrations determined by actually sampling at the ESGS intake in accordance with standard scientific protocols.*⁶ Instead, to predict the effects of entrainment and impingement by the intake, the Applicant has presented the results of several "proxy" studies that attempt to estimate entrainment impacts at the ESGS based on samples taken from locations other than the ESGS intake itself.⁷

- ***Deficiencies In The 1982 Ormond Beach "Proxy" Study***

In 1982 a study was completed by Southern California Edison (SCE) to comply with Section 316(b) requirements of the federal Clean Water Act (SCE 1982a). This 316(b) study was part of a demonstration for all SCE power plants with intakes in offshore Southern California marine and protected harbor waters, including ESGS. Instead of measuring entrainment impacts directly at each individual facility, the "proxy" study attempted to estimate entrainment impacts for each facility by studying "representative" sites and applying those results to all facilities with similar intake structures.

SCE decided that its Ormond Beach Generating Station was the "representative" site for entrainment sampling for a group of physically similar intakes into which ESGS was classified. The Ormond Beach Generating Station is in the City of Oxnard in Ventura County, approximately 55 miles north of ESGS. The intakes at both Ormond Beach and ESGS are located in a shallow nearshore zone of the Southern California Bight, and both generating facilities utilized similar cooling water intake structures (including velocity caps to reduce fish impingement).

⁶ The Los Angeles Regional Water Quality Control Board (LARWQCB) did not collect or possess any entrainment data collected directly at the ESGS intake site when it renewed the NPDES permit for existing Units 1 and 2 in 2000, and it has never collected, possessed or analyzed such direct entrainment data for that facility. (LARWQCB 2002a).

⁷ On August 5, 2002, the State Water Resources Control Board (SWRCB) submitted written comments on behalf of itself and all nine California Regional Water Quality Control Board's to the federal EPA. These comments, concerning proposed federal regulations for existing cooling water intake structures, stated that "[r]ates for impingement and entrainment are site specific" and "the only way to accurately characterize them" would be on a site-specific basis. The SWRCB went on to state that "regulatory agencies will probably not find estimated [entrainment] rates based on other sites to be acceptable." (SWRCB 2002, at page 5).

However, the 1982 Ormond Beach proxy study did not demonstrate that ESGS and Ormond Beach were, in fact, biologically similar. The primary problem with the 1982 316(b) proxy study for ESGS is that entrainment losses were estimated from samples collected at a location far from the actual location of the ESGS intake. Therefore, their accuracy as estimates for ESGS is unknown, at best, and is probably quite poor at worst.⁸

Furthermore, sampling for the proxy study was done 22 years ago. The composition of nearshore fish and plankton organisms off Southern California has changed dramatically since that time.⁹ A study of entrainment losses in 1982 is no more relevant to entrainment losses in 2002 than a traffic study done 20 years ago would be to evaluating traffic impacts of a project to be constructed in 2002.

Finally, in light of the standard scientific techniques used for more recent studies, the sampling done at Ormond Beach in 1979-1980 was such that even the analysis of entrainment impacts at Ormond Beach itself was probably inaccurate. For example, plankton samples were only collected monthly, not bi-weekly. Therefore, the peak abundance of fish species whose larvae spend a short time in the plankton may have been missed. In addition, entrainment was estimated by sampling at the velocity cap using a pump. This method has been found to *underestimate* the concentration of entrained larvae (Intersea Research Corp. 1981). Moreover, the powerful ETM, developed in recent years to determine impacts, was not used. Instead, a model similar to AEL (i.e. dependent on life history information and standing stock estimates) was used to assess impacts. Because models like the one used in the Ormond Beach study require life history and standing stock information that may not be accurate for many species, their use as a tool for impact determination may not be reliable.

- ***Deficiencies In The 1981 Scattergood “Proxy” Study***

The Applicant also has submitted a study done in 1978 and 1979 by the Los Angeles Department of Water and Power (Intersea Research Corp. 1981) to analyze the entrainment and impingement impacts of the Scattergood Generating Station located approximately 2,500 feet north of ESGS at a similar water depth (- 30 feet MLLW). While this study was completed for a facility much closer to the ESGS intake than Ormond Beach, it is unknown whether small scale differences in ocean circulation and currents within the area would make the concentration of plankton subject to entrainment at the Scattergood intake different than at the ESGS intake. In addition, the fact that the study was done over 20 years ago, and that coastal fish communities and populations have changed significantly since that time, also presents a significant problem and makes the study unrepresentative of what entrainment impacts currently may be.

⁸ Mean daily entrainment at the Ormond Beach Generating Station was determined from monthly samples collected from August 1979 through July 1980. Mortality of entrained larvae was assumed to be 100%. “Proxy” estimates of entrainment at the ESGS intakes were then developed by applying a flow rate adjustment to daily entrainment observed at the Ormond Beach Generating Station intake system.

⁹ See, for example, Roemmich and McGowan 1995, Herbinson et al. 2001, Love, Caselle and Van Busskirk 1998.

There are a number of other serious scientific problems in relying on the Scattergood study as a “proxy” for ESGS. For example, plankton samples at Scattergood were taken by pump at the velocity cap in front of the Scattergood intake and within the forebay. Samples also were taken by plankton net about 50 meters from the intake (near-field) as well as at two more distant stations (far-field). For a given sampling period, there was generally poor correlation in fish larval concentrations between the different locations sampled.¹⁰ The result is that most fish larval concentration estimates used in the Scattergood analysis are highly unreliable. In fact, the Scattergood report itself expressly states that for most of the species analyzed the entrainment estimates are “unrealistic” and “should be treated with caution.”¹¹

Furthermore, in the Scattergood study only a few kinds of fish larvae were identified to the “species” level, making it generally impossible to predict impacts on individual species. Many fish larvae were only identified to the “family” level. For example, the authors mention that many of the larvae only assigned to the croaker family (Sciaenidae) may be larval queenfish too small to identify to the “species” level. Therefore, the concentration estimates of queenfish may be underestimates because the smaller larvae may not be included.

In addition to the problems described above, the Scattergood report expressly states that the concentrations and kinds of planktonic organisms found at the near-field stations did not reflect the kinds and abundance of organisms found at the velocity cap and forebay (Intersea Research Corp., 1981, pp. 7-12 through 7-16). The authors explain this by noting that sampling by plankton net (as was done for the near-field samples) tends to integrate out the patchy distribution of plankton, but that sampling with a pump from a discrete depth (as was done to estimate entrainment) has a much lower probability of sampling the most dense stratum of the water column. *Because*

¹⁰ The plan was to estimate entrainment, in part, by computing the loss of organisms between the velocity cap and the forebay. However, analysis of field data indicated that velocity cap counts were often significantly less than forebay concentrations suggesting that the sampling of plankton by pump at the velocity cap *underestimated* plankton concentration. The authors attempted to correct for this problem by adjusting the samples at the velocity cap by a sampling bias coefficient that adjusted concentration estimates from samples taken at the velocity cap by a correction factor based on samples taken in the forebay. However, there is no way to determine whether the forebay samples represented accurate concentration estimates.

¹¹ The Scattergood authors considered their entrainment estimates to be reliable for only one species (white croaker) and one family (Engraulidae). For example, the Scattergood report states:

“An estimated 4.7×10^7 larvae [of the silverside species] were entrained during the survey year. Owing to the limited amount of data, this projection should be treated with caution.” (page 6-203)

. . . .

“During the entire one-year study period, approximately 1.8×10^8 queenfish larvae were entrained. Owing to the limited amount of data, projection could be unrealistic.” (page 6-204)

. . . .

“Approximately 2.7×10^7 scianid larvae [unidentified croaker larvae] were entrained during the year. Lack of data make this projection somewhat unrealistic.” (page 6-204)

. . . .

“Annual entrainment of turbot larvae [*Pleuronichthys* spp.] was estimated at 7.0×10^5 for the study year. Lack of data make this projection unrealistic.”

accurate concentration estimates are essential to evaluate the impacts of entrainment, the lack of reliable concentration estimates in the Scattergood study makes that analysis of little use in predicting the actual impacts of entrainment by the ESGS intake on aquatic resources even though the projects are not far from each other.

Finally, as was true of all the earlier studies, the most powerful model, ETM, for impact assessment had not yet been developed and, therefore, was not used in the Scattergood study.

- **Deficiencies In The 1997 Scattergood “Update” Study**

In 1997, MBC Applied Environmental Sciences attempted to “update” the 1978-1979 Scattergood Generating Station study (MBC 1997). The MBC document evaluated the entrainment and impingement impacts of the Scattergood Generating Station using updated impingement data and an updated analysis of fish stocks.

However, to estimate entrainment impacts the 1997 MBC study did not use more recent field data, but instead used the entrainment analysis from the original 1978-1979 Scattergood 316(b) study. Because the entrainment data were collected in 1978-1979, they are highly unlikely to be representative of the number of organisms currently entrained by the Scattergood intake. Also, as mentioned above, the concentration estimates used in that earlier analysis were unreliable and, thus, the estimates of entrainment impacts are of little value in the Scattergood “update.”

Furthermore, the estimate of standing stock identified in the 1997 Scattergood “update” document may have overestimated the population of many of the target fish species in Santa Monica Bay, thus underestimating the impact of power plant losses.¹² As just one example of the likely magnitude of overestimate of fish populations produced by this method, the Scattergood update (MBC 1997) estimates the standing stock of California halibut in Santa Monica Bay alone as between 12 and 50 million fish. In comparison, trawl surveys for California halibut conducted in the early 1990s produced an estimate of only 3.9 million California halibut for the entire Southern California coast (Kramer and Sunada 2001).

¹² The estimate of Santa Monica Bay standing stock for each species in the 1997 Scattergood update was based on trawls mostly done at a depth of 15 meters or less (ESPR 2002a). (Of 128 trawls used in the analysis, 84 of the 128 were done at a depth of 15 meters or less, the shallow waters where most target fish species are most abundant. Only 20 trawls out of 128 were at 20 meters depth or greater. The deepest depth sampled was 60 meters from which 4 trawls were included in the analysis.) However, to estimate standing stock the mean densities of target fish species in these trawls were extrapolated out to a depth of 90 meters where most of these species are less abundant than in shallow water. With the possible exception of pelagic species such as northern anchovy and Pacific sardine, most of the target species are most abundant at very shallow depths, i.e. less than 15 meters. For example in trawls off Redondo Beach, Love et al. (1986) caught 17,393 queenfish, 1,668 white croaker and 620 California halibut in trawls at 6.1 meters depth and 5,724 queenfish, 1,613 white croaker and 550 California halibut in trawls at 12.2 meters depth. In comparison only 1,125 queenfish, 265 white croaker and 356 California halibut were caught in trawls at 18.3 meters depth). Even though standing stock estimates were extrapolated out to 90 meters, no trawl catches from any depth greater than 60 meters were used in the analysis (ESPR 2002a Data Response 147). In short, the standing stock estimates in the 1997 Scattergood “update” study appear to be overestimated, and the adverse impacts of entrainment underestimated.

- ***Deficiencies In The Supplemental King Harbor Report***

Since the AFC was filed and data adequacy was completed in early 2001, the Energy Commission staff has repeatedly informed the Applicant that a determination of the effects of the ESGS intake based on entrainment studies done years ago at other locations is not a sound scientific basis for assessing what the current impacts of the ESGS intakes actually are. There were and are many reasons for staff's concern, as we have explained in the previous subsections, including the fact that populations of target fish species in the Southern California Bight have changed significantly in the last two decades.¹³

In response to staff's concerns, the Applicant decided not to do a 316(b)-like study (as has been done at all other recent Energy Commission coastal plant siting cases) but instead elected to submit another "proxy" analysis (ESPR 2001a) that used more recent ichthyoplankton data collected at the entrance to King Harbor (approximately five miles away in Redondo Beach), in combination with the estimate of the standing crop of fish stocks in Santa Monica Bay in the Scattergood 1997 update. There are many serious scientific defects in using the King Harbor report, including those specified below.

First, although King Harbor is closer to the ESGS than Ormond Beach, it is still approximately five miles away. In addition, the "proxy" site is in a protected, highly modified harbor near the mouth of a submarine canyon. Therefore, the habitat sampled at King Harbor is quite different than the flat sandy bottom and open coast associated with ESGS.

Second, the collection methods used to sample fish larvae at King Harbor were not intended or designed to sample the larvae that may be subject to entrainment at a power plant intake. For example, the Applicant's Supplemental Report (ESPR 2001a, page 29) states:

"The velocity cap on the El Segundo intake structures is classified as 'overhang', and therefore intake water is taken *from the mid water column and near bottom.*" (emphasis added)

However, the data from King Harbor, collected for an entirely different purpose than estimating ichthyoplankton entrainment, consists of samples over half of which were collected from near the surface of the water column. Of particular concern is the fact that only surface tows were taken at night, because larval entrainment appears to be greatest at night (SCE 1982b). Therefore, the concentration of larvae in the parts of the water column subject to entrainment (e.g. the mid-water and near bottom column) are under represented in the King Harbor data.

The King Harbor data collection problem is clearly illustrated in some of the information presented in the Applicant's report (ESPR 2001a). Figures D-3 and D-4 of that report compares the concentration of silverside species collected in King Harbor plankton tows with species entrained in the intake of the nearby Redondo Beach Generating Station

¹³ For example, a recent analysis indicates that populations of several species of croaker within the Southern California Bight may have experienced a long-term decline (Herbinson et al. 2001).

during the same period. Topsmelt was the species of silverside collected in highest abundance in the King Harbor tows. Few jacksmelt or grunion were collected in the King Harbor samples. However, entrainment surveys from the Redondo Generating Station during the same period collected primarily jacksmelt and grunion and few topsmelt.¹⁴

Third, the Applicant has simply not been able to demonstrate that concentrations of fish larvae in the King Harbor samples are the same as the concentrations of fish larvae at the ESGS intake. To compare the concentration of fish larvae in King Harbor with that at El Segundo, replicate tows were taken as close as possible to the ESGS intake structure on September 29, October 21 and November 21, 2000 (Pondella 2001). Replicate tows were taken on the same dates at a similar depth at the mouth of King Harbor. Only six out of the 14 fish taxa larvae collected in these sample sets were collected in both locations. Three species (black croaker, queenfish and slender sole) were collected at El Segundo, but not King Harbor. Five species were collected at King Harbor, but not at El Segundo. When species were found in both locations, the overall mean for the two locations for most taxa differed by at least an order of magnitude.

The great variability of this limited data set also makes comparison between the two locations difficult. Only 3 of the 6 taxa collected at both locations were numerous enough to compare the abundance at the two locations statistically. Of these three taxa, one (spotted kelpfish) was significantly more abundant at King Harbor than El Segundo. The mean concentration of white croaker and a complex of three goby species were not significantly different between the two locations. However, this lack of difference may be a statistical artifact of low power to detect differences. Even if the statistical comparison was robust, the similarity of the goby family concentrations between the two locations could be masking significant differences amongst individual

¹⁴ In Data Request 140 staff asked the Applicant to clarify the issue of whether the King Harbor samples were collected at depths that would be subject to entrainment by the El Segundo intake. The Applicant replied in Data Response 140 that, although the King Harbor stations did not sample all areas of the water column with uniform effort, the sampling reasonably describes the ichthyoplankton community at both sites (ESPR 2002b). As proof that the King Harbor data accurately represented the concentration of species subject to entrainment the Applicant pointed to the fact that there was high correlation between the King Harbor samples and samples taken from the nearby Redondo Beach Generating Station collected during the same period (1979-1980). However, the correlations presented by the Applicant only demonstrate that ichthyoplankton collected in the Redondo Generating Station intake showed the same *seasonal variability* as the ichthyoplankton collected in the King Harbor tows. In response to Data Request 135, the Applicant provided the estimated concentration of fish larvae from the 1979-1980 King Harbor plankton tows and the 1979-1980 Redondo Generating Station intake sampling. The concentration of larvae in the two data sets are very different. In addition to the differences in the species of atherinids discussed above, engraulid larvae were over *10 times* more abundant in the Redondo Generating Station intake samples compared to King Harbor, white croaker were *7 times* more abundant in the intake samples, queenfish were *9 times* more abundant in the intake samples, and diamond turbot larvae were almost *6 times* more abundant in the generating station intake samples compared to the King Harbor samples. In contrast, goby larvae were *4 times* more abundant in the King Harbor samples than in the intake samples and *Hypsoblennius* larvae were *5 times* more abundant in King Harbor compared to the intake. Therefore, the King Harbor plankton tows do not appear to provide representative concentrations of the species subject to entrainment. A number of species entrained in substantial numbers in the Redondo Generating Station intake were under represented in the King Harbor tows.

species. Thus, for this limited comparison, the concentration of only one species out of 14 collected was found to be similar between the King Harbor and the ESGS locations.

Because a more extensive data set on fish larvae concentrations near El Segundo was developed for the 1978-1979 Scattergood study (Intersea Research Corporation 1981), and because monthly ichthyoplankton samples from the same period are available from King Harbor, the Applicant proceeded to compare the concentration of fish larvae in the 1978-1979 Scattergood study to the concentration of fish larvae in King Harbor in 1978 and 1979 (ESPR 2001a). However, the fish larval concentrations in the two studies were not comparable. The Applicant's Supplement Report (ESPR 2001a, page 47) expressly states that:

“The collection methods were not the same between the King Harbor and Scattergood surveys, and direct comparisons of larval densities were not made.”

Because the Applicant could not demonstrate that the concentrations of fish larvae at King Harbor are the same as at El Segundo, and because an accurate estimate of the concentration of fish larvae in the water that is sucked through the intake is critical to the assessment of entrainment impacts, the analysis of ESGS entrainment impacts using King Harbor data simply does not provide the critical scientific information needed to determine the impacts of the ESGS intake.¹⁵

The Applicant attempts to avoid the very significant problem that the concentration of fish larvae at Scattergood and King Harbor were not similar by demonstrating that, for most fish taxa, there was a close *correlation* between the two data sets. However, the correlation merely shows that the concentration of larvae in King Harbor for a given fish species or family undergoes similar *temporal* increases and decreases as at the Scattergood Generating Station. However, this temporal correlation is a function of the biology of the species and does nothing to demonstrate that the *concentration* of fish larvae at King Harbor can be used as a surrogate to determine entrainment impacts at El Segundo. For example, a study of ichthyoplankton at several different locations throughout Southern California found that the seasonal peaks in larval abundance were the same for most fish species at each open coast site, but that the actual magnitude of concentrations sometimes differed dramatically from location to location (SCE 1982b). To provide a simple analogy, if one were to take daily measurements of the temperature at the top of Mt. Whitney and the floor of Death Valley, one would be able to demonstrate excellent correlation between the two data sets. For both locations, temperatures would be highest in summer and lowest in winter. However, no one would ever suggest that the Mt. Whitney temperatures could be used as a surrogate for Death Valley temperatures.¹⁶

¹⁵ In fact, the comparative concentrations provided by the Applicant in Data Response 135 suggest that for most of the species most common in the vicinity of ESGS (including white croaker, queenfish, silversides, anchovies, *Pleuronichthys* spp. and diamond turbot), the concentration in the Scattergood samples were many times the concentration in the King Harbor samples (ESPR 2002b).

¹⁶ In Data Response 139, the Applicant contends that when representative fish larvae collected offshore King Harbor were compared to collections offshore El Segundo during the periods 1978 to 1980 and 2000, they correlated at statistically significant levels (ESPR 2002b). However, as discussed in this Staff Assessment, the statistical correlation for the data collected in 2000 was only for one species and one multi-species family (Gobiidae). The sample set was small and the variability was great so the

In addition, the Applicant's Supplemental analysis appears to underestimate the impact of fish losses at the ESGS intake because it compares the losses to the standing stock estimates of fish populations in Santa Monica Bay developed for the 1997 Scattergood Generating Station update (MBC 1997). As discussed above, that analysis likely overestimates standing stocks of shallow water fish species in Santa Monica Bay.¹⁷ In addition, much of the data used in that analysis is from 1986 and 1988 and may no longer be representative of the current fish populations in Santa Monica Bay.

Finally, it should be noted that the Applicant's King Harbor analysis used the AEL model to determine impacts rather than the more powerful ETM. Because the Applicant's study relied on existing data not collected for the purpose of analyzing entrainment impacts, it did not have the appropriate field samples to run the ETM. The AEL has the weaknesses noted above, namely that it cannot accurately predict losses for species for which detailed information on age-specific mortality is unavailable and the determination of impacts relies on problematic estimates of the standing stock of each target species.

- ***Conclusion: Applicant's Entrainment Studies Are Inadequate***

In summary, no entrainment study involving sound scientific sampling at the ESGS intakes has ever been done. In addition, none of the "proxy" studies submitted by the Applicant to demonstrate that the intake will not have a significant impact on marine

statistical test had a low power to show differences. Furthermore, these data were collected in the fall when the abundance of larvae is low. The statistical correlation shown between the 1978-1979 King Harbor and Scattergood samples only showed similar seasonal fluctuations. This seasonal correlation did not demonstrate that the magnitude of the fish concentrations were similar for the two sample sets, and, in fact, when the Applicant finally provided the data, the magnitude of fish concentrations were very different. Because it is the magnitude of the *concentrations* that is relevant to the analysis of entrainment impacts, the demonstrated seasonal correlation does not answer the question as to whether King Harbor concentrations are a reliable surrogate for the concentration of fish larvae off El Segundo.

¹⁷ In Data Response No. 151, the Applicant stated "While many species collected in impingement samples at the generating station can be considered primarily nearshore dwellers, several abundant species have more extensive distributions and may undergo inshore-offshore migrations." (ESPR 2002a). As examples, the Applicant identified three pelagic species including northern anchovy, Pacific sardine and jack mackerel as well as queenfish. For queenfish, the Applicant states that the species is distributed from the surface to 55 meters depth, and yet the queenfish standing stock estimates used by the Applicant extrapolate abundance estimates, primarily from trawls done at depths shallower than 15 meters, out to a depth of 90 meters. In Data Response No. 151, the Applicant does not address the standing stock estimates of such species as white croaker, California halibut, yellowfin croaker and many other species that are clearly more abundant in shallow water. Of the three examples of pelagic species given by the Applicant in Data Response 151, only northern anchovy standing stock was estimated based on trawls in Santa Monica Bay. Jack mackerel standing stock was not estimated. Standing stock of Pacific sardine as well as topsmelt, jacksmelt and salema were based on samples taken in San Diego Bay. In Data Response No. 152, the Applicant admits that there are no data to compare the standing stocks of pelagic species in San Diego Bay to Santa Monica Bay (ESPR 2002c). Therefore, the Applicant has no basis for using San Diego Bay samples to estimate standing stocks of species in Santa Monica. Furthermore, staff believes these species are likely to be more abundant in San Diego Bay than in Santa Monica Bay. San Diego Bay is an enclosed embayment protected from wave surge, thus providing a benign environment. Santa Monica Bay, on the other hand, is exposed to waves. Furthermore, much of San Diego Bay supports eelgrass beds. Eelgrass beds support a higher abundance of fish than comparable non-vegetated soft-bottom areas (Hoffman 1986, Allen 1995). In short, by using San Diego Bay samples to estimate standing stocks of pelagic species in Santa Monica Bay, the Applicant may have overestimated Santa Monica Bay standing stocks of these species and, thus, underestimated impacts.

resources provides a scientifically reliable estimate of the number of organisms that would be entrained by ESGS. Without this information, there is no sound scientific basis for concluding that the magnitude of the direct impacts of entrainment to nearshore fish and macroinvertebrate populations at ESGS is not significant.

(3) Direct Entrainment Impacts May Be Significant

There are many valid reasons to be seriously concerned about the significance of the direct adverse entrainment impacts of the proposed ESGS project.

First, the actual amount of water to be withdrawn from Santa Monica Bay and entrained by the proposed ESGS project is not trivial. The 1978-1979 Scattergood study found that at maximum pumping rates the Scattergood facility withdrew about 4.4% of the shallow water volume of central Santa Monica Bay during a six-week period of time (Intersea Research Corporation 1981). The permitted intake volume for the new ESGS units will be 207 mgd, approximately 42 percent of the permitted intake volume of Scattergood. Therefore, based on the analysis done during the Scattergood study, the new ESGS units alone will withdraw almost 2% of the estimated shallow water volume of central Santa Monica Bay every six weeks. In the absence of sound scientific evidence to the contrary, it is reasonable to conclude that *on a volumetric basis alone* the proposed ESGS may cause significant adverse impacts to the marine organisms of Santa Monica Bay, even if there were no other facilities causing similar adverse impacts nearby.¹⁸

Second, recent entrainment studies done at several California coastal power plants (Moss Landing, Morro Bay, Diablo Canyon, San Onofre) have all found significant adverse impacts to local marine resources. These new studies have detected significant direct impacts at Moss Landing and Diablo Canyon even though previous studies done in the late 1970s at these facilities had concluded that the intakes were not having a significant adverse effect on marine organisms.¹⁹

¹⁸ Sound scientific entrainment studies recently conducted at other California coastal power plant sites (e.g. Moss Landing and Diablo Canyon), have found that actual proportional mortality losses were significantly *greater* than the percentages simply derived from volumetric source water calculations alone.

¹⁹ At Diablo Canyon, a power plant located along the open coast off Central California, the recent study used the Empirical Transport Model to quantify the impacts of the intake (Tenera 2000b). The results of the analysis indicated that the best estimate of the loss of productivity due to the power plant intake was equivalent to the loss in production of 7.75 miles of open coast habitat from the shoreline out to nearly 2 miles offshore, an area of 9,920 acres.

At the San Onofre Nuclear Generating Station off the open coast of Southern California, an Adult Equivalent Loss Model was used to estimate the number of adult fish that would have been produced from the larvae lost to entrainment in the power plant intake (Murdock, et al., 1989). This analysis determined that the intake losses were equivalent to 13% of the queenfish, 6% of the white croaker, and 5% of the California grunion populations of the entire Southern California Bight. Other fish species, for which insufficient life history information is available to run the Adult Equivalent Loss model, likely suffered similar impacts. Locally, within about 2 miles of the San Onofre Nuclear Generating Station, the density of queenfish and white croaker in shallow-water samples decreased by 34% and 36% respectively after Units 2 and 3 of the San Onofre Nuclear Generating Station began commercial operations (USEPA 2001). These effects were determined by the California Coastal Commission to be significant and SCE was required to mitigate for the losses.

Third, as the Energy Commission expressly noted in its recent “Environmental Performance Report” to the Legislature in July 2001:

- “The damage to aquatic biological resources continues at coastal power plant sites using once-through cooling” (and)
- “Repowering or expanding power plants at existing coastal and bay side sites will perpetuate significant impacts on aquatic ecosystems through the continued use of once-through cooling water systems.” (Energy Commission Report P 700-01-001, July 2001, at page ES iii.)

Third, the direct entrainment impacts of the ESGS Power Redevelopment Project may be significant because, as discussed below in the Cumulative Impacts section, many of the resources affected by the intake have declined measurably in the last 20 years.

In short, based on the best evidence now available in this matter, if the proposed ESGS project is certified without substantial mitigation to its once-through cooling system, staff concludes that the project may cause significant direct adverse entrainment impacts to the marine organisms in Santa Monica Bay.

C. Direct Impingement Impacts

For the reasons stated below, impingement from the proposed ESGS project will add direct, potentially significant, adverse impacts.

Adult fish losses at ESGS will result from impingement of fish on the intake screens of the cooling water system. In addition to fish losses due to impingement, many macroinvertebrates such as crabs and lobsters also will be killed each year due to impingement at ESGS.

The maximum biomass of adult fish impinged at all ESGS units between 1979 and 1999 was 3.88 tons per year, and the mean for these 20 years was 1.33 tons per year) (MBC 1999). Between 1979 and 1983, when Units 1 and 2 and Units 3 and 4 were operating at close to maximum capacity, the mean fish biomass impinged per year was about 3.33 tons (MBC 1999).

Power demand from the ESGS decreased after 1984 when new units from the San Onofre Nuclear Generating Station began operating.²⁰ However, fish and invertebrate impingement is expected to increase after construction of the ESGS Power Redevelopment Project. It is likely that with implementation of the ESGS Power Redevelopment Project, cooling water demands for power generation at ESGS would be similar to the levels in the early 1980s, and that annual fish impingement will again increase to the higher levels noted in 1979-1983.

²⁰ Fish impingement is related to flow rate, although other factors also may be important, especially the length of the intake tunnel. The annual volume for Units 1 and 2 and Units 3 and 4 in 1999 was 104,430 million gallons, which equals a mean daily flow of 385 million gallons per day (mgd), and the combined fish impingement for all units was 0.38 tons comprising 1,330 individual fish (ESPR 2000a). Invertebrate impingement was 36,113 animals with a total biomass of about 3 tons.

While the total direct tonnage of fish and invertebrates impinged by the proposed project may not be significant in and of itself, impingement is clearly additive to the other direct adverse biological impacts which this project will cause. For the reasons stated earlier in this report, the direct adverse biological impacts of entrainment are potentially significant, and the direct adverse impingement impacts of the project will simply add to this result, since impingement affects the same fish species and families that are adversely impacted by entrainment as well.

D. Direct Thermal Discharge Impacts

For the reasons stated below, thermal discharges from the proposed ESGS project will add direct, potentially significant, adverse biological impacts.

The volume of heated water to be discharged from the proposed project is expected to increase significantly from the levels actually discharged by existing Units 1 and 2 at the time the AFC was filed. Table 4, above, shows the average monthly flow of Units 1 and 2 between May 1977 and December 2000. Flows through the Units 1 and 2 intake have decreased dramatically since the early 1980s, and during the past 5 years the yearly average daily flow has been only about one-third the permitted daily flow volume of 207 mgd. The new units will essentially become baseload units for the ESGS. The baseload units are projected to increase in operational days per year compared to the existing operational days for Units 1 and 2. The increase in volume of the new units will result in an overall increase in volume for the ESGS cooling water system.²¹

Ocean water surface temperatures in Santa Monica Bay range from approximately 52 to 63 degrees Fahrenheit (F) in the winter and 61 to 73 degrees F in the summer (MBC 1994). The permitted discharge temperatures for Units 1 and 2 and Units 3 and 4 are not to exceed 105 degrees F (ESPR 2000a). The AFC states that the maximum thermal loading from the El Segundo Power Redevelopment Project will be less than the maximal thermal loading from Units 1 and 2 (ESPR 2000a). According to the AFC, during peak power generation and worst-case ocean temperatures, the maximum discharge temperature of existing Units 1 and 2 are 93 degrees F. Table 5 shows intake and discharge temperatures measured at ESGS during recent monitoring when Units 1 and 2 were operating at less than maximum capacity. These data suggest that when units are operating at close to maximum capacity, as Units 3 and 4 did during the summers of 1997, 1998, and 1999, the temperature difference between the intake and the discharge is between 15 and 20 degrees F.

²¹ This increase will probably be offset somewhat by a decrease in operational days per year for Units 3 and 4. The AFC projects that the total mean daily flow for both outfalls after implementation of the Redevelopment Project will be 421 mgd (ESPR 2000a). However, the potential exists for ESGS to discharge heated water at its maximum permitted volume of 607 mgd.

**Biological Resources Table 5:
Intake and Discharge Temperatures at the Existing ESGS Outfalls
(1997-1999)**

Date & Season	Outfall	Intake Temp. (°F)	Discharge Temp. (°F)	Flow Rate (mgd)
Feb. 24, 1999 (Winter 1999)	Units 1 & 2	60.08	60.98	0.07
	Units 3 & 4	62.06	71.06	162.5
Aug. 13, 1999 (Summer 1999)	Units 1 & 2	66.92	86	103.7
	Units 3 & 4	68	82.94	398.6
April 10, 1998 (Spring 1998)	Units 1 & 2	63.32	N/A	0
	Units 3 & 4	63.32	67.46	168.4
Aug. 11, 1998 (Summer 1998)	Units 1 & 2	69.98	84.02	103.7
	Units 3 & 4	68.72	87.26	389.3
April 28, 1997 (Spring 1997)	Units 1 & 2	57.02	62.06	51.8
	Units 3 & 4	57.02	74.48	194.8
July 29, 1997 (Summer 1997)	Units 1 & 2	60.08	63.14	194.8
	Units 3 & 4	59.9	79.52	398.6

Source: ESPR 2000a

To provide estimates of the thermal plume characteristics after construction of the ESGS Power Redevelopment Project, a two-dimensional modeling analysis was conducted. The details of that analysis are discussed in the **Soil and Water Resources** section of this Supplemental Staff Assessment. Under the conditions used in the model simulation, an area of about 800 acres was elevated by 4 degrees F from the combined thermal discharges of Units 3 and 4 and Units 5, 6 and 7. The 4 degrees F temperature rise isotherm was predicted to intersect the beach over a length of 2,000 to 3,000 feet. The modeling results indicate that the thermal plume would violate the California Thermal Plan requirements for a new discharge. These requirements specify that the discharge of elevated temperature wastes shall not result in increases in water temperature exceeding 4 degrees at the shoreline or the ocean surface beyond 1000 feet from the discharge. A much smaller area (less than 40 acres) was elevated 10 degrees F above the ambient ocean temperature, and this area of larger temperature rise did not reach the beach.

In addition to the discharge of heated water as a result of power plant operations, the Applicant proposes to conduct "heat treatments" to eliminate fouling organisms that grow within the cooling water system. During these treatments, the flow of the cooling water is temporarily recirculated (thus increasing the temperature) and reversed so that the normal "discharge" point becomes the intake, and the normal "intake" point becomes the discharge point. Heat treatment typically is conducted every six weeks and lasts for about six hours per conduit. During heat treatment the highest permitted discharge temperature is 125 degrees F (except during gate adjustment) for two hours. During gate adjustments, which control the temperature of the water recirculated in the intake and discharge points during the heat treatment, the discharge temperature can be increased up to 135 degrees F for no more than 30 minutes. During heat treatments, fish and invertebrates living in the intake unit and forebay are killed, impinged on the screens and then removed from the forebay.

Except for individuals trapped by currents within the forebay of the intake during heat treatments, fish and mobile invertebrates will avoid water temperatures that are above their thermal tolerance. An elevation in ocean water temperature of 4 degrees F or less generally is within the natural range of ocean water temperatures in Santa Monica Bay and would be expected to be within the tolerance level of most marine organisms.²² Therefore, in and of itself, the thermal effects of the proposed project on marine life are expected to be insignificant, and direct thermal discharge impacts on other biological resources are also expected to be insignificant.²³

However, some plankton organisms, which have limited mobility, may be carried into the area of high temperatures surrounding the outfall and would not be able to avoid water temperatures above their tolerance limits. The impacts to plankton of exposure to extreme temperatures will clearly add to the direct adverse impacts of entrainment and impingement cause by the intake. Viewed additively, the direct impacts of the proposed project's entire once-through cooling system (including the thermal impacts) may be significant.

SITE PREPARATION AND CONSTRUCTION IMPACTS

For the reasons stated below, no significant adverse biological impacts are expected from site preparation and construction of the proposed ESGS project.

The proposed project includes construction of a 630 MW, combined cycle power plant within the footprint of two existing units that will be demolished. The new combined cycle unit will consist of two combustion turbine generators (CTGs), two heat recovery steam generators (HRSGs) and one steam turbine generator (STG). Heat rejection for

²² The 1973 ESGS Thermal Effects study noted only minor differences between the biological communities near the ESGS outfalls and the control (Benson et al. 1973). Fewer species of fish were found near the outfalls compared to the controls, although the total number of individual fish was actually greater near the outfalls. Two species, the white seaperch (*Phanerodon furcatus*) and the walleye surfperch (*Hyperprosopon argenteum*), were significantly more abundant at the control than the outfalls. These data suggest that some species of fish may avoid the area around the outfalls. The 1973 study as well as annual monitoring of invertebrates in the vicinity of ESGS has noted few differences between the benthic community around the intake and discharge structures and control areas (Benson et al. 1973, MBC 1997, 1998, 1999).

²³ For example, the Venice Beach colony of the State and Federal Threatened California least tern is dependent on an adequate prey base of small fish in the vicinity of the colony. Although least terns from the Venice Beach colony probably forage occasionally in ocean waters near the ESGS, the ESGS outfall is sufficiently distant (4 miles) from this colony, that the thermal discharge would not be expected to have a significant effect on least tern foraging.

Other sensitive seabird species, such as the endangered California brown pelican, that forage in nearshore waters near ESGS also would not be expected to suffer a significant impact from the increased discharge. Any thermal effects on fish populations would be limited to a relatively small area in the immediate vicinity of the discharge plume.

Federally Threatened western snowy plovers forage on the beach near ESGS. The thermal discharge plume from ESGS would not be expected to elevate temperatures in the intertidal zone to the extent that there would be any effects on the invertebrate prey of snowy plovers. The Thermal Effect Study for the ESGS (Benson et al. 1973) did not find that there was a reduction in sandy beach organisms near the power plant compared to transects further away. Therefore, the discharge would not be expected to affect the prey base of the western snowy plover.

the STG will utilize the de-aerating, steam surface condenser connected to an existing ocean-circulating water system that was used by the two existing conventional steam power plants to be demolished. For the reasons stated below, no significant adverse biological impacts are expected from site preparation and construction of the proposed ESGS project.

Since all ESPR construction activities will take place on land, no construction-related impacts to marine resources are anticipated. Existing ESGS power generators will be replaced with improved equipment. To do so, a landscaped embankment between the east side of the ESGS facility and Vista Del Mar Boulevard may be graded, but will be restored with similar ornamental vegetation following construction. Because the plant site is void of native biological resources, construction activities would not result in significant impacts to such resources.

Any noise generated during power plant construction will cause little impact to wildlife, as those animals that occur in the area have become adapted to current noise levels. Also, no state or federally listed species are known to occur adjacent to the current power plant that would be affected by current and anticipated power plant noise levels.

Two 215-foot high stacks will replace the two existing 210-foot high exhaust stacks on site. These structures may present a collision hazard to birds, especially migrating waterfowl or other insectivorous species that migrate at night. The Federal Aviation Administration has issued a "Determination of No Hazard to Air Navigation" for the ESPR Project and as a condition of the Determination, the exhaust stack structures must be marked and/or lighted in accordance with FAA requirements (ESPR, 2002c, Data Response 157). Birds may confuse constant or intermittent red or white lights with constellations that may guide their flight. Fog or low clouds can further add to the potential for bird collisions. The number of bird collisions in the area are presumed to be high given the surrounding industrial facilities. Although records of bird collisions are not maintained by plant operators, anecdotal information indicates that collisions are not a problem at ESGS (ESPR, 2000a, AFC, page 5.6-31). The contribution of the two replacement stacks to bird mortalities from collisions is not expected to be significantly greater from existing impacts, given the small, 5-foot difference in height between the existing and replacement stacks. The Applicant will select lighting fixtures and arrangements with consideration for minimizing potential collision hazards while maintaining Federal Aviation Administration safety standards (ESPR, 2002c, Data Response 157). In considering the likelihood that the ESPR Project will not increase the bird collision hazard, along with the need for safety considerations staff believes that this impact will not be significant.

In summary, no significant adverse biological impacts are expected from site preparation and construction of the proposed ESGS project.

CUMULATIVE IMPACTS

For the reasons stated below, the cumulative impacts of the proposed ESGS project will cause significant adverse impacts on marine organisms.

Section 15130 of the CEQA Guidelines requires a discussion of cumulative environmental impacts when they are determined to be potentially significant. Cumulative impacts are defined as those impacts created by the project evaluated in conjunction with other projects causing similar impacts. The CEQA Guidelines require that the discussion reflect the severity of the impacts and the likelihood of their occurrence, but need not provide as much detail as the discussion of the impacts attributable to the proposed project alone.

The CEQA Guidelines also provide two different ways in which cumulative impacts are to be evaluated. One of these approaches is to summarize growth projections in an adopted General Plan or in a prior certified environmental document. The second method involves compilation of a list of past, present, and probable future projects producing related or cumulative impacts. The second method has been utilized for the purposes of this Staff Assessment.

SIGNIFICANT CUMULATIVE MARINE IMPACTS

Initially, it is important to recognize that the adverse marine impacts of the proposed project's cooling water intake system on nearshore fish populations in Santa Monica Bay will act cumulatively with similar adverse impacts occurring at the other Santa Monica Bay power plants that draw water from the ocean for their cooling water systems. In addition to the ESGS, there are two other power plants that draw cooling water from the ocean in southeast Santa Monica Bay. These nearby power plants are the Scattergood Generating Station, located approximately 2,500 feet to the north of ESGS, and the Redondo Generating Station, located approximately 5 miles to the south.

As noted earlier, on a local level the actual amount of water to be withdrawn from Santa Monica Bay by the proposed project is not trivial. In the 1978-1979 Scattergood study, investigators calculated that at maximum pumping rates the Scattergood facility withdrew about 4.4% of the volume contained in the six-week estimated shallow water volume of central Santa Monica Bay (Intersea Research Corporation 1981). The nearby ESGS intakes will have combined permitted daily flow levels similar to those at Scattergood. Together, these two power plants may withdraw close to 10% of the shallow waters containing the marine organisms living in central Santa Monica Bay. In the absence of sound scientific evidence to the contrary, it is reasonable to conclude that the proposed ESGS, in combination with other existing facilities now operating nearby, will cause significant adverse impacts on the marine organisms of Santa Monica Bay.

Second, the cumulative adverse impacts of coastal power plant intakes on marine resources are particularly important because Southern California zooplankton biomass and many nearshore fish species have declined dramatically since the 1970s. Roemmich and McGowan (1995) demonstrated that the biomass of macrozooplankton in waters off Southern California has decreased by 80 percent since 1951. This loss represents a loss of productivity to the base of pelagic food chains as well as a loss of the larvae of fish and macroinvertebrates. The decline in Southern California zooplankton appears to be related to a warming trend that has occurred in Southern California ocean waters since the late 1970s. However, the substantial cropping of

plankton organisms by coastal power plant intakes is clearly adding to the losses of an important component of the ecosystem that already is in sharp decline.

Many Southern California nearshore fish species, subject to impingement and entrainment at power plant intakes like ESGS, also have declined since the 1970s. Herbinson et al. (2001) showed by analyzing power plant impingement data that the abundance of six croaker species, white croaker, yellowfin croaker, black croaker, California corbina (*Menticirrhus undulatus*), white sea bass and spotfin croaker (*Roncador stearnsi*), have declined in Southern California since 1977.²⁴

Several species of nearshore rockfish (Family Scorpaenidae) also have declined in Southern California since at least the late 1970s. Based on an analysis of commercial passenger fishing vessel rockfish catch in the Southern California Bight between 1980 and 1996, Love, Caselle and Van Buskirk (1998) demonstrated a substantial decline in the overall catch per unit effort during that time. Among the several species with particularly large declines were bocaccio (*Sebastes paucispinis*) (98.7% decline), blue rockfish (*Sebastes mystinus*) (95.2% decline), and olive rockfish (*Sebastes serranoides*) (83% decline). Love, Caselle and Herbinson (1998) found similar declines in the impingement of rockfish on Southern California power plant intakes between 1977 and 1993. Bocaccio, olive rockfish, and blue rockfish, the species with the severest declines, were amongst the species most frequently impinged in power plant intakes.

Other nearshore fish species including sheephead (*Semicossyphus pulcher*), cabezon (*Scorpaenichthys marmoratus*) and various species of surfperch also have declined in recent years (Holbrook et al. 1997, CDFG 2000, Marx 2000). Most coastal power plants have recorded a decline in impingement since the early 1980s (MBC 1999). The drop in impingement is related partially to lower power demand at many plants since the new units of the San Onofre Nuclear Generating Station began operations in 1984, but also may reflect the lower abundance of many nearshore fish species.²⁵ The report submitted by the Applicant (ESPR 2001) contains graphs showing fish larval densities in King Harbor between 1974 and 1998 based on the long-term King Harbor ichthyoplankton data set. That information demonstrates declining trends in the larval abundance of silversides, northern anchovy, white croaker, queenfish, rockfish, and blennies.

These well-documented declines in coastal fish populations are due to a variety of factors. El Nino warming events in the late 1970s, early 1980s, and again in the 1990s, have clearly had an adverse impact on many species and also appear to be related to the decline in Southern California zooplankton biomass. For some species, including most of the rockfish, overfishing has taken a heavy toll. The cumulative impacts of power plants using once-through cooling in Santa Monica Bay clearly add to this toll.

²⁴ The biomass, but not the abundance, of a seventh species, queenfish, declined during the same time period.

²⁵ For example, when documenting the decline of several species of croaker, Herbinson et al.. (2000) adjusted for impingement levels at power plant intakes by the flow of each power plant. The results suggest that reductions in impingement levels in recent years is related to lower fish abundances not just lower flows.

Third, it is important to note that under Section 303(d) of the Clean Water Act, Santa Monica Bay has been listed as an impaired water body for several pollutants including heavy metals, debris, pesticides, polyaromatic hydrocarbons, and polychlorinated biphenyls. The USEPA has expressed concern that cooling water intakes potentially contribute additional stress to waters already showing aquatic life impairment from other sources such as industrial discharges and urban stormwater (USEPA 2001). Substantial cropping of larval and adult organisms by coastal power plant intakes, thus, directly and cumulatively adds to the losses of coastal resources already stressed by ocean warming trends, overfishing, and pollution.

Fourth, as noted earlier, in its recent “Environmental Performance Report” to the Legislature in July 2001, the California Energy Commission itself made two important findings that are highly relevant to this matter. In that report, the Commission expressly found that:

- “The damage to aquatic biological resources continues at coastal power plant sites using once-through cooling” (and)
- “Repowering or expanding power plants at existing coastal and bay side sites will perpetuate significant impacts on aquatic ecosystems through the continued use of once-through cooling water systems.” (Energy Commission Report P 700-01-001, July 2001, at page ES iii.)

Finally, the Applicant has not provided an adequate analysis of the cumulative impacts of this project. The cumulative analysis submitted by the Applicant analyzed cumulative impacts simply by scaling the permitted volume of all three Santa Monica Bay cooling water facilities by the estimate of fish losses predicted for the ESGS Units 1 and 2 intake (ESPR 2001a).

The problem with the Applicant’s analysis is that it uses the unreliable ichthyoplankton concentration estimates from King Harbor to predict entrainment impacts. In addition, it uses recent impingement data from the Units 1 and 2 intake to predict impingement losses at the other intakes. However, because Units 1 and 2 have been operating far below their permitted capacity, impingement at this intake has been much less than at the other intakes. For example, in 1999, only 166 fish were impinged on the ESGS Units 1 and 2 intake compared to 1,184 at the ESGS Units 3 and 4 intake and 40,804 at the Scattergood Generating Station intake (MBC 1999). Furthermore, the Applicant evaluated the impact of these cumulative losses using estimates of the standing stock of each species in Santa Monica Bay that likely overestimates the standing stock of shallow water fish species. Finally, the analysis failed to use the more powerful tools, AEL, FH and ETM, to analyze cumulative impacts. Therefore, the cumulative analysis provided by the Applicant likely underestimated the cumulative impacts of the three Santa Monica Bay generating station intakes.

In Data Response 155, the Applicant reanalyzed cumulative impacts using the Adult Equivalent Loss Model and actual impingement data from each of the Santa Monica Bay intakes (ESPR 2002b). However, again the analysis relied on the concentration estimates from King Harbor samples to predict entrainment impacts and the impacts again were compared to standing stock estimates that likely overestimated the standing stocks of target species in Santa Monica Bay. Because the concentration estimates

may not have represented the concentrations of fish larvae subject to entrainment at ESGS and Scattergood or even at the Redondo Generating Station (see Footnote 1), the analysis cannot predict accurately the cumulative entrainment impacts of power plants in Santa Monica Bay. Because the standing stocks of fish probably were overestimated, the cumulative impacts likely were underestimated.

The total permitted capacity of these three generating stations is approximately equal to the permitted capacity of the San Onofre Nuclear Generating Station. Given the significant impact the San Onofre Nuclear Generating Station was found to have on nearshore fish in the entire Southern California Bight as well as the profound local effects (Murdoch, et al., 1989), staff believes that it is likely that the three generating stations are having a significant cumulative impact on the nearshore fish of Santa Monica Bay and are contributing to significant Bight-wide impacts.

In short, based on the evidence now available in this matter, if the proposed ESGS project is certified without substantial mitigation to its once-through cooling system, staff concludes that the project will cause significant cumulative adverse biological impacts to marine organisms in Santa Monica Bay and the Southern California Bight.

NO SIGNIFICANT CUMULATIVE AIR EMISSION IMPACTS

Populations of the federally protected El Segundo blue butterfly and its habitat could be indirectly affected by air emissions from the upgraded power plant. In a recent study for the San Francisco Peninsula, Weiss (1999) found that increased nitrogen levels in the air, as a result of automobile emissions and other sources, could raise nitrogen deposition levels in nearby nitrogen-poor serpentine grasslands, encouraging the growth of introduced, annual grasses (*Lolium* sp., *Bromus* sp. and *Avena* sp.) at the expense of native plants (*Plantago erecta* and *Castilleja densiflora*). These native plants are essential to the Bay checkerspot butterfly, another federally listed Threatened butterfly.

The habitat and essential host plant for the El Segundo blue butterfly are quite different than the San Francisco Peninsula and the Bay checkerspot butterfly. There are no nitrogen poor serpentine soils or serpentine grasslands in the vicinity of the ESPR Project, and coastal buckwheat (*Eriogonum latifolium*), a coastal sandy dune species, is the essential food plant for the El Segundo blue butterfly. However, there is research, albeit limited, to support the idea that changes in other nutrient poor soils that support vegetation types like coastal sage scrub may alter plant species composition (Allen et al. 1998) and therefore, this impact might also be applicable to dune and other coastal soil types that are low in nutrients.

Air modeling results for all nitrogen emission sources located on the proposed ESPR Project site indicate that maximum nitrogen deposition levels (in kilograms of nitrogen per hectare per year, kg N/ha-yr) adjacent to the ESGS facility could be 4.47 kg N/ha-yr., though deposition rates are reduced to approximately 0.2 kg N/ha-y at the perimeter of the detectable range (ESPR 2000a, AFC, Figure 5.6-10, ESPR 2001b, Data Response 161) that overlaps with the Chevron Preserve and the El Segundo Dunes Preserve. The modeled scenario presumed worse operating conditions at full load for Units 3, 4, 5 and 7. This represents 1.5 percent of the 1994 levels of nitrogen

deposition reported for Long Beach (13.46 kg N/ha-yr.; Blanchard et al., 1996) that were considered as a reasonable background estimate for the El Segundo area (ESPR 2000a, AFC, 5.6-30). The dunes at Malaga Cove (7 miles to the south) will not be affected by air emissions from the ESGS because at this distance the contribution of the plant to nitrogen deposition is negligible. Weiss (1999) estimated impacts to the serpentine habitats considered in his study at 10-15 kg N/ha-y. The United States Forest Service has developed a generic significance level of 3 kg N/ha-y for shrub and herbaceous vegetation in Class I wilderness areas²⁶. Above this level it is projected that vegetation will be injured (Peterson et al. 1992).

It is important to consider that total NO_x emissions from ESGS will be reduced by 99 tons per year with the new turbines (ESPR 2000a, AFC, Table 5.2-4) and therefore, the power plant's contribution to N deposition in the Chevron Preserve and El Segundo Dunes Preserve (LAX site) will be less under the future operating scenario. In addition, the spatial loss of the El Segundo sand dunes habitat to urbanization reached its maximum in the 1970s. The other dune habitats, including restorable sites, cannot be further developed at this time because of legal constraints, safety, or geological hazard. Together these sites are sufficient to maintain El Segundo Blue populations indefinitely, given current habitat quality. This viability analysis is based on potential habitat area and topography that could support annual adult populations in the order of 100,000 individuals. Habitat management is critical to maintaining the quality of remaining habitat. Control of exotics to promote the success of coastal buckwheat, the El Segundo blue butterfly's essential host plant, is a part of management efforts at the El Segundo Dunes Preserve (Mattoni 1998).

Populations of the El Segundo blue butterfly under the present environmental conditions in the preserves, therefore, appear to be stable with management efforts directed at maintaining habitat quality. Although there is no site-specific information available to link soil quality and the availability of host plants for the El Segundo blue butterfly with air quality, under future conditions it is likely that NO_x emissions from ESGS would not contribute to negative significant effects on the butterfly's habitat.

LORS COMPLIANCE

As explained below, the ESGS project, as now proposed, does not comply with several applicable laws concerning protection of biological resources.

Under Public Resources Code section 30413(d) of the California Coastal Act, the California Coastal Commission must determine whether the proposed project conforms to the policies of the Coastal Act and must specify provisions necessary to ensure conformity. The Coastal Commission has found that the project as currently proposed

²⁶ These USFS values are applied to Class I wilderness areas defined as those with more than 5,000 acres that were in existence as of August 7, 1977, or any later expansions made to these wildernesses. They were derived in order to comply with provisions of the Clean Air Act of 1977. However, the values themselves are generic condition classes set for ecosystem impacts to different vegetation types in California and can ostensibly be used for other areas. At levels less than those defined above, no injury is expected. Injury in this case is defined broadly at the ecosystem level to collectively include processes such as plant metabolism and deposition effects on vegetation structure and diversity.

does not conform to Coastal Act policies related to marine resources (CCC 2002). The Coastal Commission has determined that the proposed project will not be operated in a manner that maintains, enhances, or restores marine resources as required pursuant to Coastal Act Sections 30230 and 30231. The cooling water is drawn from Santa Monica Bay, which has been listed as impaired, and therefore the Coastal Commission has determined that the project, as currently proposed, is not likely to support sustained biological productivity in coastal waters as required pursuant to Coastal Act Section 30230. Because the Applicant has not provided adequate information to determine the magnitude of entrainment impacts, the Coastal Commission states that it has been precluded from determining specific provisions that could bring the proposed facility into conformance with the applicable Coastal Act policies. Therefore, Energy Commission staff finds that, at the current time, the project does not conform with the California Coastal Act.

Similarly, because of the lack of any sound entrainment and impingement study, the National Marine Fisheries Service (NMFS) has found that it cannot make the specific recommendations required under Section 395 (b)(4)(A) of the Magnuson-Stevens Fishery Management and Conservation Act to conserve essential fish habitat (NMFS 2002). Under these circumstances, the NMFS has recommended that prior to licensing the Applicant complete an entrainment and impingement study similar to those done at the Moss Landing, Morro Bay, Diablo Canyon and Potrero power plants, and if that study finds significant impacts, mitigate for those impacts (NMFS 2002).²⁷ Thus, the Energy Commission staff finds that the project as currently proposed is not in compliance with the Magnuson-Stevens Fishery Conservation and Management Act.

Finally, the LARWQCB has determined that: (i) the proposed project will be allowed to operate under existing NPDES Permit No. CA0001147 until June 29, 2005; and (ii) the project is currently in compliance with existing EPA 316(b) guidelines now in effect. However, the LARWQCB has expressly noted the concerns raised about project entrainment impacts by the Energy Commission staff, the California Coastal Commission, the California Department of Fish and Game, the National Marine Fisheries Service, and others, and the LARWQCB has "has no objection if the CEC elects to make additional factual and legal determinations on [the entrainment impacts] issue pursuant to [the Energy Commission's] responsibilities under the California Environmental Quality Act (CEQA) and the Warren Alquist Act." (LARWQCB 2002b).

MITIGATION

APPLICANT'S PROPOSED MITIGATION MEASURES

The Applicant has proposed in Section 5.6.3 of the AFC to stipulate to and accept several standard Energy Commission Conditions of Certification that apply to protection of sensitive biological resources. However, staff notes that with the exception of the three bulleted items below, many of the Applicant's proposed mitigation measures are

²⁷ Similarly, the California Department of Fish and Game has recommended that prior to licensing this project, the Applicant be required to conduct a minimum 1-year, site specific, study to determine the project's entrainment and impingement impacts (CDFG 2002).

not applicable to the proposed ESGS, and appear to have been copied from another project (La Paloma Generating Project 99-AFC-2, Kern County). Some of the measures are not applicable to the site because the activities or facilities referenced in them will not be undertaken for this project (e.g. employing a Designated Biologist). Others reference standard industry practices and are relatively inconsequential (e.g., avoiding sensitive species, site hygiene and prohibition of hunting).

In addition to the measures summarized above, the Applicant proposes the following three mitigation measures that are relevant to biological resources at the site:

- Impacts to ornamental vegetation on the cut-slope on the north side of the existing ESGS facility will be mitigated by landscaping this area following disturbance;
- The existing cooling water intake structure with its velocity cap will be maintained and the Applicant will continue to monitor and report fish impingement and the presence/absence of the federally listed Endangered green sea turtle in the vicinity of the intake structure, as required under the current program; and
- The Applicant will initiate a pilot project to investigate the feasibility of removing fish prior to heat treatment through deployment of a modified beach seine to scoop fish out of the forebay of the cooling water system, prior to heat treatment, and return the fish to the ocean.

STAFF'S PROPOSED MITIGATION MEASURES

The Applicant's proposed mitigation measure to continue to monitor and report fish impingement is a requirement of its National Pollution Discharge Elimination System (NPDES) permit and is not considered mitigation. The Applicant's proposed measure to scoop fish out of the forebay prior to heat treatments might not be feasible or, if feasible, might not reduce significantly fish mortality.

Staff has determined that project-specific impacts from entrainment and impingement may be significant and that cumulative impacts from entrainment and impingement are significant. None of the studies submitted by the Applicant are scientifically adequate to determine the current impacts of the ESGS intake. An updated analysis of impingement and entrainment effects of the cooling water system intake needs to be done to determine the extent of the direct adverse impingement and entrainment impacts on the marine resources of Santa Monica Bay. This analysis should also consider the cumulative impacts of other Santa Monica Bay power plants that withdraw cooling water from the Pacific Ocean.²⁸ Until a scientifically valid study of ESGS impingement and entrainment effects is done, staff cannot recommend specific mitigation measures for

²⁸ Staff's requirement that current field data be provided by the Applicant so staff can complete its impacts analysis is consistent with other coastal power plant projects (Moss Landing, Morro Bay, Huntington Beach Retool, and Potrero Unit 7) that have recently been certified or are currently before the Commission for certification. Staff believes that an updated analysis using current data from ESGS to determine the actual impingement and entrainment losses of the ESGS Power Redevelopment Project and the cumulative effect of the three Santa Monica Bay power plants needs to be undertaken soon. The California Department of Fish and Game (CDFG 2002a), the California Coastal Commission (CCC 2002), and the National Marine Fisheries Service (2002a & 2002b) support staff's recommendation that updated entrainment surveys are needed to assess the project's current impacts.

this project, other than to abandon once-through cooling altogether or deny approval of the project in its entirety.

If the use of water from Santa Monica Bay for once-through cooling were eliminated from the project, the adverse entrainment and impingement impacts would be eliminated as well. Accordingly, staff conducted a study of alternative cooling options at the conceptual design level, with input from the Los Angeles Departments of Public Works, and Water & Power, West Basin Municipal Water District, the Applicant, and the City of El Segundo. The study, presented in Appendix A, shows that the use of reclaimed water from the Hyperion Wastewater Treatment Plant is both technically and economically feasible. Therefore, staff recommends that the Applicant consider amending the proposed project to employ the reclaimed water alternative cooling technology evaluated in Appendix A or other alternative cooling option that would eliminate the use of sea water for once through cooling. Adoption of the recommended alternative or other alternative would eliminate the adverse biological impacts and LORS compliance problems of the project as now proposed.

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

Staff concludes that the direct entrainment, impingement and thermal discharge impacts from the proposed once-through cooling water system will be adverse and potentially significant, and that these impacts will cause significant cumulative impacts on the resources of Santa Monica Bay and the Southern California Bight. In addition, the project as now proposed appears to violate several applicable LORS, including provisions of the California Coastal Act and the federal Magnuson-Stevens Fishery Management and Conservation Act. Staff has identified numerous serious concerns regarding the information that Applicant has provided in support of its conclusion of no significant adverse biological impacts from the once-through cooling system, including the following:

- The daily flow from the proposed project will increase by as much as 3 times the average daily flow existing at the time the AFC was filed, and therefore adverse marine losses will significantly increase as well.
- The populations of many of the fish species most vulnerable to impingement and entrainment at ESGS have declined dramatically in recent years. Therefore, the proposed ESGS project will affect fish populations already highly stressed from a variety of factors.
- No sound scientific studies of entrainment at the ESGS intakes have ever been done.
- The entrainment studies at other intakes presented by the Applicant do not provide adequate scientific data to evaluate ESGS entrainment impacts for several reasons:
 1. Distance --The abundance of plankton subject to entrainment varies greatly from one location to another. Therefore, the abundance of plankton sampled at a location

other than ESGS cannot be used as a substitute to quantify entrainment losses at ESGS.

2. Time --All of the entrainment studies presented by the Applicant were done 20 or more years ago. The abundance of target fish species in Southern California has changed substantially in these past two decades. Conclusions about the significance of impacts from studies done prior to 1980 are unlikely to still be valid.
 3. Methodology --The methodology and techniques for collecting and analyzing entrainment losses have advanced considerably in recent years. The entrainment studies presented by the Applicant have flaws in sampling and analysis that make their conclusions problematic.
- Because of the lack of current entrainment studies for ESGS, the Applicant attempted to use recent fish larvae data from King Harbor (5 miles from ESGS) to evaluate ESGS entrainment impacts. However, this exercise was unconvincing because the Applicant could not demonstrate that the concentration of fish larvae at King Harbor was similar to the concentrations at El Segundo. In fact, the data supplied by the Applicant suggested that the King Harbor data underrepresented target fish species likely to be entrained at ESGS.
 - The Applicant's analysis contended that impingement and entrainment impacts at ESGS were insignificant because the number of fish lost to the intake every year was a very small percentage of the standing stock of each of the target species in Santa Monica Bay. However, the Applicant appears to have overestimated standing stocks and therefore underestimated the impacts of the intake.

Staff concludes that there will be no significant impacts to terrestrial biological resources, including federal or state endangered or threatened species.

RECOMMENDATIONS

Staff recommends that the Energy Commission license the project only with mitigation that avoids or significantly reduces the adverse biological impacts from the use of water from Santa Monica Bay for once-through cooling. Because of the lack of the sound scientific information on entrainment impacts that would be needed to develop appropriate mitigation, staff cannot recommend approval of the project as proposed at this time. Until a scientifically valid study of ESGS impingement and entrainment effects is completed, staff cannot recommend specific mitigation measures for this project, other than to abandon the use of water from Santa Monica Bay for once-through cooling altogether, that would reduce the impacts to less than significant levels.

Staff recommends that the Applicant consider amending the proposed project to employ the reclaimed water alternative cooling technology evaluated in Appendix A or other alternative cooling option that would eliminate the use of sea water for once through cooling. While such an amendment would require additional analyses to analyze potential impacts associated with that alternative, it would avoid entirely both the significant environmental impacts of the project as proposed and the delays necessary to complete the additional studies on entrainment and impingement impacts needed to develop appropriate mitigation.

If the Applicant chooses not to revise its proposed cooling system to eliminate the adverse biological impacts, staff recommends that this project not be approved until the Applicant provides additional information on the biological impacts of the project. Staff recommends that the Applicant complete an updated analysis of entrainment and impingement impacts based on a one-year field survey similar to the recent 316(b) studies that have been done at the Moss Landing, Morro Bay, Diablo Canyon and Potrero power plants. The study should be overseen by an independent working group of technical experts. If the Applicant decides to conduct a 316(b)-like study, staff is willing to provide input on study design and analysis methods to insure that the study employs methodology determined to be the best available science to evaluate entrainment impacts. Following the study, all feasible mitigation needed to eliminate any significant adverse impacts will be required.

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BIOLOGICAL RESOURCES APPENDIX A EL SEGUNDO POWER REDEVELOPMENT PROJECT COOLING OPTIONS REPORT

INTRODUCTION

PURPOSE OF REPORT

The El Segundo Generating System (ESGS) has been operating as an electric generating station since May 1955. The facility currently consists of four gas-fired, conventional electric power-generating units. The proposed El Segundo Power Redevelopment (ESPR) project would involve the complete demolition and removal of Units 1 and 2 on the project site, except for the steam cycle heat rejection system that utilizes water from Santa Monica Bay. Upon completion of the demolition and removal of Units 1 and 2, a new combined cycle power plant would be constructed on the site with the addition of Units 5, 6, and 7 in the location previously occupied by Units 1 and 2. No changes to the existing Units 3 and 4 are proposed in this Application for Certification (AFC) process. A combined-cycle configuration would be established with the addition of heat recovery steam generators to exhaust outlets of the Unit 5 and 7 combustion turbines and the addition of the Unit 6 steam turbine generator.

Currently, the cooling water supply for the ESGS is provided by two separate ocean intakes from Santa Monica Bay. One existing ocean intake serves Units 1 and 2 (Outfall No. 001) and another serves Units 3 and 4 (Outfall No. 002). Units 3 and 4 would continue to use the second existing seawater intake (Outfall No. 002) to provide cooling water.

The proposed once-through cooling system for the ESPR project would use large quantities of water, pulling cool water from the Santa Monica Bay and returning almost all of the water, warmed, to the Bay. This analysis of cooling options for the ESPR project was undertaken because staff has identified potentially significant impacts to aquatic biological resources that would result from the proposed use of once-through cooling.

This report analyzes the feasibility and potential impacts of once-through cooling using secondary treated reclaimed water. Hybrid cooling and the use of tertiary treated water for once-through cooling were evaluated in the draft of this report published June 17, 2002. Based on comments from local jurisdictions and engineering concerns, these options have since been determined infeasible or to create significant impacts and have been removed from further analysis. The draft report also considered alternate discharge options that would use the ESGS existing discharge pipelines, but these options would be feasible only with use of tertiary treated wastewater.

AQUATIC BIOLOGY IMPACTS OF CONCERN

The ESPR project proposes to use up to 207 million gallons per day (MGD) of seawater for cooling. This water would be brought to the facility by an existing intake pipeline with its terminus 2,600 feet offshore. Staff has identified potentially significant direct and

significant cumulative adverse aquatic biology impacts from the once-through seawater cooling system at the ESPR project, related to entrainment and impingement by the intake, and the temperature effects of the thermal discharge. Staff's current analysis of these impacts is included in the **Biological Resources** section of this Final Staff Assessment (FSA) and is summarized below.

The volume of ocean water that the ESPR Project proposes to withdraw from Santa Monica Bay is approximately three times greater than the average volume being withdrawn at the existing intake when the AFC was filed with the Energy Commission. No biological impact analysis based on sound scientific sampling at the existing El Segundo once-through cooling system intake has ever been done, and none of the "proxy" studies, which were submitted by the applicant to demonstrate that the intake will not have a significant impact on marine resources, provide a scientifically reliable estimate of the number of organisms that would be entrained or impinged by the project.

The thermal effects of the proposed project on marine life, viewed in isolation, are expected to be insignificant, and direct thermal discharge impacts on other biological resources are also expected to be insignificant. However, some plankton organisms, which have limited mobility, may be carried into the area of high temperatures surrounding the outfall and would not be able to avoid water temperatures above their tolerance limits. The impacts to plankton of exposure to extreme temperatures will clearly add to the direct adverse impacts of entrainment and impingement cause by the intake. Viewed collectively, the direct impacts of the proposed project's entire once-through cooling system (including the thermal impacts) may be significant.

In addition, the adverse entrainment, impingement, and thermal impacts of the proposed once-through cooling system on nearshore fish populations in Santa Monica Bay would add to the adverse impacts of entrainment, impingement, and thermal discharge at the other Santa Monica Bay power plants (Scattergood Generating Station and Redondo Generating Station) that draw water from the ocean for their cooling water systems. Staff has determined that the *cumulative* impacts of the proposed project on marine resources would be significant.

DESCRIPTION OF THE COOLING SYSTEM EVALUATED

As a result of the aquatic biological impacts described above, this analysis of options to once-through cooling has been prepared. This report evaluates the environmental and engineering effects (including LORS compliance) of the use of reclaimed water (rather than seawater) for the once-through cooling system to cool the steam turbine. Treated reclaimed water would be provided from the West Basin Municipal Water District (WBMWD), from wastewater treated at the Hyperion Treatment Plant (Hyperion). The use of secondary treated water is evaluated, with the discharge of the cooling water to Hyperion for disposal through its existing offshore discharge pipe — the "five-mile outfall". The engineering and environmental effects of once-through cooling using reclaimed water are presented in Section 3, below. The use of reclaimed water in a once-through cooling system appears to be technically feasible and potential impacts are likely to be mitigable to less than significant levels.

REPORT CONTENTS

This report includes four sections that include the information shown below.

1. Introduction

Section 1 describes the purpose of the report and provides a brief description of the aquatic biology impacts of concern, the cooling system that is reviewed in this report, and the report contents.

2. Conceptual Design

Section 2 presents the conceptual design for the specific cooling option that could replace or enhance the once-through cooling system proposed for the ESPR project and that is considered in this report. This section presents a description of a secondary treated reclaimed water cooling system that could be used with once-through cooling, and also provides a brief discussion of other cooling options considered in the draft study that have been eliminated from further consideration.

3. Environmental and Engineering Analysis

Section 3 analyzes the environmental and engineering effects of the use of reclaimed water with once-through cooling for each of the issue areas that would be substantially affected (e.g., air quality, aquatic biology, visual, etc.).

4. Conclusion

Section 4 presents overall conclusions about the environmental and engineering effects of once-through cooling using reclaimed water.

CONCEPTUAL DESIGN

Thermal power plants convert fuels (such as natural gas) to electrical power and waste heat. In combustion turbines, or Brayton cycles, almost all the waste heat is rejected in the exhaust gases. In steam turbines, or Rankine cycles, waste heat is rejected in the flue gases and in the condenser/cooling system. Operation of the cooling system for steam turbines serves three purposes: (1) condensing steam into water to allow pumping of a liquid instead of compressing a gas to raise the feedback to the boiler to high pressures; (2) recycling of the water back to the boiler to optimize water use; and (3) minimizing the steam turbine exhaust temperature to maximize the output of the steam turbine. The temperature of the heat sink and the heat transfer efficiency of the cooling system affect the overall plant performance.

Steam turbine cooling can be achieved by using any of several current technologies. In once-through cooling, large quantities of water are used for cooling and the heated water is then returned to its source. Wet cooling towers use water and evaporative cooling, using less than ten percent of the water needed for once-through cooling. Dry cooling uses ambient air for cooling, and requires construction of large banks of elevated fans, almost eliminating water demand. Hybrid cooling combines elements of wet and dry cooling (evaporative cooling and fans) and can be configured in many different ways, all using less water than wet cooling systems.

In this study, dry cooling is not considered because it requires a large surface area for the banks of fans, and this space is not available at ESGS. Wet cooling is not evaluated

because wet towers create large vapor plumes in coastal climates. Hybrid cooling was evaluated and determined to be infeasible and so is not addressed in this report.

Wet or hybrid cooling can also use seawater rather than fresh or reclaimed water. Salt-water cooling towers are not evaluated in this study because the purpose of the study was to minimize impacts to the marine environment.

Therefore, this study considers only once-through cooling using reclaimed water rather than seawater.

GENERAL ISSUES RELATED TO ONCE-THROUGH COOLING USING RECLAIMED WATER

Historically, power plants have been built along the coast or on large rivers to make use of seawater or other open waters for cooling. Once-through cooling using open water has low capital and operating costs and potential for high power plant operating performance (i.e., lower temperature heat sink), so it is still favored by plant developers. In once-through cooling, water is drawn from a local source (e.g., the ocean), passed through the condenser tubes, and returned to the ocean at a higher temperature. Although large volumes of water are required, once-through cooling does not consume water; it uses the water briefly and returns the water to its source at an elevated temperature. Steam is condensed in a shell-and-tube condenser.

Existing once-through cooling power plants facilities utilize seawater or other open water sources for cooling. The use of reclaimed water for once-through cooling would not generally require additional equipment at the power plant itself. However, pipelines from a source of reclaimed water would need to be constructed and would need to connect to existing intake systems.

While reclaimed water is commonly used in hybrid cooling towers, staff is not aware of power plants that currently use reclaimed water for once-through cooling. Very few water treatment plants have capacity large enough that once-through cooling could be considered.

Advantages and Disadvantages of Once-Through Cooling Using Reclaimed Water

The following is a general list of the advantages and disadvantages of once-through cooling using reclaimed water.

Advantages of Once-Through Cooling Using Reclaimed Water

- Impingement and entrainment impacts on marine biological resources would be eliminated.
- Reclaimed water that would otherwise be directly discharged to the ocean would have a beneficial use prior to discharge.
- Secondary treated water used for cooling could be available to other users after its use for cooling.

- The provider of the reclaimed water (WBMWD, in this case) would presumably receive income from the sale of treated water to the plant operator.

Disadvantages of Once-Through Cooling Using Reclaimed Water

- Cooling efficiency would be less than with seawater because reclaimed water is warmer.
- Reclaimed water may not be readily available in all areas in the large quantities required, and the supply may not be as reliable a source as seawater even if sufficient quantities are identified.
- The volume of reclaimed water used will depend on economic optimizations, but is likely to be less than the volume of seawater proposed. This would result in a higher discharge temperature that, if discharged directly to the ocean, may result in increased thermal impacts to aquatic species, potentially raising questions concerning discharge requirements.
- The plant operator must purchase reclaimed water while seawater is available at no fiscal cost (though there is an environmental cost).
- Two additional large pipelines (connecting the power plant with the water treatment plant) must be constructed.

THE PROPOSED ESPR PROJECT

ESPR proposes to use 207 MGD from three potential sources at full operation. Nearly all of this water would be used for cooling the steam turbine condenser. Cooling water would be seawater drawn through the existing ESGS intake structure. Potable water would be purchased from the City of El Segundo, through purchases from the Metropolitan Water District (MWD) (about 0.18 MGD), and additional water would be purchased from the West Basin Municipal Water District (WBMWD) for irrigation of landscaping and other uses (about 0.086 MGD).¹

Once-through cooling with secondary² treated water from Hyperion is the alternative cooling method evaluated in this report for the ESPR Project. The water would be discharged via the existing Hyperion outfall. In the draft of this report staff also evaluated evaporative cooling (using a hybrid cooling tower) with reclaimed water and once-through cooling using tertiary treated water; however, these options were determined to be infeasible. The draft report also considered the option of discharge of cooling water through the existing ESPR discharge structure. This option has also been determined to be less desirable from cost perspective (since tertiary treated water would be required for discharge that close to the beach) and it would also have impacts on marine resources due to the relatively high discharge temperature.

¹ A conversion table is provided at the end of this report to allow conversion of flow volumes from gallons per minute (gpm) to millions of gallons per day (mgd) or acre-feet per year (afy).

² The process for secondary water treatment removes biodegradable organics and suspended solids, using chemical and/or biological processes.

Engineering Concerns Regarding Hybrid Cooling and the Use of Tertiary Treated Water

At the July 17, 2002, technical working group meeting, four involved parties (West Basin, Hyperion, the applicant, and RWQCB) discussed the cooling options under consideration. Several parties commented that hybrid cooling and once-through cooling using tertiary treated reclaimed water would be infeasible at the ESPR project. As a result, the environmental and engineering analyses that were included in the draft report have been deleted from this report; however, a brief description of each option is described below.

Hybrid Cooling

The hybrid cooling alternative consisted of a combination wet cooling tower with a dry section mounted on top for purposes of abating the visible vapor plume that would occur during periods of cool, high humidity weather. The concept of this design is to use the wet portion of the tower to provide a primary cooling source for the cooling water that is circulated through the plant condensers and then a dry portion to reheat the exiting air to a temperature above which a vapor plume will not form.

The physical impacts of hybrid cooling using reclaimed water in comparison to the once-through cooling system would primarily include: (1) increased operational noise; (2) installation of additional pipelines to transport reclaimed water; (3) increased facility bulk and visual impact; and, (4) modification and/or abandonment of the existing seawater intake structure.

Due to the potential visual impacts of the cooling towers and vapor plumes, and LORS conformance issues, the project as described could result in significant adverse impacts under CEQA, and non-conformance with Section 30251 of the California Coastal Act. From the land use perspective, the hybrid cooling alternative using reclaimed water may not have been consistent with the California Coastal Act consistency determination. As a result of these issues, the hybrid cooling option was removed from further analysis in the report.

Once-Through Cooling Using Tertiary Treated Water

Use of once-through cooling using tertiary treated water³ from Hyperion would require construction of a tertiary treatment facility and a pumping system at or near Hyperion as part of the ESPR project. The tertiary treatment facility could require a minimum of 10 to 20 acres of land. From this new facility, the treated reclaimed water would be pumped approximately one mile south to the power plant in a new pipeline.

The approximate cost of this option would be about \$250 million. This includes the cost of an approximately 5,000-foot pipeline (assuming a cost of \$1,000/foot), a tertiary treatment facility and pumping system as well as various business costs, permitting, etc. This estimated cost would be about 50 percent of the plant cost, which is not considered to be a reasonable project capital cost. The construction of a second parallel pipeline

³ Tertiary treated water is treated to drinking water standards, requiring additional treatment, including disinfection to kill any microorganisms that might cause disease. This disinfection can be done with chemical (e.g., chlorine) or physical (e.g., microfilters) processes or a combination of both.

and the use of secondary treated water would cost significantly less than the tertiary treatment option.

An additional cost factor would be the reclaimed water itself. The WBMWD reports that the “published rate” for tertiary treated water is \$200 to \$250 per acre-foot. At the lower expectation of 50 MGD, this would result in the use of 56,000 acre-feet per year (AFY). At \$200 per acre-foot, this would result in a cost of \$11.2 million per year. At 150 MGD, the cost would be about \$30 million per year. This is a substantial portion of the cost of the entire plant. Therefore, based on these costs, the use of tertiary treated water is considered infeasible.

CONCEPTUAL DESIGN OF THE ONCE-THROUGH COOLING SYSTEM USING RECLAIMED WATER

In order to evaluate the feasibility and potential impacts of eliminating the use of seawater for cooling, staff analyzed the use of reclaimed water from Hyperion. The conceptual designs presented here call for ESPR to take delivery of between 50 and 150 MGD of reclaimed water at Hyperion. Water use is reduced from the Applicant’s proposed 207 MGD because a higher discharge temperature has been assumed. In one studied option, this water could have been discharged directly from the existing power plant discharge and/or intake structures, but in the selected option it would be returned to Hyperion after its use for cooling. The potential impacts of the higher discharge temperatures on marine organisms are addressed in Section 3 of this report.

The City of Los Angeles’ Hyperion Treatment Plant treats sewage from the City’s collection system and provides secondary treatment. Treated water is then discharged at a point five miles offshore. The treatment capacity of Hyperion is 450 MGD and has a current flow of about 360 MGD that varies diurnally. The ESPR requirement (up to 150 MGD) would be 33 percent of Hyperion’s discharge capacity, and could potentially rise to 40 percent of Hyperion’s output during hot months of the year. Currently, six percent of Hyperion’s secondary treated water (28 MGD) is delivered for reuse to its only customer, West Basin Municipal Water District (WBMWD).

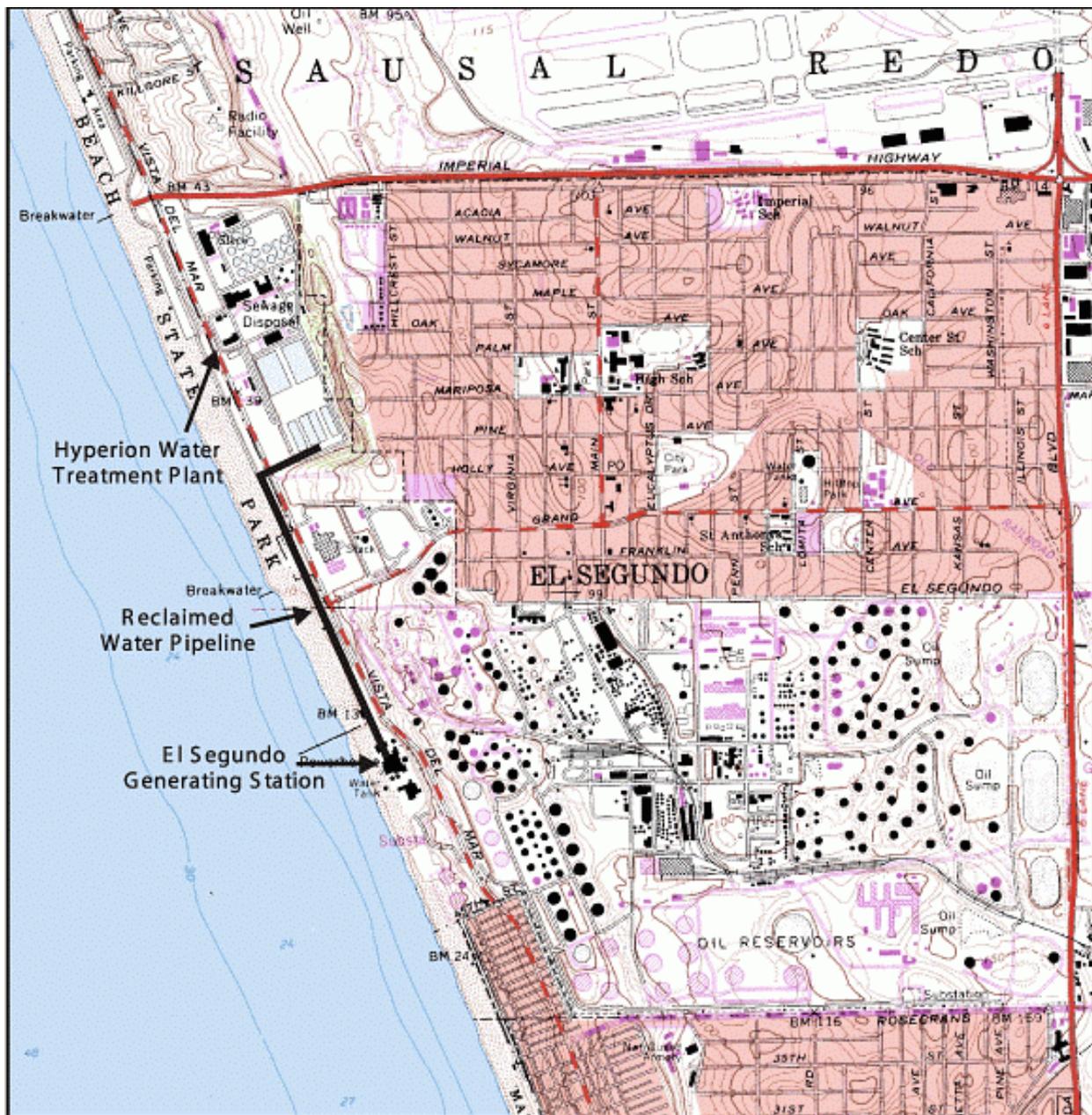
The actual flow requirements for the reclaimed water to be used in once-through cooling would have to be determined by ESPR, based on specific economic optimizations. In the analysis presented in this report, a conceptual design is presented based on an attempt to “bracket” the cooling requirements. This study’s engineering calculations conclude that the optimal flow would be between 50 and 150 MGD. The amount of heat that must be dissipated in this range of flow would be determined by the load of the steam turbine at ESPR. Use of 50 MGD would result in a higher power plant discharge temperature and use of 150 MGD would result in a lower discharge temperature. A more detailed examination of temperatures is presented below.

Physical Configuration

COOLING OPTIONS Figure 1 presents a map of a suggested pipeline route from Hyperion to the ESPR Project. Review of the existing structures beneath the roadway (Vista Del Mar) indicates that installing the pipelines in the road would be feasible. However, an alternative routing using the beach property may also be possible, at a reduction in cost, likely a faster construction schedule, and a reduction in traffic

impacts. Such a route would require passage through property owned by the Chevron Refinery and by the City of Los Angeles Scattergood Power Plant, and investigation of existing underground utilities on those properties would be needed.

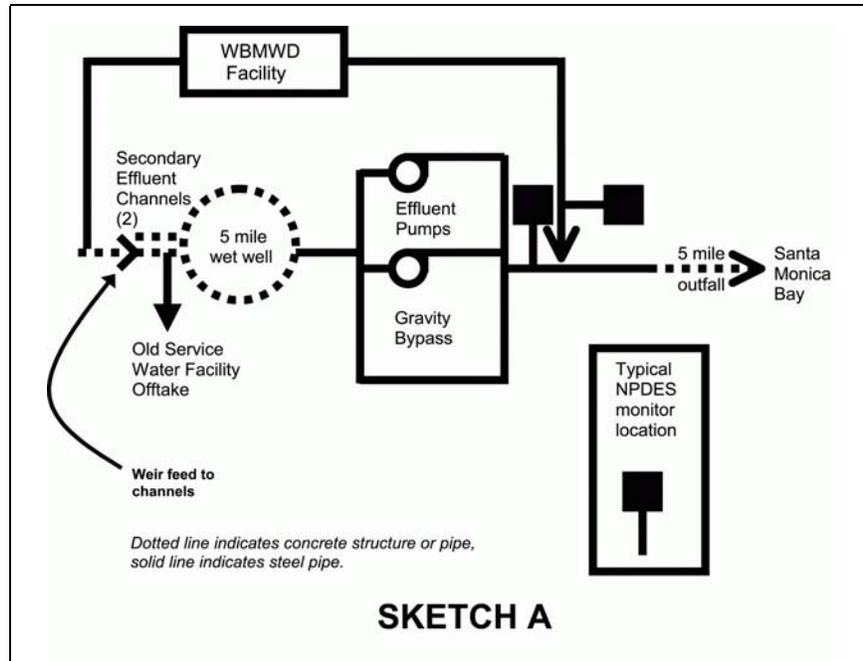
COOLING OPTIONS Figure 1.
Pipeline Route from Hyperion to ESPR Project



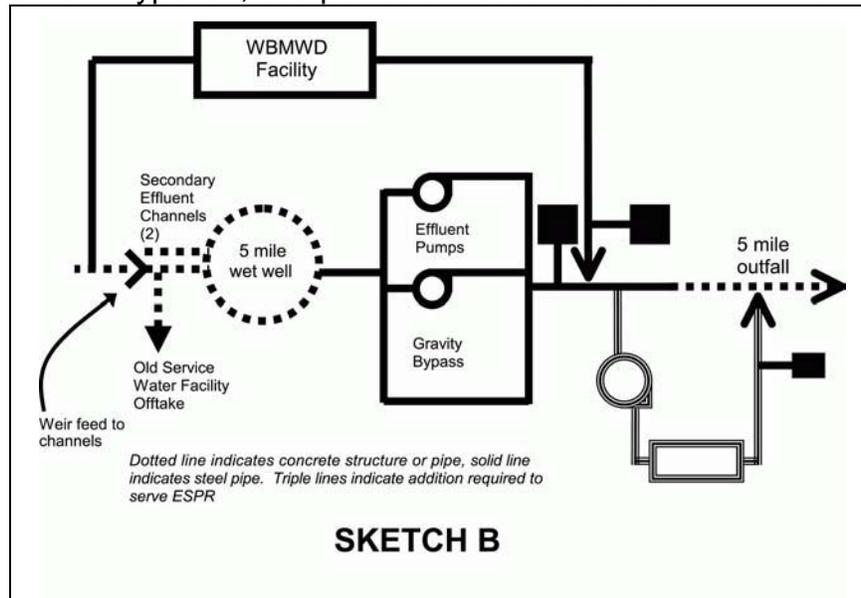
The diameter of the pipes required for this proposal would be determined after final selection of flow rates and pipe route. Pipe diameters could range from 6 to 10 feet. At this size, it is assumed that the pipes would be made of reinforced concrete, which is suitable for this service and low pressure. It is possible that final engineering could determine that other materials (i.e., fiberglass-reinforced plastic or steel) would be used.

In preparing this study, six configurations were considered for connecting the pipelines to Hyperion and providing water to the ESPR. All options considered the location of the potential offtake to ESPR and the location of the return from ESPR, except where the WBMWD and ESPR pipes were combined. The six configurations, defined in Sketches A through G below, are explained in the following paragraphs.

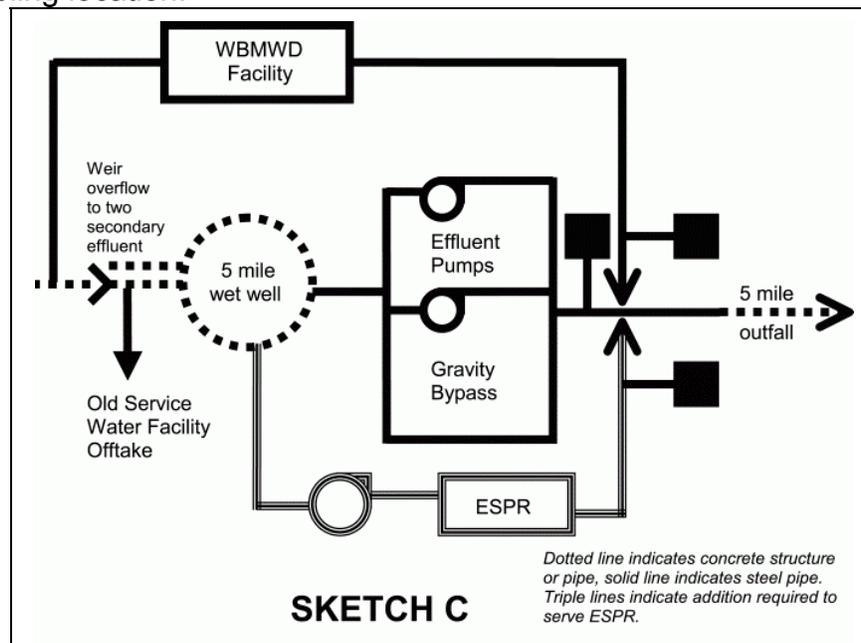
Sketch A is the configuration of the existing equipment, showing the location of Hyperion's NPDES sampling point as well as identifying concrete and steel structures. WBMWD suction is taken from a point ahead of the secondary effluent channel weirs, and returns brine flow to the five-mile concrete outfall pipe.



Sketch B presents the first option for connection of the ESPR to Hyperion. In this option, the connections for both supply and discharge were made at the concrete five-mile outfall line from Hyperion, at a point downstream of the WBMWD brine return.



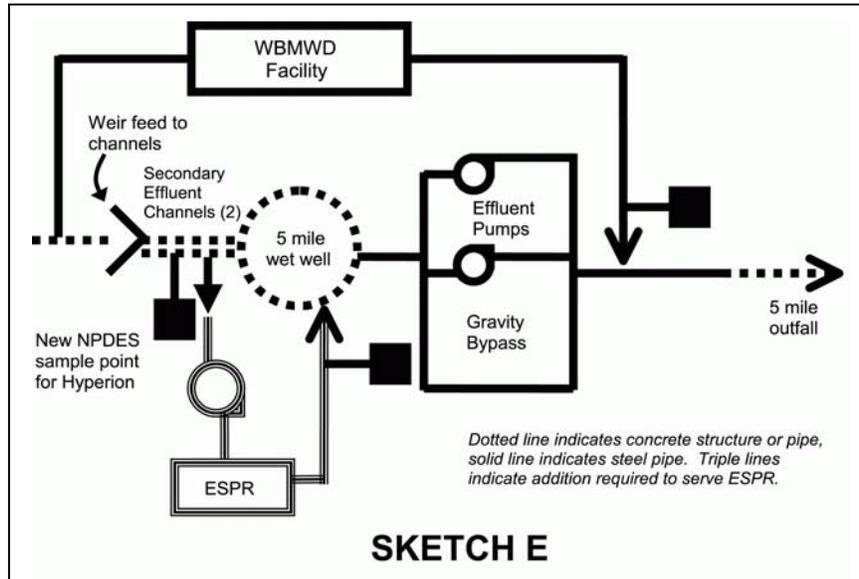
Sketch C illustrates the option of taking wastewater for ESPR pumps from the five-mile wet well, as do the pumps for Hyperion. This method would require no change to Hyperion's NPDES sampling location.



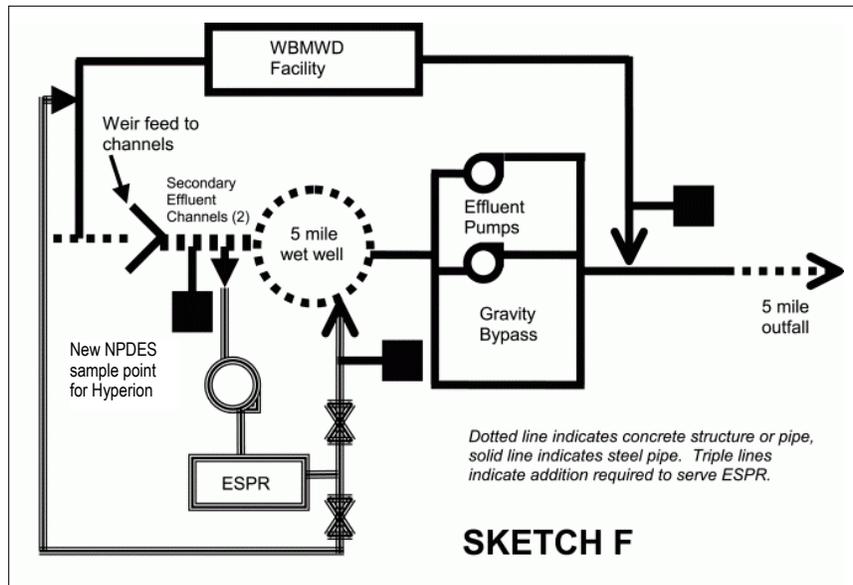
An Option D was considered in which ESPR would take its water at the Hyperion pump header and return the water to the Hyperion pump discharge. This option is not evaluated because it was determined to be infeasible (no sketch is provided).

Sketch E presents an arrangement where ESPR would take water from the steel connection that was used to take cooling water for the old (now removed) power plant at Hyperion.

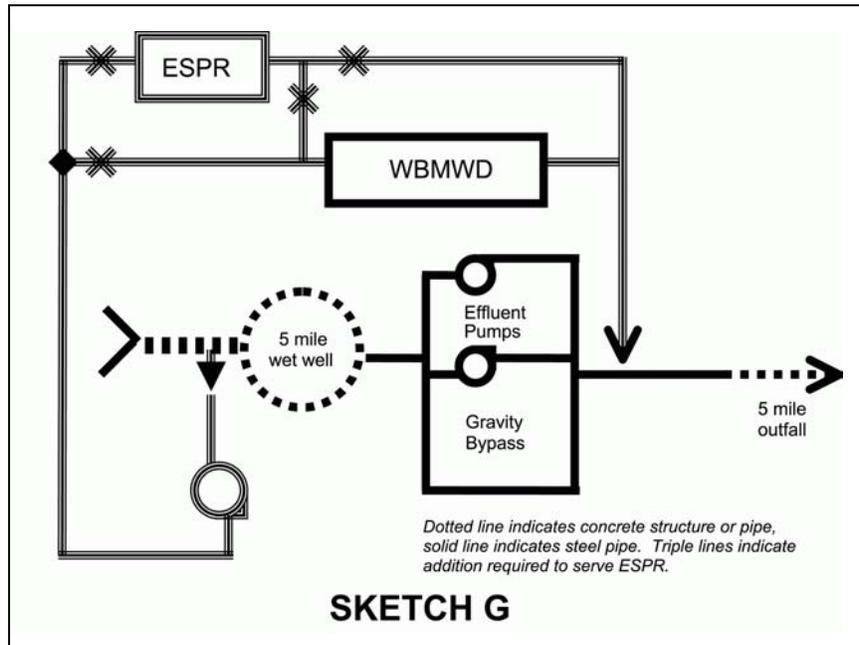
WBMWD is also considering the use of this connection to eliminate new penetration of concrete structures as it expands its operations.



Sketch F shows water for ESPR and WBMWD unchanged from Sketch E, but an addition is made so that the heated water returned from ESPR could be directed to WBMWD. The purpose of this arrangement would be to reduce the temperature of the five-mile outfall by returning a portion of the heated water from ESPR to WBMWD.



Sketch G is the option that currently appears most attractive to all parties. In this option, there is one connection for the combined offtake for WBMWD and ESPR, and one return for both facilities. This offtake would be located at the old power plant cooling water offtake. The return would be at the steel connection to the five-mile outfall pipe. The physical arrangement would imply the control of the entire system by a single entity, presumably the WBMWD. Thus the WBMWD would be the purveyor of water to ESPR and the manager of the water return in the interests of all parties.



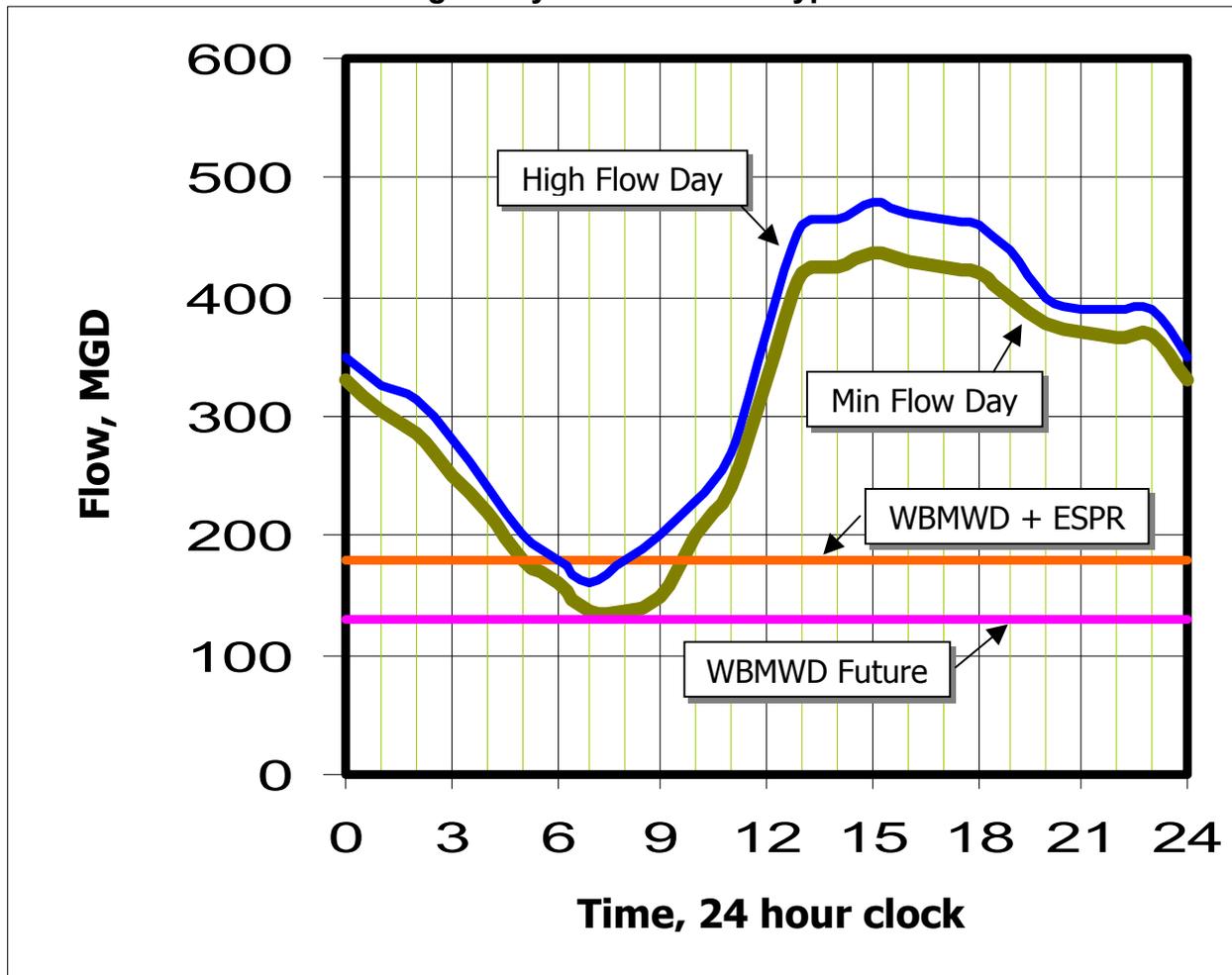
Cooling Water Flow Considerations

COOLING OPTIONS Figure 2 is a graphic representation of average flows into Hyperion. It presents a typical weekday flow (labeled “High Flow Day”) and average very-low-flow day (labeled “Min Flow Day”). These minimum flow days occur 3 to 5 times per year during major holidays. Under even extreme low flow days, the flow into Hyperion always exceeds 130 MGD.

Currently the WBMWD takes 28 MGD for tertiary treatment and resale to industrial customers. At this lowest flow, ESPR could readily operate with 100 MGD for cooling (this is the midpoint of the assumed range of 50 to 150 MGD for cooling at ESPR) and WBMWD could continue its current offtake.

In the future, WBMWD intends to increase its take from 28 MGD to as much as 130 MGD. If the ESPR and WBMWD uses were considered independently of each other, then there could in the future be short times at which insufficient flow is available for both uses. That is, the 130 MGD required for WBMWD plus the 150 MGD for ESPR would exceed the 130 MGD low-flow supply. However, since ESPR would not consume the treated water used for cooling, it could be returned and used by WBMWD after ESPR has used it for cooling.

COOLING OPTIONS Figure 2
Average Daily Flow Rates at Hyperion



WBMWD has expressed three concerns about using water that has been heated by ESPR:

1. The increased temperature may cause an increase in fouling of their treatment plant because slime and other growth may increase with temperature. WBMWD has no experience with which to quantify this effect, if it is found to exist.
2. Many of WBMWD's customers use the product water for cooling. Staff believes that a small increase in temperature would likely have little effect on evaporative cooling processes, but the actual impact on current or future customers has not been quantified.
3. Any chemical additions made by ESPR could have detrimental effects on the WBMWD plant, or on its customer's uses.

There are several ways that these potential problems could be managed. The first concern, temperature increases, would be determined by flow volumes. The flow requirements of WBMWD in the future may vary throughout each day. No actual sales of the future water have been made, so it is not possible to know the future flow rates at the critical times. However, while a majority of users are expected to be industrial

operations with 24-hour demand, it is likely that demand in the 5 AM to 9 AM time period (the time when Hyperion inflow is lowest) would be lower than during the remainder of the day. If this is true, there may be no conflict with future WBMWD sales.

Another way to address the temperature concern is by flow management. One scenario would supply both users independently during the majority of each day so that WBMWD would receive the same inlet temperature as Hyperion. For those few hours when there is insufficient flow volume for both users independently, the heated ESPR return water could be blended with Hyperion's treated water as input to WBMWD. Blending during the few early morning hours when the shortage might occur has been analyzed by staff. Because of the limited duration of the blending scenario, staff expects that problems would be minimal. Implementation of this course of action would require careful management of flows out of Hyperion, which would be easier if a single agency (e.g., WBMWD) managed all flows for optimum results.

The most direct way to reduce temperature in event of a conflict between WBMWD's future needs and ESPR's needs would be to reduce load on the steam turbine at ESPR during the short critical periods of low flow. The low flow time at Hyperion coincides generally with the time of lowest electric demand and low electrical market prices.

It may also be possible to allow the use of ocean water cooling at ESPR for a few hours on the infrequent days when load could not be reduced. The environmental consequences of this short-term use of seawater would be difficult to determine, and the potential impacts of this option are not evaluated in this study.

Staff believes the second concern would not be limiting. The third concern could be managed by ESPR's agreement not to add chemicals to the process unless fully approved by both WBMWD and Hyperion, and in full compliance with the NPDES Permit. This may require that condenser tube cleaning be accomplished more frequently by mechanical rather than chemical means.

In summary, staff believes that the minimum recorded flow into Hyperion would be adequate to supply the demand at both ESPR and WBMWD. As described above, there are several methods available to prevent or manage a possible future conflict in flow demand between WBMWD's future sales and ESPR's cooling needs.

Discharge Temperature Effects

The temperature of current input to and discharge from Hyperion varies between 68 °F in the winter and 85 °F during the summer (May-September). While future WBMWD demand may require that it accept return flow from ESPR as discussed above, this analysis assumes that the reclaimed water used at ESPR for cooling would result in heated water being returned to Hyperion for discharge. The NPDES Permit for Hyperion limits the discharge temperature to 100 °F. To evaluate the potential variation in discharge temperatures, it is necessary to consider the variables of steam turbine load, Hyperion inlet temperature, Hyperion inlet flow, and WBMWD offtake volume. Following are several scenarios:

- If the Hyperion inlet temperature is 75 °F or less, the 100 °F NPDES discharge limit could be met with any Hyperion flow over 154 MGD, even with full "peaking" load on

ESPR. With 130 MGD this drops to a value between combined cycle load and peaking load.

- If the Hyperion inlet temperature is 85 °F, the 100 °F limit could be met with 257 MGD flow and full peaking load, or 195 MGD and combined cycle load.
- If the Hyperion inlet temperature is 85 °F, the 100 °F limit could be met with 150 MGD (available all but approximately 5 hours per year) and approximately half load on the steam turbine at ESPR.

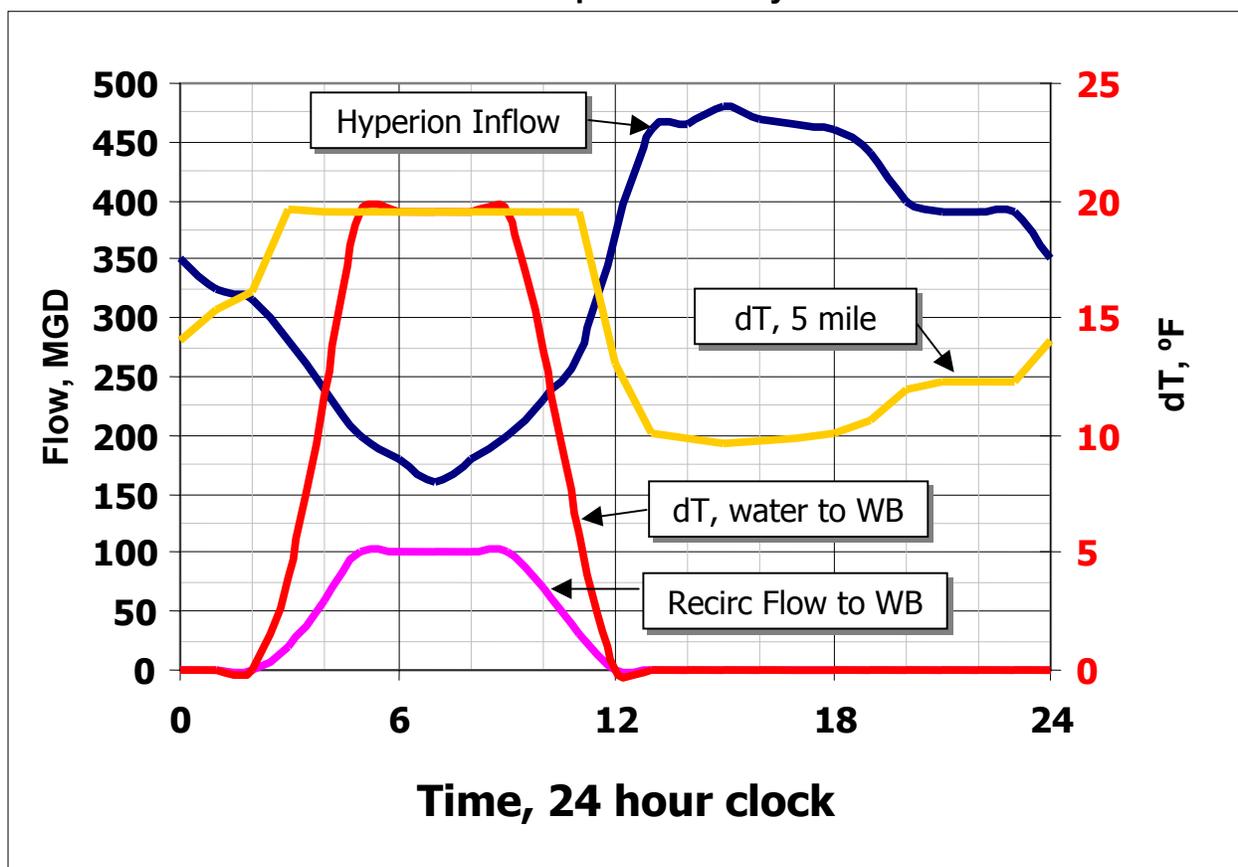
This study considers, as an extreme, the times at which the lowest Hyperion flow conditions could coincide with maximum ESPR loads and WBMWD offtake. **COOLING OPTIONS** **Figure 3** shows this condition for a full day, assuming peak load at ESPR, a 100 MGD rate for WBMWD during the low flow hours, and 130 MGD at other times. The scenario is that the two users of water are independent until Hyperion inlet flow volume is reduced. At about 2 AM, some ESPR heated water would have to be blended to WBMWD input, increasing to 5 AM, and reducing from 9 AM to Noon. As can be seen in Figure 3, under these extreme conditions, the Hyperion temperature to the five-mile outfall would be raised by 19.5°F from 3 AM to 11 AM. While this would allow compliance with the 100°F limit when the inlet temperature is 80°F, at an 85°F Hyperion inlet temperature the five-mile discharge temperature would be 105°F. The purpose of the graph is not to propose an operation for an 85°F day, but rather to illustrate the interaction of variables and show a practical management strategy for the majority of the typical year.

Discussion with personnel at Hyperion and with the City of Los Angeles indicates that the NPDES temperature limit may be flexible if it can be shown that no damage would be done to the marine environment. As a participant in this study, the City of Los Angeles wrote to Mr. James Reede, Project Manager for this study and the AFC, on July 26, 2002. Under the heading of “Technical Issues,” the City provided the following statement:

“The issue of the temperature increase in the ESGS cooling water returned to the HTP Five-Mile Outfall is an issue with the plant’s NPDES Operating Permit. Research has shown that the 100°F limit in the HTP effluent is based on the Los Angeles Regional Water Quality Control Board’s Basin Plan. The Basin Plan calls for compliance with the California Ocean Plan, which in turn calls for compliance with the California Thermal Plan. The Thermal Plan only calls for preventing damage to the ecosystem. The 100°F limit is common to several ocean-discharging treatment plants, so City Staff is of the opinion that the 100°F limit is based on oceanographic research done in the 1970–1980’s, as it does not appear to be written into any of the appropriate regulatory plans that the State has issued on this matter.”

This is indicative that it might be possible to raise the discharge temperature limit to some extent. However, any flexibility in the NPDES requirements would need to be verified by the Los Angeles Regional Water Quality Control Board, which has been historically opposed to relaxing any treatment standard.

**COOLING OPTIONS Figure 3
Flow and Temperature Daily Profile**



There have also been concerns expressed about the ability of Hyperion's five-mile outfall to handle the increased thermal load with the hotter effluent. A study would be necessary to determine if the pipe joints of the bell and spigot construction can thermally expand without breaking the joint seals.

Without identifying an actual design that would be used, it is possible to conclude that there are several methods available to control the discharge temperatures from ESPR.

Cost

After the conceptual design for this cooling system was prepared, staff made estimates of the approximate cost of accomplishing the plan. The Chief Cost Estimator of the Pipeline Division of the California Department of Water Resources, the General Manager of the San Bernardino Valley Municipal Water District and the Senior Civil Engineer at the Sacramento Regional Wastewater Treatment Plant were helpful in providing a range of cost data for the large-diameter pipelines and the related construction. The WBMWD shared its cost information from construction of pump stations at Hyperion, and the City of El Segundo was helpful in providing drawings of underground structures in Vista Del Mar Street. Staff has concluded that preparing connections at Hyperion, installing pumps if necessary, piping from Hyperion to ESPR, and making connections to ESPR would require capital expenditures of less than \$12 million. Use of the existing cooling water pumps at ESPR would reduce this figure by at least 25 percent. This estimated cost would be less than 2.5 percent of the plant cost, which is considered to be a reasonable project capital cost.

It has been observed that there are several agencies that advertise support of reclaimed water projects. Support could include financial assistance — low-interest-rate loans and/or grants. A brief review of public information indicates that supporting agencies include the Water Reuse Association, California Department of Water Resources Reclamation Board, CALFED, California State Water Resources Control Board, and the U.S. Bureau of Reclamation. ESPR and/or WBMWD could seek the participation of any agencies, including those listed, that have a goal of promoting the use of reclaimed water and the resources to aid such promotion. If successful, such participation would be an economic benefit to ESPR for the reclaimed water cooling option. The specific benefit of this strategy is not analyzed in this study.

No estimate has been made for additional operating costs that would result from this cooling system. It is expected that the purchase of secondary effluent water itself would be a continuing cost. It is also possible that the City of Los Angeles would want a “conveyance” charge for use of its five-mile discharge line. While these costs have not been determined, it is clear that maximizing the use of reclaimed water is a stated goal of the City of Los Angeles, WBMWD, the State of California, the Los Angeles RWQCB, and the California Department of Health Services. Relating to this project specifically the Los Angeles Department of Public Works wrote in a letter of June 25, 2002, signed by Judith A. Wilson, Director of the Bureau of Sanitation:

"The Bureau is supportive of reclaimed water projects and water reuse in general and appreciates the critical need to have adequate generation capacity to meet California's energy demands We offer to work with you, the Department of Water and Power and the WBMWD to evaluate and analyze all the options."

Offtake Options

Current agreements now require that offtake of secondary treated effluent from Hyperion occur only by transfer to the City of Los Angeles Department of Water and Power, which in turn sells the water to WBMWD for resale to retail consumers. There is no procedural mechanism for the sale of water to ESPR. Staff assumes that WBMWD would be the purveyor of water in this case. However, it is not clear whether ESPR or WBMWD would build the proposed system. As for negotiations related to cost, it seems clear that an effective method of accomplishing the proposed plan could be developed, given that the parties involved are in support of the proposed water use plan.

Health Requirements

The secondary treated water from Hyperion would normally discharged to the ocean, where natural conditions disinfect any potential disease-causing agents. However, if wastewater were used for cooling as proposed herein, the health effects of this use must be considered. Sections 3.5, 3.8, and 3.13 of this report address potential impacts in the areas of hazardous materials management, public health, and worker safety, respectively.

The California Department of Health Services (DHS) is responsible for regulation of treated wastewater. The primary regulation of concern is California Code of Regulations, Title 22, Division 4, Chapter 3, sections 60306 and other related sections. There is clear allowance for using secondary treated water for industrial cooling if it

meets the requirements of “Disinfected Secondary 23” (Section 60301.225, Disinfected Secondary-23 Recycled Water). Hyperion secondary treated water could meet this requirement if adequately chlorinated. However, de-chlorination would be required before release to the ocean, and this could be costly.

An option to chlorination was suggested by Mr. Jeffrey Stone at DHS. It is possible that, based on a complete safety study of the proposed system, disinfection might not be required. This allowance may be permitted because the system would be closed, would not have faucets attached, and would not traverse areas where members of the public could be exposed to drinking the water. An educational program for workers in the power plant would be required to assure that they were protected from disease agents that could exist in the secondary effluent. This situation would parallel that of the WBMWD employees and Hyperion plant staff who deal with the Hyperion secondary effluent prior to and during its treatment to tertiary standards; thus there is a precedent for this type of allowance.

CONCLUSION FOR CONCEPTUAL DESIGN

This study has found that there are multiple engineering studies which will be needed, optimizations to be completed, and numerous technical “problems” to resolve. The applicant will need to approach these with its own set of skills and its own set of optimizing factors, and the resulting solutions may vary from those identified in this study. However, none of the problems identified here would appear to make the proposed cooling method impractical.

ENVIRONMENTAL AND ENGINEERING ANALYSIS OF ONCE-THROUGH COOLING USING RECLAIMED WATER

The following subsections describe the environmental and engineering impacts of once-through cooling using reclaimed water. The analysis includes an evaluation of the use secondary treated water with discharge via Hyperion’s existing outfall. The areas relating to Transmission Line Safety and Nuisance, Facility Design, and Geology and Paleontology were deemed to have no impacts and are not included in further analysis.

AIR QUALITY

General Impacts of Using Reclaimed Water

Once-through cooling systems are closed systems and therefore do not emit air pollution. As a result, the only air emissions from the once-through use of secondary treated reclaimed water from Hyperion would be from the construction of the required water pipelines. The applicant would be required to comply with the Energy Commission construction conditions to minimize construction related air emissions.

Secondary Treated Water Discharged at Hyperion

ESPR’s proposed project would include construction of 1.9 miles of reclaimed and potable water pipelines, 200 feet of sanitary discharge line, and 0.5 mile of aqueous ammonia supply line. The construction emissions from these pipelines would be similar to the emissions expected from the proposed treated water line from Hyperion. The

maximum pipeline construction emissions are presented in **EL SEGUNDO COOLING OPTIONS Table 1**.

**EL SEGUNDO COOLING OPTIONS Table 1
Estimated Emissions for Pipeline Construction**

Pollutant	Maximum Daily Emission (lbs/day)
NOx	117.82
VOC	8.91
CO	41.45
Sox	4.06
PM10	7.03
Fugitive PM10	8.53

The air emissions that have the potential to cause a significant impact on the ambient air quality are the PM10 emissions. The impact assessment was performed with the understanding that the location of the maximum impact is unknown since the construction activity moves along the linear. Based on the modeling of construction activities at the project site, the estimated impact from the secondary water pipelines is 73.1 $\mu\text{g}/\text{m}^3$ of PM10. Adding this to the background measurement of 69 $\mu\text{g}/\text{m}^3$ gives a total impact of 142.1 $\mu\text{g}/\text{m}^3$ or approximately 284 percent of 24-hour PM10 California Ambient Air Quality Standard, and very near the PM10 National Ambient Air Quality Standard of 150 $\mu\text{g}/\text{m}^3$. If left unmitigated, staff would consider this a significant impact.

Conclusion for Air Quality

The use of secondary treated reclaimed water in the once-through cooling system would produce potentially significant impacts resulting from pipeline construction. Mitigation to less than significant levels using the measures similar to those proposed for construction of the proposed project in the **Air Quality** section of this FSA may be possible, but would require evaluation of specific information regarding construction equipment, scheduling, and dust control measures.

TERRESTRIAL BIOLOGICAL RESOURCES

General Impacts of Using Reclaimed Water

The use of once-through cooling with reclaimed water is evaluated to determine its effects on terrestrial biological resources. The proposed project site and ancillary facilities are located in a highly industrialized area, with the exception of the adjacent marine environment of Santa Monica Bay.

Historically, terrestrial habitat at and adjacent to the ESPR project site may have included sand beach, southern dune scrub, coastal salt marsh and coastal sand dune habitat adjacent to the Bay. Today, only small, isolated patches of natural vegetation and associated wildlife remain as a result of heavy industrial development of the area, including a few small areas of ornamental plantings (such as palm trees) immediately to the east of the existing ESGS boundary and isolated patches of ruderal vegetation such as grasses, thistles and other weedy species. Consequently, few wildlife species are

supported on the site or adjacent, vegetated habitats. Urban birds are most common and include pigeons, mourning doves, starlings, and house sparrows. None of these birds are considered protected species or are listed by the California Department of Fish and Game or the U.S. Fish and Wildlife Service.

In the Final Staff Assessment, **Biological Resources Table 1** provides a list of sensitive species that may be found in the terrestrial environment of the Project area; however it is unlikely that any of these species would persist within the project site or adjacent areas given the highly disturbed and fragmented nature of the habitat. Exceptions to this are two sensitive habitat areas located at the Chevron Preserve approximately 0.3 miles northeast of the Power Plant site, and the El Segundo Dunes Preserve located approximately 1.5 miles north-northwest of the site. Both areas provide habitat to the El Segundo blue butterfly (*Euphilotes battoides allyni*), a federally listed endangered species. In the Final Staff Assessment, staff concluded that there would be no significant impacts to terrestrial biological resources, including federal or state endangered or threatened species.

Secondary Treated Water Discharged at Hyperion

In this scenario, ESGS would use secondary treated water for cooling, and then return the warmed water to Hyperion for disposal through its existing discharge pipe. Hyperion currently discharges secondary treated water through its five-mile discharge pipe to the ocean. This option would require construction of a second pipeline from Hyperion to the ESPR project (one pipeline would transport water in each direction). It would ostensibly disturb more land for construction than the option for use of tertiary treated water. However, given that there are no significant biological resources located along this alignment and since the pipeline construction routes would not disturb habitat for the federally endangered El Segundo blue butterfly, there would be no significant impacts to terrestrial biological resources as a result of the construction of a second water line and using secondary treated water for power plant cooling.

Conclusion for Terrestrial Biological Resources

The use of reclaimed water in a once-through cooling system at the ESPR project would not result in any significant impacts to terrestrial biological resources or sensitive species. Overall, the nature and magnitude of the impacts of using reclaimed water would be similar to terrestrial impacts resulting from the proposed project. Because of this, decisions regarding the biological impacts of various water sources for once-through cooling can and should be based entirely on impacts to aquatic, rather than terrestrial biological resources.

MARINE BIOLOGICAL RESOURCES

General Impacts of Using Reclaimed Water

The use of reclaimed water rather than seawater to cool the new Units 5, 6, and 7 of the El Segundo Power Redevelopment Project would eliminate the entrainment of planktonic organisms in the cooling water system and the impingement of fishes and macroinvertebrates on the intake screens. Marine resources could still be affected by the discharge of heated water to the ocean.

Secondary Treated Water Discharged at Hyperion

Under this option, secondary treated water from Hyperion would be used to cool ESGS Units 5, 6, and 7. The warmed water would be returned to Hyperion for discharge via its five-mile outfall. As described in the **Soil and Water Resources** section below, the discharge of the cooling water through the Hyperion outfall would result in a temperature rise above the existing discharge temperature at the discharge point. As discussed in the Water and Soil Resources section of this document, the average temperature rise would be about 7 degrees, but under worst case conditions could be as much as 19.5 degrees. The Hyperion discharge is through diffusers that promote rapid mixing. Ambient ocean temperature at the depth of the Hyperion discharge is generally between 50 and 60 degrees Fahrenheit. Therefore, the temperature of the discharge plume would be expected to cool rapidly beyond the diffuser nozzles. The warmer discharge would increase the buoyancy of the Hyperion wastewater plume.

This option is expected to have minimal effect on marine resources. The discharge of heated water from the Hyperion outfall might cause some temperature-sensitive fish species to avoid the immediate vicinity of the discharge. Under worst case conditions when the Hyperion discharge temperature is at 80 degrees or higher and when the temperature elevation from ESPR cooling water is at 19 degrees or above, temperatures at the point of discharge may be lethal to some organisms. Plankton organisms carried into the discharge plume in the immediate vicinity of the diffusers may be killed by the heated water. However, the plume would mix rapidly with the cool ambient seawater and exposure to high temperatures would only occur in the immediate vicinity of the diffusers. The addition of ESPR cooling water to the Hyperion outfall would not be expected to increase significantly the impacts of the Hyperion discharge over the existing condition.

Conclusion for Marine Biological Resources

The use of ocean water to cool Units 5, 6, and 7 would result in the loss of billions of fish eggs, larvae and planktonic algae and invertebrates every year through entrainment in the cooling water system. In addition, adult fishes and macroinvertebrates would swim through the intake pipe and become trapped in the forebay. The trapped animals eventually would be killed during heat treatments. Some marine organisms would also be adversely impacted by the project's thermal discharge.

Adverse entrainment, impingement and thermal impacts have the potential to be significant on both a direct and a cumulative basis. Recent entrainment studies done at several California coastal power plants (Moss Landing, Morro Bay, Diablo Canyon, and San Onofre) have found significant *direct* impacts to local marine resources. Furthermore, many southern California nearshore fish species have been in decline since the 1970's (Herbinson et al. 2001; Love, Caselle, and Van Buskirk 1998). Thus, *cumulative* adverse entrainment, impingement and thermal impacts of power plants using once-through cooling systems add to the losses of coastal resources already stressed by a multiplicity of factors including ocean warming, overfishing, and pollution.

The use of treated water to cool the new ESGS Units 5, 6, and 7 would eliminate entrainment and impingement losses at the existing Unit 1 and 2 intake. Once-through cooling will continue at Units 3 and 4. Therefore, marine organisms will continue to be lost to

impingement and entrainment at the Unit 3 and 4 intake. However, when the ESPR project comes on line, Units 5, 6, and 7 will become the base units and the volume of water circulated through Units 3 and 4 would be expected to drop compared to the existing condition. Thus, the use of reclaimed water to cool Units 5, 6, and 7 would significantly reduce impingement and entrainment at the ESGS intakes compared to the existing condition.

If secondary treated water from Hyperion were used to cool Units 5, 6, and 7 and then discharged through the existing Hyperion outfall five miles offshore, minimal impacts to marine resources would be expected. The use of treated water would eliminate the impacts of impingement and entrainment from Units 5, 6, and 7. The discharge of water with a temperature rise of 19.5 degrees over the existing discharge under the worst case conditions at this location would not be expected to add significantly to the existing impacts of the Hyperion discharge.

CULTURAL RESOURCES

Cultural Resources Impacts of Using Reclaimed Water

The use of reclaimed water for cooling at ESGS would require construction of two pipelines that would extend approximately one mile from Hyperion south to the El Segundo project site. Installation of two pipelines, six to ten feet in diameter would require a trench width of 35 to 40 feet. As the pipeline leaves Hyperion, it would be bored under Vista del Mar and continue south to the El Segundo project site, or it could be installed within the roadway of Vista del Mar.

No previously recorded built environment resources were identified during the records search for the original El Segundo project. However, several archaeological sites in the vicinity of the originally proposed project were identified. A cultural resource survey was conducted only in the parking lot areas along the proposed pipeline route during the original studies for the El Segundo project. No additional built environment or archaeological resources were identified as a result of the survey of the parking lots adjacent to the proposed waterline route.

In order to determine whether there will be any impacts to archaeological resources, a cultural resources survey along the proposed pipeline would be necessary. In addition, due to the presence of nearby sites, staff would recommend presence/absence testing for cultural resources in the area where boring is anticipated. Staff would also recommend full time cultural resources monitoring along the entire pipeline route until the end of pipeline ground disturbance.

If an archaeological site or human remains of Native American origin were identified during a survey or presence absence testing, avoidance would be the first mitigation considered. If a site could not be avoided, an evaluation would be necessary to determine significance. If the site were recommended eligible to the California Register of Historic Resources or National Register of Historic Places, data recovery would be necessary.

If avoidance was not possible for a large site or discovery of human burials, the data recovery for the site or reburial of the human remains could be very expensive. An

additional difficulty could arise if Native American groups did not want the human remains reburied. Some Native American groups object to moving human remains to another location for reburial.

Conclusion for Cultural Resources

The use of secondary treated water would require pipeline construction. Because archaeological sites are present in the vicinity, cultural resource surveys would need to be conducted and cultural resource monitoring is recommended.

HAZARDOUS MATERIALS MANAGEMENT

General Impacts of Using Reclaimed Water

The municipal effluent from Hyperion would need to be processed and pretreated before it can be used for a cooling medium in the ESPR project. Manufacturers of cooling equipment typically specify that the cooling medium to be used meet certain criteria in order to be acceptable for use with their equipment. This is necessary to alleviate the general water quality problems of scaling, corrosion, biological growth, and fouling. The pretreatment involves conditioning and the type, level, frequency, and intensity of the pretreatment would depend on three factors, as a minimum. The quality of the Hyperion effluent would be one factor. The ability of the Hyperion plant to consistently maintain the quality of the effluent without violating regulatory discharge standards is another factor. The third would be the technical specifications for the cooling medium as required by the cooling equipment manufacturers.

Regulatory standards specified for the discharge of the cooling water after its once-through cooling use would also determine the need for additional end-of-the pipe treatment and the type and level of such treatment.

Consequently, use of some of the hazardous chemicals intended for seawater pretreatment cooling and end-of-pipe treatment prior to discharge may be minimized or eliminated, or increased for reclaimed water cooling purposes. There may be a need to use other additional chemicals. The ESPR project's design engineer would need to specify the type and amount of each chemical that would be required under the reclaimed water cooling scenario.

Secondary Treated Water Discharged at Hyperion

The discharge from Hyperion is currently treated to a secondary standard. A near-neutral pH, low suspended solids, low salinity levels and moderate organic content, would typically characterize this effluent. Because the quality of water intended for cooling purposes is important, the secondary effluent may need to be chemically pretreated prior to use as a cooling medium and possibly again prior to its proposed discharge from Hyperion. However, assuming compliance with relevant regulations and development of appropriate conditions of certification, impacts from use of secondary treated water can be reduced to less than significant levels.

Conclusion for Hazardous Materials Management

The use of a reclaimed water cooling process may require the storage and use of hazardous chemicals. The quality of the Hyperion effluent, cooling medium specification

requirements, proposed secondary treatment and applicable waste discharge standards would all influence the types of chemicals needed and their quantities for reclaimed water cooling.

It has been established that hazardous chemical usage in seawater cooling, as it stands right now, does not pose any significant impacts on public health. Any risks associated with chemical usage in reclaimed water cooling should be adequately mitigated through compliance with the appropriate federal, state, and local requirements for hazardous materials use and adherence to existing or modified conditions of certification or additional conditions of certification. The modified or additional conditions are contingent upon the type of chemicals used for reclaimed water-cooling.

LAND USE

Introduction

The evaluation of cooling technologies for the ESPR project under the land use technical area focused on two issues: (1) consistency with applicable land use plans, ordinances, and policies; and, (2) compatibility with existing and planned land uses.

Laws, Ordinances, Regulations, and Standards (LORS)

The applicable State laws for the implementation of an alternative cooling system would include the California Coastal Act (Public Res. Code §30000 et seq.) and State Tideland and Submerged Land Leasing requirements (Public Res. Code §§6216 and 6301). For a discussion of these state laws and regulations see the **LAND USE** section of this FSA.

Applicable local ordinances, regulations and plans for the implementation of either cooling option would include the City of El Segundo General Plan and the City of El Segundo Local Coastal Program (LCP). For further discussion of these local LORS see the **LAND USE** section of this FSA.

Land Use Impacts of Using Reclaimed Water

The use of reclaimed water to provide cooling for the ESPR project's new Units 5, 6, and 7 eliminates use of seawater for cooling purposes. Since the new generating units to operate at the ESGS would be obtaining cooling water from a source other than the sea in order to function, the coastal dependent use definition under the California Coastal Act may not apply to the ESPR project but would continue to apply to the ESGS power plant facility site.

The principal land use change and corresponding impact of this cooling alternative would result from the construction of reclaimed water pipeline(s) between the ESGS and the Hyperion sewage treatment facility, to provide cooling water for the ESPR project. The use of treated water discharged at the Hyperion facility would require the construction of two pipelines, one for water delivery to the ESGS and a second for water return to Hyperion. The proposed pipeline(s) will be located in both the City of El Segundo and the City of Los Angeles. A common trench for both pipelines will be 14 to 16 feet wide. Construction, including directional drilling under Vista Del Mar, should be able to be completed outside of the summer peak season. The second possible pipeline route

between the ESGS and Hyperion facility would be installed under Vista Del Mar, within the road right-of-way.

The pipeline connections to the ESGS and Hyperion facility would be either directionally drilled to the west of Vista Del Mar or installed in the road's public right-of-way. Two pipeline routes have been proposed. Under the first option, the pipeline(s) would be buried in a trench on the seaward side (west) of and immediately adjacent to Vista Del Mar that fronts along Dockweiler State Beach. The trench would pass through public parking lots owned and maintained by the County of Los Angeles (Los Angeles County Department of Beaches and Harbors) that are located along the State owned beach. Construction activity would temporarily limit parking access to some beach areas.

No beach sand would be removed from the pipeline construction area. The construction site would be restored to its original condition upon completion of pipeline construction activity.

Based on communication with the staff of the California Coastal Commission, the soil structure along this area of beach is considered to be reasonably stable. It contains fill that currently supports structures such as pipelines and roadway. Shoreline erosion that could expose and endanger the pipeline(s) is not considered to be a significant threat. The proposed installation of the pipelines appears to be consistent with California Coastal Act policies (Luster, 2002).

In order to construct the required pipelines, only right-of-way encroachment permits will be required from the cities of El Segundo and Los Angeles (Garry, 2002).

Consistency with Plans, Ordinances, and Policies

The 33-acre ESGS property is within the designated Coastal Zone. The land use designation for the project site as shown in the City of El Segundo Local Coastal Program is "Power Plant". The City of El Segundo's General Plan designates the site as "Heavy Industrial." The Heavy Industrial designation allows generating stations. The City's LCP supercedes the City's General Plan designation and policies on this site.

The property is zoned "Heavy Industrial" (M-2) by the City. Under the City's Title 15: Zoning Regulations, Chapter 6, the M-2 Zone allows generating stations as a permitted use.

The key land use issue for the alternative cooling options is whether the project would be consistent with the certified City LCP if the project were modified to use reclaimed water in its cooling system. In accordance with the City of El Segundo Local Coastal Program and the City of El Segundo's Council Resolution No. 3005, the primary industrial land uses allowed in the Coastal Zone are coastal dependent uses as defined by the Coastal Act. Coastal Act section 30101 defines a coastal dependent development or use as "...any development or use which requires a site on, or adjacent to, the sea to be able to function at all."

The existing ESGS power plant facility was determined to be consistent with the City LCP by the City because it was found to be a coastal dependent use. The Coastal

Commission concluded that the ESGS was a coastal dependent use consistent with the LCP and that the LCP was in conformance with the Coastal Commission's Regulations (Chapter 6, Article 2, Coastal Act) in order to certify it in February 1982. The ESGS facility remains a coastal dependent use under the certified LCP until such time as the Coastal Commission determines that the use is not coastal dependent by appropriate action.

A certified LCP and all local implementing ordinances, regulations, and other actions may be amended by the appropriate local government, but no such amendment becomes effective until it has been certified by the Coastal Commission (Public Res. Code, section 30514 (a)).

In addition, staff believes that because the ESGS facility will continue to use seawater to cool Units 3 and 4, the ESGS facility would continue to be characterized as a coastal dependent use. The ESPR project is a component of the ESGS facility.

The Coastal Commission is required to submit a consistency/suitability report on the ESPR project to the Energy Commission in accordance with section 30143(d) of the Coastal Act. The report is to provide among other items, a determination of the conformance of the proposed site and related facilities with the certified local coastal program of the effected jurisdiction. The California Coastal Act includes several provisions that relate to coastal dependent development and particularly to the location or expansion of power plants in the Coastal Zone. Coastal Act §30260 encourages the expansion and reasonable long-term growth of coastal dependent industry at existing sites.

The alternative cooling system being considered in this analysis is evaluated as a possible mitigation for the significant adverse impacts to coastal resources caused by the once-through cooling system. Use of reclaimed water with once-through cooling would reduce or eliminate the significant use of seawater and may allow the project to be consistent with the Coastal Act's requirements for the protection of coastal resources.

Staff recognizes that the Coastal Commission has the responsibility for interpreting these provisions in its consistency/suitability report that is required to be submitted to the Energy Commission on the project. If the Coastal Commission determines that the project using an alternative cooling system in place of seawater cooling is not coastal dependent industry, the ESPR project would be inconsistent with the site's land use designation under the El Segundo LCP. This inconsistency would be a significant land use effect unless the City amended its certified LCP.

Modification of the facility's existing seawater intake structure would be subject to consistency with the California Coastal Act and the California State Lands Commission executed lease. Both existing intake structures serving the ESGS are located on state tideland and submerged lands owned and administered by the State of California. The State Lands Commission is the administering agency for State owned lands. The applicant has an executed lease with the State of California. The executed lease (No. 858.1 Public Resources Code Series, Ser. 18736A) is scheduled to expire on October 27, 2002.

Conclusion for Land Use

The proposed use of a reclaimed water cooling system for the project may affect whether the project is consistent with the “coastal dependent” definition of the California Coastal Act and the City’s LCP “Power Plant” designation on the 33-acre ESGS power plant facility site. Use of this type of cooling system could be viewed as an elimination of the “coastal dependent use” for the ESPR project portion of the facility site but not the entire ESGS facility. The ESGS facility has been determined to be a coastal dependent use by the certified City LCP.

Staff also believes that because the ESGS facility will continue to use seawater for cooling Units 3 and 4, the facility maintains a coastal dependent use in accordance to the Coastal Act and would still be consistent with the site’s land use designation under the LCP.

Although the project could be considered inconsistent with the Coastal Act and the City’s LCP, staff believes that adoption of the use of reclaimed water in place of seawater, as mitigation for significant adverse impacts to coastal resources should not prevent approval of an otherwise allowable expansion of an existing coastal dependent power plant. The suggested modification to the proposed ESPR project to use reclaimed water is to specifically mitigate significant adverse effects on aquatic biological resources.

The Coastal Commission has the responsibility for interpreting relevant provisions of the Coastal Act and the El Segundo Local Coastal Program in its consistency/suitability report to the Energy Commission required under the Coastal Act (Section 30413(d)). If the Coastal Commission determined that the ESPR project using a closed cooling system with reclaimed water is not a coastal dependent use in accordance to the City’s LCP, a significant land use impact (inconsistency) would occur if the City elected not to amend the LCP. The applicant has the option of filing a request to amend the City’s LCP with either the City of El Segundo or the California Coastal Commission for their consideration. The Coastal Commission’s certification is required for any amendment to the City’s LCP in order for it to become legally in effect.

The actual installation of an underground pipeline(s) that would transport reclaimed water from the Hyperion sewage treatment facility to the ESGS would not result in significant adverse land use impacts provided construction can be staged to affect the least possible amount of land, not impede the public’s access to the beach and scheduled to avoid peak beach use by the public.

NOISE

The once-through cooling system using wastewater would involve no significant noise sources that were not addressed in the **Noise** section of the Final Staff Assessment, except that additional construction would be required for the pipelines. Construction procedures required for ESPR and operational procedures (pumping etc.) would probably be the same as, or similar to, those required at the power plant site for seawater cooling.

These noise sources are included in the Final Staff Assessment noise level predictions, and any necessary mitigation measures were addressed by the original acoustical design of the project. To ensure compliance with the proposed noise-related Conditions of Certification, the operator would have to ensure that any required changes in pump types, sizes and locations, and their resulting noise emissions, are accounted for in the plant design and noise mitigation measures. Based on the conceptual design information available, at this time, it does not appear that any such changes would result in significant noise impacts.

PUBLIC HEALTH

General Impacts of Using Reclaimed Water

Any public health impacts from cooling-related use of reclaimed water would result from public exposure to any toxic constituents that could pose cancer and non-cancer risks. The potential for such impacts would depend on the concentrations of such toxicants in the treated water. The purpose of secondary treatment is to reduce the levels of such constituents to levels appropriate to the proposed use of the water.

Secondary Treated Water Discharged at Hyperion

General standards for acceptable levels of toxic constituents of secondary treated water (as currently produced at the existing Hyperion Treatment Plant) have been established and they are low enough for safe use in the enclosed, once-through cooling system being considered at ESPR.

Conclusion for Public Health

Once-through cooling using reclaimed water would create minimal human exposure to any potentially toxic constituents of the utilized water because the once-through system is a closed system. This means that there would be minimal exposure-related health risks (and therefore no public health differences) from continued use of either seawater or reclaimed water from secondary treatment facilities.

SOCIOECONOMIC RESOURCES

General Impacts of Using Reclaimed Water

Cooling with reclaimed water would not have significant impacts on employment or housing demand in El Segundo or surrounding communities, and thus would not impact schools. As with other power plant designs, direct fiscal impacts on the community should be positive because of higher property values for a new plant than for the existing plant. Use of reclaimed water for cooling would require an agreement with the WBMWD or City of Los Angeles to acquire and possibly treat water from Hyperion. Payment to the City or WBMWD for use of the water would provide fiscal benefits to the public agencies and ratepayers who pay for water treatment. Construction of pipelines, depending on which route is chosen, could cause temporary disruption to vehicles on Vista del Mar and beach users along the proposed pipeline right-of-way. However, if proper measures are taken to minimize the disruption, this should be a less than significant community impact.

Secondary Treated Water Discharged at Hyperion

The suggested design would require two parallel pipelines between the ESPR project and the Hyperion facility. Socioeconomic impacts would remain positive but relatively insignificant. Construction of the pipelines should be staged to minimize conflicts with peak season beach utilization, which provides economic benefits to nearby communities.

Conclusion for Socioeconomic Resources

The use of secondary treated water in once-through cooling should have positive short-term employment impacts, and probably will generate positive fiscal benefits to the water provider. Construction and operation of the ESPR project with or without use of reclaimed water for cooling should not have any significant adverse socioeconomic impacts.

With standard construction mitigation practices, potential adverse impacts on beach visitor days associated with pipeline construction can be kept to less than significant levels.

TRAFFIC AND TRANSPORTATION

General Impacts of Using Reclaimed Water

Traffic and transportation impacts associated with the use of different cooling methods for the project are minimal and would be associated primarily with pipeline construction.

Secondary Treatment, Discharge at Hyperion

Hyperion currently discharges secondary treated water through its seven-mile discharge pipe to the ocean. ESPR could use this secondary treated water for cooling, and then return the warmed water to Hyperion for disposal through its existing discharge pipe. This option would require construction of a second pipeline from Hyperion to ESPR (one pipeline would transport water in each direction).

The transportation impacts associated with this option remain focused on construction activity of both pipelines (to and from ESPR from Hyperion) located adjacent to each other under Vista Del Mar and across the driveways to the parking lots located on Dockweiler State Beach. Two routing alternatives have been proposed, to install the pipelines west of Vista Del Mar, or to install the pipelines in the roadway.

Pipeline Construction West of Vista Del Mar

If construction activity or maintenance activity were required within any public road right-of-way, then applicable LORS would be enforced and the recommended Conditions of Certification of the Final Staff Assessment for the project would include the development of a Transportation Management Plan containing a Traffic Control Plan to mitigate any impacts associated with construction activities in the public roadway to a level of insignificance.

Pipeline Construction Installed in Vista Del Mar

In this option, the two pipelines between ESPR and Hyperion would be installed within the roadway. These pipelines will be used to acquire and return the reclaimed water

from the Hyperion facility. The construction activity to install these two pipelines would require a common trench 14 to 16 feet wide.

Vista Del Mar is a four-lane undivided secondary arterial roadway. This roadway travels in a north-south direction parallel to the beach. Traffic flow along this roadway is not exceedingly heavy but varies during the day with a peak northbound morning traffic flow between 7:00 and 9:00 a.m. In the evening the peak traffic flow is southbound between 4:00 and 7:00 p.m.

Construction planning in the Vista Del Mar roadway must consider the timing of the existing peak traffic and additional traffic on Vista Del Mar associated with an ESGS pipeline. A majority of the construction traffic for the ESGS would be expected to access the plant site via I-105 or I-405 exiting onto Imperial Highway traveling to the plant site on Vista Del Mar.

Therefore, the traffic control plan for roadway construction would need to consider the effect of lane closure on Vista Del Mar during pipeline construction and the timing and volume of construction traffic. The traffic control plan should be developed in consultation with the Cities of El Segundo and Los Angeles. The traffic control plan should follow the measures contained in Caltrans, Manual of Traffic Controls for Construction and Maintenance Work Zones. Consideration should also be given to limiting construction activity outside of peak traffic hours for the lanes affected. Working with the Cities of El Segundo and Los Angeles, it should be possible to develop a traffic control plan for construction activity in the Vista Del Mar roadway that would have a less than significant impact on traffic.

Conclusion for Traffic and Transportation

The use of reclaimed water would involve the construction of two pipelines to Hyperion. Traffic and transportation impacts are expected to be minimal since the applicant would comply with applicable LORS and the provisions of a Transportation Management Plan/Traffic Control Plan.

VISUAL RESOURCES

General Impacts of Using Reclaimed Water

The principal visual effect of using reclaimed water would result from temporary impacts of construction of a required pipeline to transport reclaimed water from Hyperion approximately one mile north of the proposed ESPR project.

Secondary Treated Water Discharged at Hyperion

The two pipelines between Hyperion and ESPR could parallel Vista del Mar at the roadway's west shoulder or be built in the roadway itself. Though trenching and construction in the roadway or in the shoulder could have adverse visual impacts from the presence of construction equipment, these would be temporary and of relatively short duration. With the following mitigation measures, impacts of this option would be short-term and less than significant.

Mitigation Measures

Mitigation measures for visual impacts should limit the overall period of construction for both pipelines to less than four months. Any removed landscaping shall be limited to the minimum extent feasible, and replaced on a one-to-one basis. With these measures, visual impacts would be short-term and less than significant. If the applicant were to amend its proposal to include the use of reclaimed water for cooling, the applicant would be required to submit a detailed proposal necessitating additional staff review. Staff would analyze this proposal at that time. Because the specific project characteristics of an amended project are not known, no Conditions of Certification are presented at this time.

Conclusion for Visual Resources

With recommended mitigation measures as described above, the use of reclaimed water for cooling at the ESPR project would not create any significant visual effects.

WASTE MANAGEMENT

General Impacts of Using Reclaimed Water

Project excavation may encounter potentially contaminated soils and/or groundwater. However, excavation would not be necessary in tidal or offshore areas for any of the alternatives, so effects to these areas will be the same as the preferred project. Refer to the **Waste Management** section of the FSA for discussions on contaminated soils and groundwater that specify appropriate mitigation measures and Conditions of Certification to ensure less than significant impacts.

Secondary Treated Water Discharged at Hyperion

This option would require the construction of one pipeline to the ESPR project site and a second pipeline back to Hyperion. The overall trenching and right of way for soil stockpiles would disturb approximately four acres.

Excavation activities may encounter potentially contaminated soils and/or groundwater. Therefore, proper handling and disposal procedures may be necessary. A Phase I Environmental Site Assessment will be needed for the pipeline route prior to excavation. Follow-up testing as part of a Phase II Environmental Site Assessment may also be needed. Refer to the **Waste Management** section of the FSA for discussions on contaminated soils and groundwater that specify appropriate mitigation measures and Conditions of Certification to ensure impacts are less than significant.

Conclusion for Waste Management

The reclaimed water use option would consist of onsite and offsite earthmoving activities and would temporarily disturb approximately four to five acres. However, Phase I and perhaps Phase II Environmental Site Assessments will be necessary to ensure that hazardous wastes are remediated prior to site preparation. With these steps taken, impacts can be mitigated to less than significant levels.

WATER AND SOIL RESOURCES

General Impacts of Using Reclaimed Water

Earthmoving for construction of a wastewater pipeline from Hyperion and other appurtenant structures could potentially induce erosion and sedimentation, which may impact water quality via an increase in sediment load within nearby receiving waters. Project excavation may encounter potentially contaminated soils and/or groundwater. Refer to the **Waste Management** Section of the FSA for further discussion regarding contaminated soils and/or groundwater.

Thermal impacts related to the heat contained in the cooling water discharge from these options will result in an increase in temperature of the water discharged to the ocean with the potential for adverse impacts to biota. In addition, a new NPDES permit would likely be required for the changed discharge temperature and constituents. Impacts on the biological communities are discussed in the **Aquatic Biology** section of this analysis.

The earthmoving activities required for use of reclaimed water would need to be addressed as part of the overall ESPR project NPDES permit for stormwater discharge from construction activities. The permit would require that the applicant develop a Stormwater Pollution Prevention Plan (SWPPP) that identifies Best Management Practices (BMPs) employed to preserve stormwater quality.

As with any other waste discharge, compliance with the thermal limits contained in the NPDES permit would be necessary. If thermal limits are exceeded by these options, either a waiver to the thermal limits or a modified design and operational plan may be necessary. If process waste streams or other waste streams are discharged with the treated cooling water, which has less volume relative to the currently proposed project, constituent concentrations in the cooling water discharge may increase, and would be subject to NPDES effluent limits.

Secondary Treated Water Discharged at Hyperion

Earthmoving Impacts

This option would entail the construction of a pipeline to the ESPR project site and a second pipeline back to Hyperion. Each pipeline would be six to ten feet in diameter and approximately one mile long. The overall trenching and right of way for soil stockpiles would disturb approximately four acres. Because a SWPPP would be required and the project would need to comply with the Clean Water Act, impacts related to erosion and sediment control and stormwater runoff would be less than significant.

Excavation activities may encounter potentially contaminated soils and/or groundwater; therefore, proper handling and disposal procedures may be necessary. Refer to the **Waste Management** section of the FSA for discussions on contaminated soils and groundwater that specify appropriate mitigation measures and Conditions of Certification to ensure impacts are less than significant.

Thermal Impacts

In this option, the cooling water would be returned to Hyperion and discharged with the Hyperion effluent. When the thermal discharge of the ESPR project (150 MGD) is added to the remainder of the Hyperion discharge volume (for a total of 450 MGD), the resulting temperature rise is expected to be 7°F, given the fixed flow volumes above. With actual volumes the rise may be from zero (no ESPR operation) to 19°F (early hours, high ESPR load). The effect of this temperature rise will be to increase the buoyancy of the Hyperion effluent, and cause the plume to rise higher in the water column than it would without the heated water. The outfall discharge is located beneath the thermocline; a study will need to be conducted to see if the increased temperature will break the thermocline and cause the plume to rise to the surface. However, temperature has a smaller effect on buoyancy than salinity, and this impact may be small.

Conclusion for Soil and Water

Compliance with LORS

A detailed analysis of LORS compliance is beyond the scope of this assessment. Dilution ratios and blowdown water quality effects for some constituents are expected to remain approximately the same as the proposed project, and would be regulated by a new NPDES permit. If process waste streams or other waste streams are discharged with the secondary treated cooling water, which has less volume relative to the currently proposed project, constituent concentrations in the cooling water discharge may increase, and would be subject to NPDES effluent limits. The discharge would also need to be kept in compliance with the thermal limits contained in any new or revised NPDES permit for Hyperion.

Earthmoving Impacts

Because existing intake structures and outfall structure would be used for the ESPR project, the options considered herein would not require any earthmoving and/or dredging and filling within the Santa Monica Bay. However, minor maintenance dredging activities would periodically be required around the intake structure, as for the proposed project using seawater for cooling. Such activities may require a permit from the Army Corps of Engineers. Sedimentation impacts would be less than significant with BMPs such as silt curtains and limiting the amount of dredging.

The reclaimed water use option would consist of onsite and offsite earthmoving activities and could temporarily disturb up to five acres. However, because the earthmoving activities would be temporary, BMPs would be employed to minimize erosion and sedimentation, and with all affected areas returned to stable conditions impacts would be less than significant.

Thermal Impacts

In all cases, because of the relatively small discharge depth below the water surface, the maximum surface temperature rise would be essentially equal to the discharge temperature rise.

The increased temperature of the Hyperion effluent would increase its buoyancy and cause the plume to rise higher in the water column than normally. However, temperature has a smaller effect on buoyancy than salinity and therefore this impact may be small. As with any other waste discharge, compliance with the thermal limits contained in the NPDES permit would be necessary.

WORKER SAFETY AND FIRE PROTECTION

General Impacts of Using Reclaimed Water

Project excavation may encounter potentially contaminated soils and/or groundwater. However, excavation would not be necessary in tidal or offshore areas for any of the alternatives, so effects to these areas will be the same as for the proposed ESPR project. Refer to the **Waste Management** and **Worker Safety/Fire Protection** sections of the FSA for discussions on contaminated soils and groundwater that specify appropriate mitigation measures and Conditions of Certification to ensure less than significant impacts. Additionally, worker health and safety issues might arise through the proposed use of secondary treated reclaimed water. Secondary treated water contains pathogens at concentrations greater than tertiary treated water and thus an increased risk to workers might exist.

Secondary Treated Water Discharged at Hyperion

Excavation activities for pipeline construction may encounter contaminated soils and/or groundwater. Therefore, proper handling procedures may be necessary. A Phase I Environmental Site Assessment would be needed for the site and the pipeline route prior to site preparation and a Phase II Environmental Site Assessment may also be needed. Once proper environmental site assessments have been conducted, the potential impacts to workers will be clearer. Standard worker safety regulations, including those for trenching, confined spaces, and exposure to hazardous wastes must be followed. Please also refer to the **Waste Management** and **Worker Safety/Fire Protection** sections of the FSA for discussions on contaminated soils and worker safety standards that specify appropriate mitigation measures and Conditions of Certification to ensure impacts on workers are less than significant.

Fire protection impacts are expected to be the same as those identified for the construction and operations of the proposed ESPR project as described in the FSA and can be addressed by adherence to the LORS and proposed Conditions of Certification found in that document.

If workers are exposed to secondary treated water during maintenance or leaks, they could be exposed to pathogens and other substances remaining in the treated water. Residual substances (metals and organics) would be present at varying (unknown) levels in secondary treated wastewater. Pathogens would also be present. If treated to tertiary standards, biologicals (bacteria, viruses, or prions) are not expected to be present in concentrations sufficient to pose a significant risk to workers. However, if treated to only secondary standards, which is proposed in this case, additional treatment may be required to meet Department of Health Services' regulations (found in CCR Title 22 § 60306). Although this regulation addresses use of reclaimed water in cooling towers, its application in this case would ensure that workers would not be

exposed to pathogenic organisms including Coliform bacteria, viruses, and perhaps Legionella.

As previously discussed in the **Health Requirements** section of this report, another option was suggested by Mr. Jeffrey Stone, Chief, Recycled Water Division, at DHS. It is possible that, based on a complete safety study of the proposed system, disinfection might not be required. This allowance may occur because the system would be closed, would not have faucets attached, and would not traverse areas where members of the public could be exposed to drinking the water. An educational program for workers in the power plant would be required to assure that workers would be protected from disease agents that could exist in the secondary effluent. This situation would parallel that of the WBMWD employees and Hyperion plant staff who deal with the Hyperion secondary effluent prior to and during its treatment to tertiary standards; thus there is a precedent for this type of allowance.

Conclusion for Worker Safety and Fire Protection

The reclaimed water use option would consist of onsite and offsite earthmoving activities and would temporarily disturb approximately four to five acres. Worker safety regulations, including those addressing trenching, confined spaces, and hazardous wastes must be followed. Additionally, Phase I and perhaps Phase II Environmental Site Assessments would be necessary to ensure that potential hazardous wastes are remediated prior to site preparation. Pathogens such as bacteria, viruses, or prions may be present in secondary treated water in concentrations sufficient to pose a significant risk to workers. However, if treated to meet Department of Health Services' regulations (found in CCR Title 22 section 60306), this risk can be reduced to insignificance. Thus, impacts on workers can be mitigated to less than significant.

Fire protection impacts are expected to be no different from those identified for the construction and operations of the proposed ESPR project as described in the SA and can be mitigated by following all LORS and the proposed Conditions of Certification.

POWER PLANT EFFICIENCY

General Impacts of Using Reclaimed Water

In a combined-cycle power plant such as the ESPR project, roughly two-thirds of the electrical energy produced is generated by the gas turbine generators; the remaining one-third is generated by the steam turbine generator. The thermodynamic cycle that operates the steam turbine includes a condenser, in which spent steam that has driven the steam turbine is condensed into water. This condensing action is accomplished by transferring heat from the steam to cooling water, which then carries the heat away. As the steam condenses into water, a vacuum is created in the condenser behind the steam turbine. The more effectively heat is removed, the stronger this vacuum is, and the more power the steam turbine produces.

The efficiency of the steam cycle, and thus of the entire power plant, can be affected by the ability of the cooling water to carry away this heat of condensation. In the existing power plant, and in the ESPR project as proposed in the AFC, ocean water is pumped through the condenser, picks up heat, and is then returned to the ocean. If an alternative

cooling system were employed that removes heat less effectively than the proposed ocean water system, then the condenser vacuum would not be as great, and the steam turbine would produce less power while consuming the same amount of energy. This would result in a reduction in efficiency.

The proposed project would circulate 148,000 gpm (213 MGD) of ocean water through the condenser; this water would be taken in at a relatively constant temperature of 60°F. After absorbing the spent steam's heat of condensation, it would be returned to the ocean at a temperature of 78°F. This cooling flow would yield a condenser backpressure of approximately 1.14 inches of mercury (in. Hg). This represents very effective cooling, producing minimum backpressure. (Atmospheric pressure, representing no vacuum at all, is nominally 29.92 in. Hg.)

Secondary Treated Water Discharged at Hyperion

Secondary treated water from Hyperion would be supplied to the condenser at a flowrate between 100 and 150 MGD, in a temperature range of 68 to 85°F. Assuming the lower flowrate of 100 MGD, the water would produce a condenser backpressure of approximately 2.18 in. Hg. This could be expected to produce a reduction in power plant efficiency of approximately one percent at maximum combined cycle output, and approximately 1.25 percent at peaking output.

Conclusion for Power Plant Efficiency

Energy Commission staff believes that a one to 1.25 percent drop in efficiency is fully acceptable in order to achieve a reduction in impacts on aquatic biota.

POWER PLANT RELIABILITY

Reliability Impacts of Using Reclaimed Water

A reliable supply of condenser cooling water is essential for full operation of the ESPR project. If the flow of cooling water were interrupted, the steam turbine generator would have to be shut down, causing the loss of full generating capacity.

Secondary treated water from Hyperion would be supplied to the plant's condenser for use in condensing spent steam in the steam turbine cycle. The Hyperion plant has exhibited remarkable reliability; Energy Commission staff could find no evidence of untreated sewage being discharged into Santa Monica Bay as a result of plant failure for many years.

The system to deliver secondary treated water to the ESPR project, consisting of piping, pumps, and valves, can be expected to be extremely reliable. These components are typically very reliable, and redundant equipment could be installed where advisable.

Conclusion for Power Plant Reliability

Employing secondary treated reclaimed water from Hyperion for condenser cooling would likely not compromise power plant reliability compared to continued use of ocean water-cooling.

CONCLUSION

Section 3 of this report describes the potential impacts of once-through cooling using secondary treated reclaimed water. This option could replace the proposed once-through cooling using seawater for the ESPR project. This study was undertaken because of potential significant impacts from the latter on marine biological resources. Following is a summary of conclusions.

Staff finds that the use of reclaimed water in once-through cooling appears to be a feasible technology in this situation. The most significant concerns regarding the use of reclaimed water are the design of the transfer facilities (between Hyperion, WBMWD, and ESPR) and the potential cost of the water itself. The WBMWD has not published a rate for secondary treated water to be used in power plant cooling. This option could be implemented only with specially negotiated rates.

The environmental and engineering disciplines can be divided into two groups: those with the potential for significant impacts, and those in which impacts are easily mitigable or less than significant. Disciplines in which impacts would be less than significant for the use of reclaimed water for once-through cooling are the following:

- Terrestrial Biological Resources
- Cultural Resources
- Hazardous Materials Management
- Land Use
- Noise
- Public Health
- Traffic and Transportation
- Socioeconomic Resources
- Visual Resources
- Waste Management
- Water and Soil Resources
- Worker Safety and Fire Protection
- Power Plant Efficiency

There is a remaining concern about compliance with LORS: no determination has been made that the system described herein can clearly comply with NSDES discharge requirements. A conclusion regarding this issue cannot be made based on the conceptual design information available at this time.

Potential impacts from once-through cooling with reclaimed water are of concern to marine biological resources. In addition, construction-related air emissions would be considered significant if not mitigated. Each of these concerns is summarized below.

- **Marine Biological Resources:** The use of reclaimed water to cool Units 5, 6, and 7 would significantly reduce impingement and entrainment effects as compared to the existing condition. If treated water from Hyperion is used to cool Units 5, 6, and 7 and then discharged through the existing Hyperion outfall five miles offshore, minimal impacts to marine resources would be expected. Impacts of impingement and entrainment from Units 5, 6, and 7 would be eliminated and the increased temperature of the discharge water would not add significantly to the existing impacts of the Hyperion discharge. Also, as stated in the **Water and Soil Resources** discussion in Section 4 above, discharge of heated secondary treated water through Hyperion would require a new NPDES permit from the RWQCB.

- **Air Quality:** Construction of large pipelines to and from Hyperion could create significant PM₁₀ impacts. These impacts may be mitigable to less than significant levels but this cannot be assured without specific information on construction equipment, scheduling, and dust control measures.

WATER FLOW CONVERSION

The following conversion table is provided as a ready reference for the differing engineering units used for flow in this report.

EL SEGUNDO COOLING OPTIONS TABLE 2 Conversion Table – Large Volume Flows

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CULTURAL RESOURCES

Testimony of Jeanette A. McKenna and Dorothy Torres

INTRODUCTION

The purpose of this analysis is twofold. Staff evaluates potential impacts caused by the proposed project on previously identified cultural resources. Secondly, staff evaluates potential impacts to cultural resources that might be discovered as a result of activities during the over all construction and demolition process.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS (LORS)

FEDERAL

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

National Historic Preservation Act, 16 U.S.C. section 470, commonly referred to as Section 106, requires federal agencies to take into account the effects of their undertakings on historic properties through consultations beginning at the early stages of project planning. The regulation was revised in 1997 (36 CFR Part 800 et seq.) to set forth procedures to be followed for determining eligibility of cultural resources, determining the effect of the undertaking on the historic properties, and how the effect will be taken into account. The eligibility criteria and the process are used by federal agencies. Very similar criteria and procedures are used by the state in identifying cultural resources eligible for listing in the California Register of Historical Resources.

STATE

The term "cultural resource" is used broadly to include the following categories of resources that are identified pursuant to California Code of Regulations, Title 14, Chapter 11.5, Section 4852. A list of categories of potential resources appears below.

Types of resources eligible for nomination:

1. Building. A resource, such as a house, barn, church, factory, hotel, or similar structure created principally to shelter or assist in carrying out any form of human activity. 'Building' may also be used to refer to an historically and functionally related unit, such as a courthouse and jail or a house and barn;
2. Site. A site is the location of a significant event, a prehistoric or historic occupation or activity, or a building or structure, whether standing, ruined, or vanished where the

location itself possesses historical, cultural, or archeological value regardless of the values of any existing building, structure, or object. A site need not be marked by physical remains if it is the location of a prehistoric or historic event, and if no buildings, structures, or objects marked it at that time. Examples of such sites are trails, designed landscapes, battlefields, habitation sites, Native American ceremonial areas, petroglyphs, and pictographs;

3. Structure. The term 'structure' is used to describe a construction made for a functional purpose rather than creating human shelter. Examples of structures included mines, bridges and tunnels;
4. Object. The term 'object' is used to describe those constructions that are primarily artistic in nature or are relatively small in scale and simply constructed, as opposed to a building or a structure. Although it may be movable by nature or design, an object is associated with a specific setting or environment. Objects should be in a setting appropriate to their significant historic use, role, or character. Objects that are relocated to a museum are not eligible for listing in the California Register. Examples of objects include fountains, monuments, maritime resources, sculptures, and boundary markers; and
5. Historic district. Historic districts are unified geographic entities that contain a concentration of historic buildings, structures, objects, or sites united historical, culturally, or architecturally. Historic districts are defined by precise geographic boundaries. Therefore, districts with unusual boundaries require a description of what lies immediately outside the area in order to define the edge of the district and to explain the exclusion of adjoining areas. The district must meet at least one of the criteria for significance discussed in Section 4852 (b)(1)-(4) of this chapter.

When a cultural resource is determined to be historically significant or significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California, it may be considered to be an "historical resource" and eligible for inclusion in the California Register of Historic Resources (CRHR).

If the archaeological resource does not meet the criteria for an historical resource, it may be assessed to determine whether it meets the criteria of a unique resource as defined in the Public Resources Code.

This Final Staff Assessment will provide an overview of procedures used to identify cultural resources in the project vicinity. If cultural resources are identified, staff determines whether there may be a project related impact to identified resources and if the resource is eligible for the CRHR, staff then recommends mitigation that will reduce the impact to the historical resource to a less than significant level.

There is also a potential that a project may impact a resource that has not been previously discovered or impact an historical resource in an unanticipated manner. Staff also recommends procedures that mitigate these potential impacts.

Four prehistoric sites are located in the vicinity of the El Segundo Power Redevelopment Project (ESPR). These sites have been previously recorded, but not evaluated for eligibility to the CRHR. Moreover, there are two historic properties and one historic district also in the project vicinity. The historic sites and historic district appear eligible for listing on the CRHR and the applicant plans to avoid them. Cultural Resources monitoring, often including a Native American monitor in areas where ground disturbance might unearth previously undiscovered cultural resources, would mitigate potential impacts.

- Public Resources Code, Section 5020.1 defines several terms, including the following:
 - (j) “Historical resource” includes, but is not limited to, any object, building, structure, site, area, place, record, or manuscript which is historically or archaeologically significant, or is significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California.
 - (q) “Substantial adverse change” means demolition, destruction, relocation, or alteration such that the significance of an historical resource would be impaired.
- Public Resources Code, Section 5024.1 establishes a California Register of Historic Resources (CRHR). The implementing regulations are California Code of Regulations, Chapter 11.5, Section 4850 et seq.
- The California Environmental Quality Act (CEQA) (Public Resources Code, Section 21000 et seq.; Title 14, California Code of Regulations, Section 15000 et seq.) requires analysis of potential environmental impacts of proposed projects and requires application of feasible mitigation measures.
- Public Resources Code Section 21083.2 states that the lead agency determines whether a project may have a significant effect on “unique” archaeological resources; if so, an EIR shall address these resources. If a potential for damage to unique archaeological resources can be demonstrated, the lead agency may require reasonable steps to preserve the resource in place. Otherwise, mitigation measures shall be required as prescribed in this section. The section discusses excavation as mitigation; limits the applicant’s cost of mitigation; sets time frames for excavation; defines “unique and non-unique archaeological resources”; and provides for mitigation of unexpected resources.
- Public Resources Code Section 21084.1 indicates that a project may have a significant effect on the environment if it causes a substantial adverse change in the significance of a historic resource; the section further defines a “historic resource” and describes what constitutes a “significant” historic resource.
- CEQA Guidelines, Title 14, California Code of Regulations, Section 15126.4(b) prescribes the manner of maintenance, repair, stabilization, restoration, conservation, or reconstruction as mitigation of a project’s impact on a historical resource; discusses documentation as a mitigation measure; and discusses mitigation through avoidance of damaging effects on any historical resource of an archaeological nature, preferably by preservation in place, or by data recovery through excavation if avoidance or preservation in place is not feasible. Data recovery must be conducted in accordance with an adopted data recovery plan.

- CEQA Guidelines, Section 15064.5 defines the term “historical resources,” explains when a project may have a significant effect on historic resources, describes CEQA’s applicability to archaeological sites, and specifies the relationship between “historical resources” and “unique archaeological resources.”
- Penal Code, Section 622 1/2 states that anyone who willfully damages an object or thing of archaeological or historic interest is guilty of a misdemeanor.
- California Health and Safety Code, Section 7050.5 states that if human remains are discovered during construction, the project owner is required to contact the county coroner.
- Public Resources Code, Section 5097.98 defines procedures for notification of discovery of Native American artifacts or remains and for the disposition of such materials. This section also prohibits obtaining or possessing Native American artifacts or human remains taken from a grave or cairn and sets penalties for these actions.
- Public Resources Code Section 5097.99 provides restrictions on the possession of human remains or grave related artifacts. Part (b) specifies exceptions and states a person in violation of this section is guilty of a felony. Part (c) expands the section to say that any person, not under authority of law, who removes Native American artifacts or human remains with an intent to sell or vandalize them is guilty of a felony.

LOCAL

City of El Segundo

The City of El Segundo does not have a specific ordinance pertaining to cultural resources, but follows all the provisions of CEQA. In the event resources are discovered, the City requires notification of the appropriate administering entity (ESPR 2000a, p. 5.7-71).

City of Manhattan Beach

The City of Manhattan Beach does not have a specific ordinance pertaining to cultural resources, but defers to CEQA and insists that notification of the appropriate entities occurs (ESPR 2000a, p. 5.7-71).

City of Los Angeles

The City of Los Angeles does not have any specific City LORS that pertain to cultural resources. The city follows the provisions of CEQA and requires that the appropriate entities are notified regarding any discoveries of cultural resources (ESPR 2000a, p.5.7-71).

ENVIRONMENTAL SETTING

REGIONAL DESCRIPTION

Surficial sedimentary units of predominantly Pleistocene and Holocene age underlie the entire project area. These sediments include depositions that range from continental, alluvial fan-derived sediments to sub-aerial floodplain to marine terrace and near shore deposits. Lithologies include sand, gravel, silt and clay. The successive series of

Pleistocene marine terraces that have undergone geomorphic development have been subsequently dissected by the major west flowing river drainages of the Los Angeles Basin.

The Cenozoic rock formations range in facies type from conglomerates to sandstone to unconsolidated siltstone and clays, all of which are either fossiliferous or potentially fossiliferous. Gradual, long-term erosion has removed parts of the Tertiary and Quaternary rock throughout most of the project area. These formations or parts of formations now exist at or near the surface as rock outcrops with varying width across the project area terrain, but are obscured in most areas by industrial development and surficial sediments. The majority of the plant site area is overlain by imported fill or is comprised of unconsolidated sediments of Holocene age.

Many of the temporary staging and parking components lie within the ancient Los Angeles River floodplain and river basin. The Ballona Creek serves as a secondary drainage flowing to the southwest along the base of the Del Rey bluffs. Rainfall averages about twelve inches per annum in the Los Angeles Basin. The bluffs probably supported grasslands in prehistoric times, and in the 1900s, the area around Ballona Lagoon was essentially swamp, thickets, and a rather rich riparian environment (ESPR 2000g, p.J-6).

PROJECT VICINITY DESCRIPTION

The El Segundo Power Redevelopment (ESPR) project area involves acreage within the City of El Segundo, Los Angeles County, California. “The project area is localized along the Pacific Ocean shoreline of the Los Angeles Basin. Specifically, the proposed ESPR project components are limited to the geomorphologic transition zone extending from the sandy beaches up to the Late Pleistocene and Holocene stabilized sand dunes immediately east, on the adjacent bluffs above the shoreline” (ESPR 2000g, p. J-7).

The proposed primary ESPR project components are located in El Segundo, and would extend westward from the sandy beaches into stabilized sand dunes located on the adjacent shoreline bluffs.

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

PREHISTORIC SETTING

The majority of Southern California was inhabited, at one time or another over the past 10,000+ years, by prehistoric Native Americans. The prehistoric occupation of this area is well within the boundaries of the much discussed and cited chronologies for Southern California, specifically those of Warren (1968), Wallace (1955), and more recently, Mason and Peterson (1994). This particular area of Southern California is associated with the ancestors of the Gabrieleno/Tongva and Chumash.

The Los Angeles plain and fringing coastline has supported a continuous cultural occupation for at least the last 8000 years. An archaic occupation has been identified in the archaeological record that reflects the early emergence of non-agricultural village-based groups in the Los Angeles Basin. Current archaeological evidence suggests that

a relatively small population existed in the basin until approximately 2000 years before present (B.P.). After that temporal marker, populations appear to have expanded considerably into resource-rich coastal and near-shore estuarine environments. Report from early European contacts to the area such as Juan Rodriguez Cabrillo and Sebastian Vizcaino indicated that some of the larger coastal villages had hundreds of occupants. These observations appear to be supported by the archaeological evidence, although by the late 18th Century, reports indicate that the Los Angeles City environs supported only a small but established hunter/gatherer culture. Mason and Peterson (1994) suggest that the coastal populations migrated away from the coast and back to the coast in response to environmental factors – suggesting a break in the archaeological records in certain areas of Southern California (ESPR 2000g, p.14).

ETHNOGRAPHIC BACKGROUND

Seasonal migrations of these various populations make delineation of their respective traditional territories difficult to define. The location of the project area, however, suggests a strong association with the Gabrielenos (ESPR 2000g, p.14).

The earliest evidence of human occupation in the immediate area of the Del Rey bluffs comes from the Lambert study of 1983, where the southern fringes of the Ballona Lagoon and creek have been identified within a few miles of the current study area. The evidence is based on the presence of non-fluted projectile points and crescents. Such remains have been compared to artifacts identified further east, in the Mojave Desert regions, suggesting a correlating date of occupation in the ca. 9,000 B.P. range. (ESPR 2000g, p. 19).

In Southern California, the Millingstone period has been identified as at least 6,000 years of age and likely dates in some areas to 8,500 years B.P. This particular period is characterized by the presence of artifacts indicative of seed processing (e.g., metates, manos, other hand stones, flaked tools). Overall, the populations were dependent on a hunter/gatherer economic base supplemented by exploitation of the ocean resources (e.g., fishing and collecting of shell fish) (ESPR 2000g, p. J-10).

On the Del Rey bluffs, the presence of desert culture-related artifacts and cremations, a noticeable lack of shell ornamentation, and the apparent lack of marine resources suggest a change in the population. This is generally attributed to the presence of Shoshone speakers from the Desert regions (also referred to as the Shoshonean Intrusion; see McCawley 1996) (ESPR 2000g, p. J-10).

For approximately 500 years prior to Spanish contact, the western Los Angeles Basin was occupied during the Late Prehistoric by the “Canalino” culture known for their ability to exploit the ocean resources. The coastal site typically exhibited an abundance of shellfish and other marine resources. In the specific area of the current project, CA-LAN-47, a Late Prehistoric Gabrielino village site, has yielded inhumations, stone bowl, projectile points, pestles, and scrapers all indicative of a Gabrielino presence. The site is described as a seasonal village for the procurement of resources along Ballona Lagoon (ESPR 2000g, p.13).

HISTORIC SETTING

The first recorded contact with Southern California Native Americans (including the Gabrielino) involved the Spanish exploration led by Juan Rodriguez Cabrillo in 1542. Many years later, in ca. 1769, the Portola Expedition traversed present-day Los Angeles County and made direct contact with the Native population. Shortly thereafter, the Spanish Missionaries led by Father Junipero Serra began establishing the missions throughout California. The references to the Gabrielino are directly related to the founding of the Mission San Gabriel in the San Gabriel Valley of Los Angeles County (ESPR, 2000g, p. J-13).

The City of Los Angeles was officially founded in 1786 and by 1800 there were as many as 30 small adobe structures in the area. The current project area (El Segundo) is well outside this early settlement. The Spanish government lost its claim to California ca. 1824 and California became part of the Mexican government holdings. Mexico's control was short-lived, yielding to the American government in 1848, following the Mexican-American War (ESPR 2000g, J-13).

The City of El Segundo began as a "melon patch" and in 1911 was surveyed by representatives of the Standard Oil Company. The community was called "El Segundo" because it was the second Standard Oil Refinery location in Southern California. The City of El Segundo was incorporated in 1917 and developed into an industrial center when the farming activities gave way to commercial development, eventually including an airfield and other commercial ventures (ESPR 2000q, p. 4).

El Segundo is located within the lands of the historic Rancho El Sausal Redondo, a 25,000 acre Mexican Period land grant originally granted to Ygnacia Abila in 1837 (ESPR 2000q p. 4). The rancho remained in Abila's family for ten years following his death (d. 1868) and, in 1868, the property was sold to Robert Burnett. Daniel Freeman, who leased the rancho from Burnett, eventually purchased the property in 1882. Freeman was successful in raising grains, citrus, and other "truck" crops, including melons. Freeman sold the majority of the rancho by 1886, including the lands currently occupied by the City of El Segundo.

The arrival of the Standard Oil refinery in 1911 had a profound effect on the development of early El Segundo. The company almost immediately became the primary employer of the community, resulting in a reference to the "Standard Oil Payroll Town" (ESPR 2000q, p. 5). Residential housing was constructed shortly after the founding of the refinery and privately owned businesses were established throughout the area. Services were established along Richmond Street, El Segundo's first business district. At the time of incorporation, El Segundo had a population of 1,000.

The El Segundo Land and Improvement Company began surveying, grading, and development in 1911, installing curbs, sidewalks, and subdividing 1,470 acres. By 1912, many of the lots had sold, but only nine had been developed. The residential housing boom in El Segundo began with incorporation in 1917. C.D. Goldthwaite, a Los Angeles Contractor, proposed to build "... whole blocks of stock houses from shelf-worn plans ..." without proliferating a "cookie cutter" design (ESPR 2000q, p. 6).

From the onset, the commercial enterprises of El Segundo concentrated on Richmond Street, rather than the adjacent Main Street. Numerous small, wood framed commercial buildings on Richmond on two blocks between Ballona (later El Segundo Boulevard) and the Pacific Electric tracks (Grand). Most of these structures were destroyed in a fire (ca. 1917), resulting in a redevelopment using bricks rather than wood. City Hall was constructed at Richmond and Franklin (1918) with an annex in 1926. This building was destroyed in the 1933 Long Beach Earthquake. By 1921, eleven buildings were reconstructed on Richmond Street. Other streets were developed in the 1920s and early 1930s, resulting on a commercial core for the City. The three major streets within this core were Richmond Street, Main Street, and Grand (ESPR 2000q, p. 7-8).

The 1930s brought the beginnings of the Los Angeles Airport (originally Mines Field) and the aerospace industry to El Segundo – including Douglas Aircraft (1928), Northrup (1932) and North American Aviation (1935). Hughes Aircraft arrived in the 1950s, supplementing the post-World War II military presence in the area (ESPR 2000q, p. 10).

RESOURCES INVENTORY

Literature and Records Search

An archaeological literature and records search was completed through the California State University, Fullerton, South Central Coastal Archaeological Information Center, the local repository for all reports, site records, and maps maintained under the California Historical Resources Information System (CHRIS). An arbitrary APE of one half mile surrounding the plant site and various alignments was assigned by the cultural resources consultants. Supplemental research was completed as needed. Record searches were conducted on October 9, 2000, November 1, 2000 and November 8, 2000 (ESPR 2000g, p.18).

Results of the literature and records search showed that a minimum of 20 cultural resource studies have been completed within one mile of the project area. No previously recorded archaeological sites were identified within the project area, but four have been recorded within project vicinity. These include CA-LAB-47, a village site; CA-LAN-1698, a midden deposit; CA-LAN-2345, another prehistoric village site; and CA-LAN-2386/H, and a World War II era bunker site (ESPR 2000g, p. J-9).

Field Surveys

Field investigations involved four separate activities that required differing approaches:

1. confirmation of areas under pavement;
2. a pedestrian survey of the proposed alternative pipeline alignments;
3. a pedestrian survey of the proposed construction areas, and
4. a survey of historic buildings along the proposed water pipeline routes (ESPR 2000g, p. J-21).

On November 3, 2000, Byron Bass of URS Corporation conducted the field inventory for archaeological resources. The existing El Segundo plant site, including the tank farm area, and proposed linear project areas were surveyed via a pedestrian survey. Systematic, regularly spaced transects were not employed, as the environment is nearly

all built and precluded such an approach. All accessible areas were covered, including those with limited access – the Chevron Marine Terminal and Refinery, the Kramer Staging area, and the Fed-Ex staging/parking area. A second survey on November 28, 2000, provided additional access to those areas sampled earlier (ESPR 2000g, p. J-21).

Architectural Reconnaissance

During the cultural resources surveys, the project team observed several potentially significant historic buildings or structures. Although two of the units at the project site began operation on 1955 and 1956 with the two additional units coming on line in 1964 and 1965, none of these units meet the criteria that would make them eligible for listing on the NRHP or CRHR (ESPR 2000a, Appendix K, p.9-17). Units 1 and 2 which would be demolished were completed in 1956 and the tank farm area that would be used first as an additional construction laydown area and then demolished was also completed in the mid-fifties. The tank area was also assessed by the consultant to the applicant as not significant.

However, there are properties in the vicinity of the project that may have had historic importance. These structures were identified along the proposed potable and reclaimed water pipeline alignments. Due to the proximity of the structures to the alignments and the fact that the alignments involved historic roadways, they were identified and researched, resulting in the identification of potentially significant buildings. Two of the forty-two properties investigated were determined to be potentially significant: the 1911 hotel/boarding house located at 221 Concord Street; the residence at 224 Concord Street, including the rental units at 226 A & B Concord Street. In addition, the Richmond Street Historic District, comprising two blocks between El Segundo Boulevard and Grand Avenue, has been identified and recognized by the City (ESPR 2000q p.16).

An additional potentially historic site is the Kramer site laydown area. It is an area that includes foundations from the early 1950's and will be used as a parking/laydown storage area for the project.

Native American Contacts

The Native American Heritage Commission was contacted in October of 2000, and requested to provide any and all data pertaining to Native American sacred or religious sites within or near the project area. A subsequent request was made in November of 2000, when changes in the project description necessitated additional research. A response from the Native American Heritage Commission was received on November 17, 2000, stating that no known resources were identified in their Sacred Lands File.

Subsequently, local Native American representatives were contacted via certified mail. These individuals, identified through the Native American Heritage Commission's referral listings, were provided with a brief description of the project, maps identifying areas of impact, and were requested to provide any pertinent information regarding the project area. Three responses were received, one person indicated that a letter would be forthcoming. However, no letter has been received. There were two additional responses, one from a Gabrielino representative and one from a Chumash representative; both people expressed concern about ground disturbance in the area.

The Chumash representative said that it was a good idea to include Native Americans during initial surveys because they often aided in identifying sites. He suggested that areas be resurveyed in the company of a Native American monitor. The Gabrielino representative expressed particular concern regarding two areas. No additional specific site data was provided (ESPR 2000g, p. J-5 to J-6 and Attachment C).

IMPACTS

Impacts to cultural resources may result either directly or indirectly during the ground preparation, construction, and operation phases of a project. Direct impacts are those which may result from the immediate disturbance of resources, whether from vegetation removal, vehicle travel over the surface, excavation or other earth-moving activities. Direct impacts may include alteration of the surrounding built environment such that the significance of an historical resource would be materially impaired. Indirect impacts may result from increased erosion due to site clearance and preparation, or from inadvertent damage or outright vandalism to exposed resource materials due to improved accessibility. Since El Segundo is an area where many archaeological sites have previously been identified, cumulative impacts to cultural resources may occur if increasing amounts of land are cleared and disturbed for the development of multiple projects in the vicinity of the proposed project.

The potential for the project to cause impacts to cultural resources is related to the likelihood that such resources are present and whether they are encountered during project development and construction activities. Although the existence of known cultural resources indicates further potential for unknown resources to be encountered, the absence of known resources does not necessarily mean that unknown resources will not be encountered and that impacts will therefore not occur. In addition, the potential for discovery does not measure the significance of individual artifacts or other cultural resources present, since it is impossible to accurately predict what specific materials could be encountered. Furthermore, sometimes the full significance of discovered cultural resources can only be determined after they have been collected, prepared, and studied by professional archaeologists and/or historians.

Project elements described in the **PROJECT DESCRIPTION** section of this Staff Assessment may have the potential to cause significant impacts to cultural resources.

POTENTIAL FOR PROJECT IMPACTS

Because project-related site development and construction would entail ground disturbance, the proposed project has the potential to adversely affect previously unknown cultural resources. Four archaeological sites are known to be located within one-quarter mile of the project area (ESPR 2000g, pp. J-19 to J-20). Moreover, there are three historic properties and one historic district, all but one, identified as potentially significant within the vicinity of the project (ESPR 2000g p. J-24, ESPR 2000q, p.16). These sites include prehistoric and historic resources and represent a variety of resource types. The presence of previously identified sites, structures and features within the project vicinity indicates a potential for discovering previously unidentified resources.

Power Plant Site

The proposed power plant location yielded no physical evidence of cultural resources. Nonetheless, the location is associated with the Ballona Lagoon and Los Angeles River floodplain and, therefore, associated with the alluvial deposits from the eroding San Gabriel Mountains. There is a potential for buried deposits within this property. Units 1 and 2 and the existing tank farm will all be demolished. Removal of Units 1 and 2 may require excavation to a depth of 20 feet. The Units and the tank farm have been determined not to be eligible for recommendation to the CRHR by the consultant to the applicant (ESPR 2000a, Appendix K, p. 19) and staff concurs with that assessment. However, cultural resource monitoring during ground disturbance will be necessary to mitigate any potential impacts to previously undiscovered resources.

Sanitary Discharge line

There was no native soil visible along this pipeline. Ground disturbance in this area has the potential to unearth previously undiscovered cultural resources. Staff recommends cultural resources monitoring during ground disturbance on this pipeline (ESPR 2000g, p. J-23).

Aqueous Ammonia Pipeline

No native soil was observed by the consultant to the applicant during surveys along this pipeline route. It does not appear that this short pipeline, extending primarily through paved areas, will impact any cultural resources. However, there is a potential to encounter buried resources along this route (ESPR 2000g p. J-2). To mitigate for impacts to buried resources, staff recommends cultural resource monitoring during ground disturbance on this pipeline.

Potable Water and Reclaimed Water Pipelines

The various pipeline alternatives are located along existing road alignments. No new roads will be constructed and each alignment involves areas previously disturbed by urban developments. The proposed potable and reclaimed water pipelines will share a route. There are two historic properties and one historic district identified by the consultant to the applicant as potentially eligible for listing on the CRHR within the potential routes for these waterlines. The applicant is requesting approval of a route that will avoid these resources. This route extends along Grand Avenue to Eucalyptus to El Segundo Blvd (ESPR 2000v, p. soil 39). This route will avoid impacts to any of the significant cultural resources. However, given the presence of archaeological sites in the region and the size of the trench that will be needed to accommodate two separate lines, staff recommends monitoring ground disturbance along this pipeline.

Staging Areas/Parking Areas

There are eight proposed staging and/or parking areas. Most of these areas are paved. One area, the Kramer Staging Area is the location of previous industrial activity and existing foundations attest to its previous use. It does not appear that the Kramer Staging Area would meet the requirements for listing on the CRHR. It also does not appear that project activity will damage the foundations. However, the AFC states that grading will occur at the Kramer and Federal Express Staging areas (ESPR 2000a, p. 5.4.3). It is possible that ground disturbance to these areas may yield buried cultural resources. To avoid potential impacts to undiscovered resources, staff recommends cultural resource monitoring during ground disturbance in these areas.

Moreover, since several of the identified sites within one quarter mile of the project are located in the vicinity of staging areas, ground disturbance or activity that requires use of an area that is not already paved should be monitored. Although no adverse impacts have been identified and none are expected due to the presence of sites in the vicinity of some of the staging areas, monitoring is warranted during ground disturbance.

Natural Gas Line

Natural gas will be delivered to the new units via existing pipelines. There will be no ground disturbance associated with the natural gas pipeline (ESPR 2000a, p. 1-3).

Transmission Lines

Existing lines within the boundaries of the existing plant will be used for this project (ESPR 2000a, p. 1-6).

CHARACTERIZATION OF IDENTIFIED RESOURCES

Laws identified in the LORS section of this document apply to the treatment of cultural resources. These laws require the Energy Commission to categorize resources by determining whether they meet several sets of specified criteria. These categories then in turn influence the analysis of impacts to the resources and the activities that may be required to mitigate any such impacts.

Under federal law, only historic or prehistoric sites, objects or features, or architectural resources that are evaluated by a qualified researcher as “important” or “significant” in accordance with federal guidelines typically need to be considered during the planning process. The significance of historic and prehistoric cultural resources is judged in accordance with the criteria for eligibility for nomination to the National Register of Historic Places as defined in 36 CFR 60.4 or to the California Register of Historic Resources. If such resources are determined to be significant, and therefore eligible for listing in either of these registers, they are afforded certain considerations under the National Historic Preservation Act.

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

- a. are associated with events that have made a significant contribution to the broad patterns of our history;
- b. that are associated with the lives of persons significant in our past;
- c. that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values;
- d. that represent a significant distinguishable entity whose components may lack individual distinction; or
- e. that have yielded or may be likely to yield, information important to history or prehistory. Isolated finds by definition do not meet these criteria.

Isolated finds by definition do not meet these criteria.

Resources determined not to be significant under the NHPA, that is not eligible for Nation Register listing, are subject to recording and documentation only, and are afforded no further consideration. However, occasionally certain resources, although they may not be eligible for inclusion in the NRHP may nonetheless be of local or regional importance such that mitigation may be warranted regardless of their assessed NRHP significance. Staff evaluates any known resources located within or adjacent to the project APE to determine whether they meet these eligibility criteria.

A resource is considered to be “historically significant” and eligible for listing in the California Register of Historical Resources if it meets one of the following criteria:

1. It is associated with events that have made a significant contribution to the broad patterns of California’s history and cultural heritage;
2. It is associated with the lives of persons important in our past;
3. It embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values;
4. It has yielded, or may be likely to yield, information important in prehistory or history [California Code of Regulations, Title 14, Section 15064.5(a)(3)].

The CEQA guidelines require the lead agency (in this case, the Energy Commission) to make a determination of whether a proposed project will affect “historical resources” and sets forth a listing of criteria for making this determination. As used in CEQA, the term “historical resources” includes any resource, regardless of age, as long as it meets these any of these criteria. If the criteria are met, the Energy Commission must evaluate whether the project will cause a substantial adverse change in the significance of that historical resource, which the regulations define as a significant effect on the environment. California Code Regulations, Title 14, Section 15064.5 offers the following guidance:

- A resource listed in, or determined to be eligible by, the State Historical Resources Commission, for listing in the California Register of Historical Resources (Pub. Res. Code Section 5024.1, Title 14 CCR, § 4850 et seq.);
- A resource included in a local register of historical resources, as defined in Section 5020.1(k) of the Public Resources Code or identified as significant in an historical resource survey meeting the requirements Section 5024.1(g) of the Public Resources Code, shall be presumed to be historically or culturally significant. Public agencies must treat any such resource as significant unless the preponderance of evidence demonstrates that it is not historically or culturally significant; or
- Any object, building, structure, site, area, place, record, or manuscript which a lead agency determines to be historically significant or significant in the architectural, engineering, science, economic, agricultural, educational, social, political, military or cultural annals of California may be considered to be an historical resource, provided the lead agency’s determination is supported by substantial evidence in light of the whole record.

If the criteria are met, the Energy Commission must evaluate whether the project will cause a substantial adverse change in the significance of that historical resource, which the regulations define as a significant effect on the environment.

Using the above criteria, staff has determined that the cultural resource sites described in the AFC meet one or more of the criteria for being an historical resource.

CEQA establishes limitations on applicants' costs of mitigation for, and does not require discussion of, archeological resources that are not unique (Public Res. Code, § 21083.2). The statute also provides a definition of unique archeological resources. However, the CEQA Guidelines state that this prohibition does not apply when an archeological resource also meets the definition of an historical resource (California Code of Regulations, Title 14, § 15064.5). Because staff has determined that the impacts for which it is recommending mitigation do meet the definition of historical resources, the prohibition does not apply to the mitigation discussed in this Final Staff Assessment.

CUMULATIVE IMPACTS

The potential for cumulative impacts may be associated with the degree of prehistoric and historic sensitivity. The ESPR site would be located in an area where both historic properties and archaeological sites have previously been identified. Most of the area proposed for use by ESPR has already been disturbed by development. Therefore, cumulative impacts are not an issue at this time.

Proposed developments such as the ESPR power plant and its associated linear facilities in conjunction with other development projects would not alter the amount of land currently exposed to public access and/or the potential removal or damage to cultural resources. The combined effects of development may accelerate the potential for impacts to cultural resources, but not in this case.

IMPACTS OF FACILITY CLOSURE

The anticipated lifetime of the El Segundo Power Redevelopment project is expected to be thirty years. If the plant is economically viable at the end of thirty years, it may continue to operate. It is anticipated that upgrades or modifications made prior to the facility's closure might extend the life of the plant. Closure would be caused by either (1) a natural or manmade disaster or economic difficulty, or (2) planned, orderly closure that will occur when the plant becomes economically non-competitive (ESPR 2000a, p. 3.11-1).

PLANNED CLOSURE

The anticipated lifetime of the project is expected to be thirty years. If economically feasible, that time might be extended (ESPR 2000a, p. 3.11-1). At the time of closure, all then-applicable LORS and local/regional plans will be identified and the closure plan will address compliance with those LORS and plans. Generally, if no additional ground disturbance occurs during closure activities and all conditions of certification have been met, no impacts to cultural resources would be expected. However, actual potential impacts are more likely to depend upon the final location of project structures in relation

to existing resources, upon the procedures used for the removal of project structures. Since the spatial relationship between the closure and removal of project structures and sensitive resources cannot be determined at this time, no final conclusion can be drawn with respect to the impact of permanent facility closure on cultural resources. However, if closure plans are submitted and approved through the Energy Commission process, and there is compliance with all conditions of certification and LORS, there will be no impacts to cultural resources.

TEMPORARY CLOSURE

According to the AFC, a temporary closure where there is no release of hazardous materials would necessitate the implementation of 24-hour security. A contingency plan for temporary cessation of operation would be implemented that would ensure compliance with all applicable LORS.

UNEXPECTED PERMANENT CLOSURE

If a site were abandoned, impact to cultural resources would be unlikely because there would be no immediate soil disturbances. Over time, depending on the need to disturb the ground to accomplish project closure and facility removal, some disturbance of known and/or previously unknown cultural resources might result.

COMPLIANCE WITH APPLICABLE LORS

Staff's proposed conditions of certification would ensure compliance with applicable LORS.

MITIGATION

For cultural resources, the preferred method of mitigation is for project construction to avoid areas where cultural resources are known to exist, wherever possible. Often, however, avoidance cannot be achieved, and other measures such as surface collection, subsurface testing, and data recovery must be implemented. Mitigation measures are developed to reduce the potential for adverse project impacts on cultural resources to a less than significant level.

APPLICANT'S PROPOSED MITIGATION

As indicated in the AFC, the best mitigation measure is to avoid impacts. At this time, there are no identified adverse impacts to cultural resources. In general, and given the relative sensitivity for this area to yield buried deposits, archaeological monitoring will be required. Basically, this can be accomplished through coordination between the Project Archaeologist and the Project Engineer. Together they can identify the specific areas of concern and schedule adequate coverage by the archaeological monitor.

Prior to initiation of construction, the Cultural Resource Specialist (CRS) and the Project Engineer will familiarize themselves with both historic and prehistoric cultural resources within the general area. To protect cultural resources and to minimize potential impacts, the Project Archaeologist and the Project Engineer must conduct a worker education meeting with Crew Supervisors and inform them of the locations of cultural resources, the nature of their marking on the ground, and their importance. This time can also be

used to explain the reasons to protect resources, including both the importance of their information and their legal protections. Various instructions can be given to the Crew Supervisors addressing parking and driving in marked areas, collecting of artifacts, and reporting of materials when artifacts are encountered. A one or two page summary of monitoring actions, contacts, and personnel also could be distributed.

The following program is recommended:

- Avoidance
- Physical demarcation and Protection
- Crew Education
- Archaeological Monitoring
- Native American Monitoring
- Formal Compliance with CEQA Sections 15064.5 and 15126.4 (ESPR 2000g, p. 33 & 34).

STAFF'S PROPOSED MITIGATION MEASURES

Commission staff concurs with the mitigation measures proposed by the applicant in the associated filings. Staff has adapted the applicant's proposed mitigation measures into a series of conditions of certification, sometimes rewording for clarification and adding time frames and other requirements. Adoption of staff's proposed conditions of certification is expected to reduce the potential for adverse project impacts on cultural resources to a less than significant level.

The proposed mitigation measures would apply to any potential for impacts to sensitive cultural resources in all areas affected by the project. Mitigation measures are derived from good professional practice and they are based on the U.S. Secretary of the Interior's guidelines and incorporate the policies and guidelines of the cities of El Segundo, Manhattan Beach, and Los Angeles. The mitigation measures set forth in the conditions have been applied to previous projects before the Commission and they have proven successful in protecting sensitive cultural resources from construction-related impacts while allowing the timely completion of many projects throughout California.

Monitoring should occur within the proposed plant site and along the various linear alignments associated with all pipelines. No human remains have been identified within the project area. However, should such resources be identified, all requirements of Health and Safety Code, Section 7050.5 and Public Resources Code Sections 5097.98 and 5097.99 will be fulfilled.

In addition, staff recommends that cultural resource monitoring occur at all the staging and parking areas during any ground disturbance. A Native American monitor shall be retained as a member of the cultural resources team to be present during cultural resources monitoring in the vicinity of any previously identified sites or where there is a potential for encountering Native American artifacts.

CONCLUSIONS AND RECOMMENDATION

CONCLUSIONS

There are four previously identified prehistoric sites within one-quarter mile of the project area. The water pipeline route chosen by the applicant will avoid two historic properties and one historic district. These historic properties appear eligible for listing on the CRHR. The presence of these properties and of prehistoric sites in the vicinity of the project warrants caution during ground disturbance.

The presence of these previously identified cultural resources within one-quarter mile indicates that project construction could encounter potentially significant buried cultural resources. Cultural resources monitoring is recommended as a mitigation to protect undiscovered resources from impacts. If the following conditions of certification are properly implemented, the project will comply with applicable laws, ordinances, regulations, and standards, and no significant adverse impacts will occur.

RECOMMENDATION

Staff recommends that the Commission adopt the following proposed conditions of certification, which incorporate the mitigation measures discussed above.

CONDITIONS OF CERTIFICATION

Some of the Conditions of Certification in this section have been changed from the Staff Assessment based on staff's efforts to standardize Conditions of Certification to the extent feasible based on recent experience in the certification and compliance process. These changes do not affect the substance of the requirements in the Condition. Other Conditions have been changed based on stipulated agreements between staff and the applicant. All of the modified Conditions are supported by the analysis outlined in the text above.

CUL-1 Prior to the start of ground disturbance, the project owner shall submit the resume of the proposed Cultural Resources Specialist (CRS), and one alternate CRS, if an alternate is proposed, to the CPM for review and approval. The CRS will be responsible for implementation of all cultural resources conditions of certification. and may obtain qualified cultural resource monitors (CRMs) to monitor as necessary on the project.

The resume for the CRS and alternate, shall include information that demonstrates that the minimum qualifications specified in the U.S. Secretary of Interior Guidelines, as published by the CFR 36, CFR Part 61 are met. In addition, the CRS shall have the following qualifications:

- a. The technical specialty of the CRS shall be appropriate to the needs of the project and shall include, a background in anthropology, archaeology, history, architectural history or a related field;
- b. At least three years of archaeological or historic, as appropriate, resource mitigation and field experience in California; and

The resume shall include the names and phone numbers of contacts familiar with the work of the CRS on referenced projects and demonstrate that the CRS has the appropriate education and experience to accomplish the cultural resource tasks that must be addressed during ground disturbance, grading, construction and operation. In lieu of the above requirements, the resume shall demonstrate to the satisfaction of the CPM, that the proposed CRS or alternate has the appropriate training and background to effectively implement the conditions of certification.

CRMs shall meet the following qualifications:

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

The project owner shall ensure that the CRS completes any monitoring, mitigation and curation activities necessary; fulfills all the requirements of these conditions of certification; ensures that the CRS obtains technical specialists, and CRMs, if needed; and that the CRS evaluates any cultural resources that are newly discovered or that may be affected in an unanticipated manner for eligibility to the California Register of Historic Resources (CRHR).

Verification:

1. The project owner shall submit the resume for the CRS at least 45 days prior to the start of ground disturbance.
2. At least 10 days prior to a termination or release of the CRS, the project owner shall submit the resume of the proposed new CRS.
3. At least 20 days prior to ground disturbance, the CRS shall submit written notification identifying anticipated CRMs for the project stating they meet the minimum qualifications required by this condition. If additional CRMs are needed later, the CRS shall submit written notice one week prior to any new CRMs beginning work.

CUL-2

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

and the CPM for approval. Maps shall identify all areas of the project where ground disturbance is anticipated.

3. If construction of the project will proceed in phases, maps and drawings, not previously submitted, shall be submitted prior to the start of each phase. Written notification identifying the proposed schedule of each project phase shall be provided to the CRS and CPM.
4. At a minimum, the CRS shall consult weekly with the project construction manager to confirm area(s) to be worked during the next week, until ground disturbance is completed.
5. The project owner shall notify the CRS and CPM of any changes to the scheduling of the construction phases.

Verification:

1. The project owner shall submit the subject maps and drawings at least 40 days prior to the start of ground disturbance.
2. If there are changes to any project related footprint, revised maps and drawings shall be provided at least 15 days prior to start of ground disturbance for those changes.
3. If project construction is phased, the project owner shall submit the subject maps and drawings 15 days prior to each phase.
4. A current schedule of anticipated project activity shall be provided to the CRS on a weekly basis during ground disturbance and also provided in each Monthly Compliance Report (MCR).

The project owner shall provide written notice of any changes to scheduling of construction phases within 5 days of identifying the changes. A copy of the current schedule of anticipated project activities shall be submitted in each MCR.

CUL- 3 Prior to the start of ground disturbance, the project owner shall submit the Cultural Resources Monitoring and Mitigation Plan (CRMMP), as prepared by the CRS, to the CPM for approval. The CRMMP shall identify general and specific measures to minimize potential impacts to sensitive cultural resources. Copies of the CRMMP shall reside with the CRS, alternate CRS, each monitor, and the project owner's on-site manager. No ground disturbance shall occur prior to CPM approval of the CRMMP, unless specifically approved by the CPM.

The CRMMP shall include, but not be limited to, the following elements and measures.

1. The following statement shall be added to the Introduction: Any discussion, summary, or paraphrasing of the conditions in this CRMMP is intended as general guidance and as an aid to the user in understanding the conditions and their implementation. If there appears to be a discrepancy between the conditions and the way in which they have been summarized described, or interpreted in the CRMMP, the conditions, as written in the Final Decision, supercede any interpretation of the Conditions in the CRMMP. The cultural resources conditions of certification are attached as an appendix to this CRMMP.

2. A proposed general research design that includes a discussion of research questions and testable hypotheses applicable to the project area. A refined research design will be prepared for any resource where data recovery is required.
3. Specification of the implementation sequence and the estimated time frames needed to accomplish all project-related tasks during ground disturbance, construction, and post-construction analysis phases of the project.
4. Identification of the person(s) expected to perform each of the tasks, their responsibilities; and the reporting relationships between project construction management and the mitigation and monitoring team.
5. A discussion of the inclusion of Native American observers or monitors, the procedures to be used to select them, and their role and responsibilities.
6. A discussion of all avoidance measures such as flagging or fencing, to prohibit or otherwise restrict access to sensitive resource areas that are to be avoided during construction and/or operation, and identification of areas where these measures are to be implemented. The discussion shall address how these measures will be implemented prior to the start of construction and how long they will be needed to protect the resources from project-related effects.
7. A discussion of the requirement that all cultural resources encountered will be recorded on a DPR form 523 and mapped (may include photos). In addition, all archaeological materials collected as a result of the archaeological investigations (survey, testing, data recovery) shall be curated in accordance with The State Historical Resources Commission's "Guidelines for the Curation of Archaeological Collections," into a retrievable storage collection in a public repository or museum. The public repository or museum must meet the standards and requirements for the curation of cultural resources set forth at Title 36 of the Federal Code of Regulations, Part 79.
8. A discussion of any requirements, specifications, or funding needed for curation of the materials to be delivered for curation and how requirements, specifications and funding will be met. The name and phone number of the contact person at the institution. Include a statement in the discussion of requirements that the project owner will pay all curation fees and that any agreements concerning curation will be retained and available for audit for the life of the project.
9. A discussion of the availability and the designated specialist's access to equipment and supplies necessary for site mapping, photographing, and recovering any cultural resource materials encountered during construction.
10. A discussion of the proposed Cultural Resource Report (CRR) which shall be prepared according to Archaeological Resource Management Report (ARMR) Guidelines.

Verification: The project owner shall submit the subject CRMMP at least 30 days prior to the start of ground disturbance. Per ARMAR Guidelines the author's name shall appear on the title page of the CRMMP. Ground disturbance activities may not

commence until the CRMMP is approved. At least 30 days prior to ground disturbance, a letter shall be provided to the CPM indicating that the project owner will pay curation fees for any materials collected as a result of the archaeological investigations (survey, testing, data recovery).

CUL-4 The project owner shall submit the Cultural Resources Report (CRR) to the CPM for approval. The CRR shall report on all field activities including dates, times and locations, findings, samplings and analysis. All survey reports, DPR 523 forms and additional research reports not previously submitted to the California Historic Resource Information System (CHRIS) shall be included as an appendix to the CRR.

Verification: The project owner shall submit the subject CRR within 90 days after completion of ground disturbance (including landscaping). Within 10 days after CPM approval, the project owner shall provide documentation to the CPM that copies of the CRR have been provided to the curating institution (if archaeological materials were collected), the State Historic Preservation Officer (SHPO) and the CHRIS.

CUL-5 Worker Environmental Awareness Program (WEAP) shall be provided, on a weekly basis, to all new employees starting prior to and for the duration of, ground disturbance. The training may be presented in the form of a video. The training shall include:

1. A discussion of applicable laws and penalties under the law;
2. Samples or visuals of artifacts that might be found in the project vicinity;
3. Information that the CRS, alternate CRS, and CRMs have the authority to halt construction to the degree necessary, as determined by the CRS, in the event of a discovery or unanticipated impact to a cultural resource;
4. Instruction that employees are to halt work on their own in the vicinity of a potential cultural resources find, and shall contact their supervisor and the CRS or CRM; redirection of work will be determined by the construction supervisor and the CRS.
5. An informational brochure that identifies reporting procedures in the event of a discovery;
6. An acknowledgement form signed by each worker indicating that they have received the training; and
7. A sticker that shall be placed on hard hats indicating that environmental training has been completed.

Verification: The project owner shall provide in the Monthly Compliance Report the WEAP Certification of Completion form of persons who have completed the training in the prior month and a running total of all persons who have completed training to date.

CUL-6

1. The CRS, alternate CRS, or monitors shall monitor ground disturbance full time in the vicinity of the project site, linears and ground disturbance at laydown areas or other ancillary areas to ensure there are no impacts to undiscovered resources and to ensure that known resources are not impacted in an

unanticipated manner. In the event that the CRS determines that full-time monitoring is not necessary in certain locations, a letter or email providing a detailed justification for the decision to reduce the level of monitoring shall be provided to the CPM for review and approval prior to any reduction in monitoring.

2. CRMs shall keep a daily log of any monitoring or cultural resource activities and the CRS shall prepare a weekly summary report on the progress or status of cultural resources-related activities. The CRS may informally discuss cultural resource monitoring and mitigation activities with Energy Commission technical staff.
3. The CRS shall notify the project owner and the CPM, by telephone or e-mail, of any incidents of non-compliance with any cultural resources conditions of certification within 24hrs. of becoming aware of the situation. The CRS shall also recommend corrective action to resolve the problem or achieve compliance with the conditions of certification.

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

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

Verification:

1. During the ground disturbance phases of the project, if the CRS wishes to reduce the level of monitoring occurring at the project, a letter identifying the area(s) where the CRS recommends the reduction and justifying the reductions in monitoring shall be submitted to the CPM for review and approval.
2. During the ground disturbance phases of the project, the project owner shall include in the MCR to the CPM copies of the weekly summary reports prepared by the CRS regarding project-related cultural resources monitoring. Copies of daily logs shall be retained on-site and made available for audit by the CPM.
3. Within 24 hours of recognition of a non-compliance issue, the CRS shall notify the CPM by telephone of the problem and of steps being taken to resolve the problem. The telephone call shall be followed by an e-mail or fax detailing the non-compliance issue and the measures necessary to achieve resolution of the issue. Daily logs shall include forms detailing any instances of non-compliance with conditions of certification. In the event of a non-compliance issue, a report written no sooner than two weeks after resolution of the issue that describes the issue, resolution of the issue and the effectiveness or the resolution measures, shall be provided in the next MCR.

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

CUL-7 The CRS, alternate CRS and the CRMs shall have the authority to halt construction if previously unknown cultural resource sites or materials are encountered, or if known resources may be impacted in a previously unanticipated manner. Redirection of ground disturbance shall be accomplished under the direction of the construction supervisor.

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

1. the CRS has notified the project owner, and the CPM has been notified within 24 hours of the find description and the work stoppage.;
2. The CRS, the project owner, and the CPM have conferred and determined what, if any, data recovery or other mitigation is needed;
3. Any necessary data recovery and mitigation has been completed

Verification: At least 30 days prior to the start of ground disturbance, the project owner shall provide the CPM with a letter confirming that the CRS, alternate CRS and CRMs have the authority to halt construction activities in the vicinity of a cultural resource find, and that the CRS or project owner will notify the CPM immediately (no later than the following morning of the incident or Monday morning in the case of a weekend) of any halt of construction activities, including the circumstance and proposed mitigation measures. The project owner shall provide the CRS with a copy of the letter granting the authority to halt.

CUL-8 Within the water pipeline study area, bordered by El Segundo Blvd., Loma Vista St., Grand Ave. and Eucalyptus St., the route for the water lines shall extend down Grand Avenue to Eucalyptus St. to El Segundo Blvd. (Applicant has conducted a cultural resources assessment in the pipeline study area and within the area defined as the proposed project). Apart from this route within the pipeline study area, if the water lines and associated pipelines are to be located anywhere but in an area originally defined as part of the proposed project, a cultural resource assessment shall be conducted prior to any ground disturbance. The cultural resource assessment shall consist of a records search and a pedestrian survey which gives equal emphasis to prehistoric and historic resources and an evaluation of significance. A Native American monitor from a group with historic ties to the affected area shall be retained as part of the cultural resources team during any surveys or subsurface investigation.

Verification: Forty days prior to the start of any ground disturbance or project site preparation at the newly identified location of the waterlines and associated pipelines, the project owner shall submit the following for approval by the CPM: (1) the results of the records search and the results of the survey; (2) an evaluation, including site records, of all cultural resources within or adjacent to the project Area of Potential

Effects; and (3) the information shall also include the name and tribal affiliation of the Native American monitor.

REFERENCES

ESPR (El Segundo Power Station) 2000a – Application for Certification Submitted to the California Energy Commission on December 18, 2000.

ESPR (El Segundo Power Station) 2000g – Cultural Resources – Section 5.7 and Appendix J Submitted to California Energy Commission on January 9, 2001.

ESPR (El Segundo Power Station) – 2000q – Five (5) Sets of the historic report: Buildings Near the Proposed Water Mains POS Submitted to the California Energy Commission on April 20, 2001.

ESPR (El Segundo Power Station)-2000v-Draft Stormwater Pollution Prevention (SWPPP) for Construction Activities and Engineering drawings of the ESGS retention basin, in response to Soil and Water Data Request No. 140. POS

Mason, Roger D. and Mark L. Peterson (1994)
Chronological Sequence. Newport Coast Archaeological Investigations. On file, California State University, Fullerton, South Central Coastal Information Center, Fullerton, California.

McCawley, William (1996)
The First Angelinos: The Gabrielino Indians of Los Angeles. The Malki Museum Press and Ballena Press, Banning, California.

HAZARDOUS MATERIALS MANAGEMENT

Testimony of Ramesh Sundareswaran

INTRODUCTION

The purpose of this analysis is to determine if the proposed El Segundo Power Redevelopment (ESPR) project will result in the potential for a significant impact on the public resulting from the use, handling or storage of hazardous materials at the proposed facility. If significant adverse impacts on the public are identified, Energy Commission staff must also evaluate the potential for facility design alternatives and additional mitigation measures to reduce impacts to the extent feasible.

This analysis does not address potential exposure of workers to hazardous materials used at the proposed facility. Employers must inform employees of hazards associated with their work and thus employees, in exchange for compensation, accept a higher level of risk than would be acceptable for general public exposure. Workers are therefore not afforded the same level of protection normally provided to the public. Further, workers can be provided with special protective equipment and training to reduce the potential for health impacts associated with the handling of hazardous materials (see staff's **WORKER SAFETY AND FIRE PROTECTION** section).

According to available information furnished by the applicant, a variety of hazardous materials are proposed for storage and use during the construction phase of the project and for routine plant operation and maintenance (O&M) following construction (ESPR 2000a). Gasoline, diesel, fuel oil, lubricants, solvents, adhesives, paint materials and welding gases are listed for use during construction. The O&M materials include but are not limited to aqueous ammonia, lubricating oils, sodium hypochlorite, hydrazine, hydrochloric acid, various gases and piped-in natural gas. The transportation and delivery of hazardous materials is routinely regulated and controlled by various federal and state laws, ordinances, regulations and standards. Analysis for the potential for impact associated with hazardous materials deliveries is addressed in staff's **TRAFFIC AND TRANSPORTATION** section.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS

A framework, based on environmental laws, ordinances, regulations and standards (LORS), exists to reduce risks of accidents and routine hazards due to hazardous materials. The following generally apply to the protection of public health and hazardous materials management. Staff's analysis examines the project's compliance with these requirements.

FEDERAL

The Superfund Amendments and Reauthorization Act of 1986 (SARA) Title III, section 301 and Clean Air Act, section 112 established a nationwide emergency planning and response program and imposed reporting requirements for businesses which store, handle, or produce significant quantities of extremely hazardous materials. The requirements of the Federal law are reflected in the California Health and Safety Code,

section 25531 et seq. The rules include requirements for businesses to develop and implement risk management programs that incorporate three elements: a hazard assessment, a prevention program and an emergency response program. These are collectively commonly referred to as the US Environmental Protection Agency Risk Management Program (USEPA RMP).

STATE

Title 19, Chapter 4.5 of the California Code of Regulations, which implements the provisions of California Health and Safety Code, section 25500 et seq., directs facility owners that store or handle acutely hazardous materials in threshold quantities to develop a Risk Management Plan (RMP) and submit it to appropriate local authorities, the US EPA, and the designated local Administering Agency for review and approval. The plan must include an evaluation of the potential impacts associated with an accidental release, the likelihood of an accidental release occurring, the magnitude of potential human exposure, any preexisting evaluations or studies of the material, the likelihood of the substance being handled in the manner indicated, and the accident history of the material. This new, recently developed program supersedes the California Risk Management and Prevention Plan (RMPP) and is called the California Accidental Release Prevention Program (CalARP). The City of El Segundo Fire Department is designated as the local implementing agency under this program.

Title 8, California Code of Regulations, section 5189, requires facility owners to develop and implement effective safety management plans to insure that large quantities of hazardous materials are handled safely. While such requirements primarily provide for the protection of workers, they also indirectly improve public safety and are coordinated with the RMP process. The program is called the California Occupational Safety & Health (Cal/OSHA) Process Safety Management (PSM).

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

LOCAL AND REGIONAL

The Uniform Fire Code (UFC) contains provisions regarding the storage and handling of hazardous materials. These provisions are contained in Articles 79 and 80. The latest revision to Article 80 was in 1997 (UFC 1997).

The California Building Code contains requirements regarding the storage and handling of hazardous materials. The Chief Building Official must inspect and verify compliance with these requirements prior to issuance of an occupancy permit. A further discussion of these requirements is provided in the **FACILITY DESIGN** section of this document.

Various ordinances of the City of El Segundo contain provisions for the designation and disclosure of hazardous materials. These include and are not limited to ordinances 1088, 1264, 1280 and 1285.

SETTING

SITE AND VICINITY DESCRIPTION

The ESPR project will be located at the existing El Segundo Generating Station (ESGS) situated at 301 Vista Del Mar in the City of El Segundo. The ESPR project includes the demolition of existing power blocks of Units 1 and 2 and construction operation of a combined cycle power plant at the former locations of Units 1 and 2. The ESGS was built in 1955 and is located in a heavy industrial zone. Land use in the surrounding areas is predominantly industrial to the north, residential and commercial to the south, recreational to the west and industrial and public thoroughfare to the east. The nearest sensitive receptor is a school located more than 0.5 miles northeast of the ESGS. The closest residence is located approximately 100 feet to the south of the ESGS.

IMPACTS

Staff has identified three major types of hazards associated with the ESPR project. These include the accidental release of ammonia, hydrazine vapor mishandling and fire and explosion from natural gas.

Aqueous AMMONIA

The ESPR project will utilize Selective Catalytic Reduction (SCR) to reduce combustion generated nitrogen oxide (NO_x) emissions to comply with air permit requirements. Aqueous ammonia (29% ammonia and 71% water) will be used as a reactant within a catalyst to knock down the NO_x to water vapor and nitrogen. The ammonia will be stored in a 20,000 gallon capacity double walled underground storage tank which is equipped with leak detectors, pressure relief valves and gauges for temperature and pressure. Deliveries of aqueous ammonia will be facilitated through a proposed pipeline from the neighboring Chevron facility. The pipeline will be designed and built in accordance with current engineering standards and requirements. The bulk of the pipeline will be aboveground with about 15 percent being located underground during its routing under Vista del Mar. The underground sections of the pipeline will be engineered to minimize corrosion effects. Valves and other measures will be utilized on the entire pipeline to prevent releases of ammonia. The ammonia will be trucked in should the pipeline be down for any reason.

Large accidental and continuous releases of ammonia culminating in potentially catastrophic outcomes to the public are possible through three main potential accident initiators for the ESPR project. One of the initiating events is the failure of the underground storage tank. The other two are the failures of the operating pipeline and that of the tanker truck during delivery respectively. To assess the potential impacts associated with an accidental release of ammonia, staff typically evaluates where four "bench mark" exposure levels of ammonia gas occur off-site in parts per million (PPM). These include: 1) the lowest concentration posing a risk of lethality, 2,000 PPM; 2) the Immediately Dangerous to Life and Health level (IDLH) of 300 PPM; 3) the Emergency Response Planning Guideline (ERPG) level 2 of 150 PPM (recently changed from 200 PPM), which is also the RMP level 1 criterion used by EPA and California; and 4) the level considered by the Energy Commission staff to be without serious adverse effects

on the public for a one-time exposure of 75 PPM. If the exposure associated with a potential release would exceed 75 PPM at any public receptor, staff will presume that the potential release poses a risk of significant impact. However, staff may also assess the probability of occurrence of the release and/or the nature of the potentially exposed population. Staff may, based on such analysis, determine that the likelihood and extent of potential exposure are not sufficient to support a finding of potentially significant impact.

The ammonia underground storage tank is double walled with pressure relief valves and overlain by soil overburden. High operating pressures would not be used to store the aqueous ammonia in the tank. Consequently, any rupture or puncture of the tank would not be capable of blowing away the soil overburden resulting in large releases of ammonia. Instead, in the event of a release, the ammonia would enter the surrounding atmosphere with very little momentum and velocity. Risks to the public from such an accident would therefore be minimally low.

The other two ammonia accident scenarios were modeled and evaluated by the applicant. The modeling was done in accordance with USEPA RMP and CalARP requirements. The modeling reflects a unique combination of wind direction speed, and atmospheric stability conditions. A 75-ppm impact area with a radius of approximately 1060 feet (0.2 miles) was determined for the pipeline release scenario and an impact area with a radius of approximately 2450 feet (0.5 miles) was forecast for the tanker truck scenario. Sections of Vista Del Mar and the public beach to the northeast fall within the 1060 feet impact area. The tanker truck scenario's impact area extends to some of the residences to the south and portions of the Vista Del Mar and the public beach. The applicant conducted a risk analysis to estimate the potentials for both scenarios. The analysis suggests that there is a chance of 0.0000063 of an accident involving an ammonia release due to a major release from the ammonia pipeline in any particular year. Similarly, the probability of a major ammonia release due to a tanker truck unloading accident is 0.000038 on an annual basis. It is assumed that the ammonia release stems from the failure of a hose due to operator error during the unloading/delivery.

Both scenarios appear rather remote for the following reasons. A worst case approach has been used for both scenarios. In a worst case environment, the greatest possible amount of the chemical is assumed to be released from a storage vessel or piping in a fast, rapid motion at the ground level. Active mitigation devices that need mechanical, human or other energy to manage releases must be assumed to have failed. Further, the weather conditions are assumed to be unique and mild. The ammonia modeling for the ESPR project is therefore not only conservative but also pessimistic thereby culminating in outcomes that are overstated.

The USEPA RMP, CalARP and Cal/OSHA PSM programs each individually list threshold-planning quantities for specific hazardous materials. Only materials that met certain toxicological, physical and accident criteria were identified and listed. If the quantity of a material on-site exceeds the threshold amount, the facility needs to implement chemical accident prevention and preparedness measures that may include a Risk Management Plan (RMP), pursuant to each regulation. The RMP is a detailed engineering analysis of the potential accident factors at a business and the mitigation

measures that can be implemented to reduce accident potentials. Of the listed materials for the ESPR project, aqueous ammonia will need to be managed in accordance with the requirements of the CalARP and USEPA RMP Programs, as the maximum amount of that chemical will be above each respective program's threshold. The ESGS site currently has chemical accident prevention and preparedness safeguards as required by CalARP and USEPA RMP programs, in place based on its consumption of aqueous ammonia, hydrogen, hydrochloric acid, cyclohexylamine and sulfuric acid. The ESPR project however necessitates an increase in the consumption of aqueous ammonia, thereby prompting a revision of the existing safeguards and procedures to reflect that change pursuant to each applicable program. In addition, the current RMP for the ESGS will need to be revised and upgraded to reflect the increased ammonia usage.

Those safety and hazard prevention practices that are already in place at the ESGS would further be incorporated into the ESPR project. The Applicant has indicated that they have safety systems that add several layers of protection and defense between hazardous materials and the public as part of accident prevention. These include but are not limited to use of written plans and procedures for hazardous materials management, fire extinguishing and spill response equipment for emergencies and training programs for plant personnel in hazardous materials handling.

The slight chance or very low probability of occurrence of each individual scenario, as estimated, suggests that it is unlikely that such accidents would occur.

Additional safeguards and measures, as recommended in Conditions of Certification **HAZ-1** through **HAZ-4**, should supplement existing ones to greatly reduce the opportunity for, or extent of, public exposure to ammonia.

Hydrazine

Hydrazine will be stored and used onsite for the ESPR project as an oxygen scavenger in boiler water treatment. Its formulation will consist of 35 percent hydrazine and 65 percent water culminating in an approximate 4:1 solution of hydrazine in water.

Unlike ammonia, which is only toxic, hydrazine is also corrosive and flammable in addition to being toxic. Though it will be stored and used in amounts less than the CalARP thresholds, hydrazine requires special storage and handling in order to avoid or minimize impacts from accidental release, given hydrazine's unique characteristics. The applicant has indicated that passive mitigation in the form of secondary containment will be available to control any hydrazine release in the storage area. This is important, as the containment would reduce the size of the pooled hydrazine thereby resulting in a smaller vapor cloud. However, additional precautions for hydrazine storage and handling, as outlined in the Conditions of Certification **HAZ-4**, need to be considered in addition to those proposed by the applicant in order to prudently reduce or eliminate any potential risks posed by hydrazine.

Alternatively, less hazardous and benign substitutes to hydrazine are available commercially. Use of these substitutes will virtually eliminate all potential risks associated with hydrazine. The applicant has indicated that a feasibility study will be

undertaken, during the project's detailed design phase, to evaluate substitution of hydrazine with a less hazardous alternative.

Natural Gas

Natural gas, which will be used as a fuel by the ESPR project, poses a fire and/or explosion risk as a result of its flammability. While natural gas will be used in significant quantities, it will not be stored on site. No changes are expected to be needed to the existing piping network for the ESPR project. The risk of a fire and/or explosion from natural gas can be reduced to insignificant levels through adherence to applicable codes and the development and implementation of effective safety management practices.

CUMULATIVE IMPACTS

Activities related to hazardous materials at the ESPR project are regulated by existing laws and regulations to prevent unacceptable off-site risks to the public. Additional mitigation measures have been proposed to reduce any potential impacts to the ESPR project to less-than-significant levels. Other projects causing related impacts are not anticipated in the ESPR vicinity. No cumulative impacts are therefore expected in combination with the ESPR project.

FACILITY CLOSURE

The requirements for handling of hazardous materials remain in effect until such materials are removed from the site regardless of facility closure. Therefore, the facility owners are responsible for continuing to handle such materials in a safe manner, as required by applicable laws. In the event that the facility owner abandons the facility in a manner which poses a risk to surrounding populations, staff will coordinate with the California Office of Emergency Services, City of El Segundo Fire Department and the California Department of Toxic Substances Control (DTSC) to ensure that any unacceptable risk to the public is eliminated. Funding for such emergency action can be provided by federal, state or local agencies until the cost can be recovered from the responsible parties (O.E.S. 1990).

ENVIRONMENTAL JUSTICE

Staff has reviewed Census 2000 information that identifies a minority population greater than 50 percent within a six-mile radius of the proposed ESPR project (see **Socioeconomics**). All potential impacts that were identified in the analysis do not present any unacceptable off-site health risks to the public.

Based on the aforementioned analysis, staff has not identified unmitigated significant direct or cumulative impacts resulting from the construction or operation of the project and, therefore, there are no hazardous materials management related environmental justice issues related to the ESPR project.

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSION

Staff has determined that compliance with applicable LORS, proposed and existing safeguards, and additional conditions outlined below should greatly reduce the opportunity for, or extent of, exposure to hazardous materials for the public. With adoption of the measures proposed by the applicant and additional measures included in staff's proposed Conditions of Certification, staff concludes that the risks from hazardous materials release are less than significant.

RECOMMENDATION

Should the Energy Commission approve this project, staff recommends that the following conditions of certification be adopted to ensure that the project is designed, constructed and operated to comply with applicable LORS, and to protect the public from any potential significant adverse impacts.

PROPOSED CONDITIONS OF CERTIFICATION

Some of the Conditions of Certification in this section have been changed from the PSA based on staff's efforts to standardize Conditions of Certification to the extent feasible based on recent experience in the certification and compliance process. These changes do not affect the substance of the requirements in the Condition. Other Conditions have been changed based on stipulated agreements between staff and the applicant. All of the modified Conditions are supported by the analysis outlined in the text above.

HAZ-1 The project owner shall obtain the advance approval of the CPM if the facility intends to store, handle, use or move (or combination of these activities) a material, in quantities that exceed those specified in Title 40, CFR Part 355, Subpart J section 355.50 or in greater quantities than those identified by chemical name in the revised Table 5.15-2 (revised as of June 7, 2001) in the AFC, unless approved in advance by the CPM.

Verification: The project owner shall provide to the CPM, in the Annual Compliance Report, a list of those hazardous materials designated as regulated substances as set forth in Title 40, CFR Part 355, Subpart J section 355.50. The list shall also include maximum quantities of these substances at the facility. Copies of the list should also be provided to the City of El Segundo Fire Department (CESFD) and the City of Manhattan Beach Fire Department (CMBFD).

HAZ-2 The project owner shall update its existing Business Plan.

Verification: At least 45 days prior to the startup of the ESPR project Units 5, 6 and 7, the owner shall undertake a hazardous materials floor plan exercise with the CESFD and provide a copy of the revised Business Plan, commented on by the CESFD, to the CPM. A copy of the revised Plan shall also be provided to the CMBFD.

HAZ-3 The project owner shall revise the existing CalARP Program Risk Management Plan (RMP). Similarly, the project owner shall also revise its existing RMP pursuant to the USEPA RMP Program. Both RMPs shall be expanded to include discussions to prevent and control the accidental release of ammonia from the pipeline. Those discussions shall elaborate on the various safety devices selected for the pipeline including double sleeve construction, provisions for backup safety devices, protective shut-in actions, emergency support systems, monitoring programs and personnel training, as a minimum. The shut-in actions shall include responses to pipeline overpressures and also leaks.

Verification: At least 45 days prior to startup of Units 5, 6, and 7, the project owner shall furnish a final copy of each updated RMP to the CPM, CESFD and CMBFD. An initial draft of the CalARP RMP shall be provided to the CPM and the CESFD for review and comments. The final CalARP RMP shall be approved by the CPM. Similarly, an initial draft of the USEPA RMP shall be provided to the CPM and the CESFD for review and comments, at the time it is submitted to the USEPA for review. The final copy of the USEPA RMP shall reflect recommendations of the CPM and the CESFD.

HAZ-4 The project owner shall undertake a feasibility study for the substitution of the 35% hydrazine with a less hazardous chemical. Should the study conclude that substitution is infeasible and the project owner elects to continue the use of the 35% hydrazine, then the project owner shall develop and prepare a safety management plan focussing on the storage and handling of the hydrazine and the associated protective equipment requirements, handling techniques, personnel training, spill response procedures, detectors and alarms, as a minimum.

Verification: At least 45 days prior to startup of Units 5, 6, and 7, the project owner shall furnish a final copy of either the feasibility study or the hydrazine storage and handling management plan, as appropriate, to the CPM, CESFD and CMBFD. All initial drafts shall be reviewed and commented upon by the CPM and CESFD. All final copies shall be approved by the CPM.

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LAND USE

Testimony of Mark Hamblin

INTRODUCTION

The El Segundo Power Redevelopment Project (“ESPR” or “project”) involves the replacement or modernization of the existing 350 megawatt (MW) Units 1 and 2 at the existing El Segundo Generating Station (ESGS) with a 630 MW combined cycle power generating facility. El Segundo Power II LLC (herein referenced as “applicant”) proposes the project located within the City of El Segundo (City), County of Los Angeles, California.

Refer to **PROJECT DESCRIPTION** of this Final Staff Assessment (FSA) for a more detailed discussion of the modernization activities.

The land use analysis for the ESPR focuses on two main issues: the project’s consistency with land use plans, ordinances and policies; and the project’s compatibility with existing and planned land uses. In general, an electric generation project and its related facilities would be incompatible with existing and planned uses when it creates unmitigated noise, dust, public health hazard, nuisance, traffic, visual impacts. These areas are discussed in detail in their sections of this FSA.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

This section describes federal, state, regional, and local land use laws, ordinances, regulations, and standards (LORS) applicable to the proposed project.

FEDERAL

Federal Aviation Regulations (Code of Federal Regulations, Part 77)

The Federal Aviation Regulations (FAR) provide regulations and requirements for insuring the safe, efficient, and secure use of the Nation's airspace, by military as well as civil aviation, for promoting safety in air commerce, for encouraging and developing civil aeronautics, including new aviation technology, and for supporting the requirements of national defense. These regulations are designed to promote the safety of airport operations within the vicinity of an airport by defining a clear zone above which structures are seldom permitted to penetrate.

STATE

California Coastal Act (Pub. Resources Code §30000 Et Seq.)

The California Coastal Act establishes a comprehensive scheme to govern land use planning along the entire California coast (Pub. Resources Code, §30000 et seq.). The Coastal Act sets forth general policies that govern the California Coastal Commission’s review of permit applications and local plans (Pub. Resources Code, §30200 et seq.). The following sections of the Act are relevant to energy facilities:

Consistency and Suitability Report

Section 30413 of the Coastal Act requires the Coastal Commission to prepare a consistency and suitability report to the Energy Commission on any new power generating facility proposed to be located within the designated Coastal Zone (Pub. Resources Code §30413). The consistency and suitability report includes findings on the “conformance of the proposed site and related facilities with the certified coastal programs in those jurisdictions which would be affected by any such development [and] the degree to which the proposed site and related facilities could reasonably be modified so as to mitigate potential adverse effects on coastal resources, minimize conflict with existing or planned coastal-dependent uses at or near the site, and promote the policies of this division.” (Pub. Resources Code §30413 (d)(5) and (d)(6)).

The Coastal Commission has the lead responsibility for determining a power plant’s consistency and suitability with the Coastal Act. Under the Warren-Alquist Act, the Energy Commission must include in its decision the provisions recommended by the Coastal Commission in its section 30413 report unless the Energy Commission determines that adoption of these provisions would result in a greater adverse effect on the environment or that the provisions would not be feasible for the project (Pub. Resources Code, §25523(b)).

Use of Existing Power Plant Sites

Section of 30260 encourages the use of existing coastal-dependent industrial sites within the Coastal Zone instead of using undeveloped areas of the Coastal Zone.

Coastal Access

Section 30211 of the Coastal Act requires that new development not interfere with the public’s right of access to the shoreline, where the access has been previously acquired by a federal, state, or local government authorization.

Coastal Dependent Use

Section 30101 defines a “Coastal-dependent development or use” as the following:

“Coastal-dependent development or use” means any development or use which requires a site on, or adjacent to, the sea to be able to function at all.”

In accordance with the California Coastal Act, the City of El Segundo Local Coastal Program, and the City of El Segundo’s Council Resolution No. 3005, the primary industrial land uses in the Coastal Zone are to be coastal dependent uses as defined by the Coastal Act.

Warren-Alquist Act (Pub. Resources Code § 25500 et seq.)

Since the applicant is altering, replacing and improving equipment that will result in the facility having an increased generating capability of greater than 50MW, the applicant was required to file for a license from the California Energy Commission. The total increase in the generating capacity of the new facility over the old facility is 280 MW.

Area For Public Use

Pursuant to §25529 of the Warren-Alquist Act, the Energy Commission shall require that area be established for public use as a condition of certification of a facility being proposed in the Coastal Zone. The applicant has the option of maintaining the public use area or dedicating it to any State or local agency agreeing to maintain it for the benefit of the public.

Ungranted State Tidelands and Submerged Lands Leasing (Pub. Resources Code § 6701-6706)

The California State Lands Commission (SLC) has exclusive jurisdiction over all ungranted tidelands and submerged lands owned by the State (Pub. Resources Code, sections 6216 and 6301). The State Lands Act of 1938, resulted in the California State Legislature vesting in the State Lands Commission the authority to administer, sell, lease or dispose of the public lands owned by the State or under its control, including not only school lands but tidelands, submerged lands, swamp and overflowed lands and beds of navigable rivers and lakes. The commission is also authorized to provide for the extraction of minerals and oil and gas from state owned and controlled lands.

Any person who uses or occupies any lands owned or controlled by the State under the jurisdiction of the State Lands Commission is required to obtain a lease, permit or other agreement and provide payment for rent.

Subdivision Map Act (Pub. Resources Code § 66410-66499.58)

The Subdivision Map Act provides procedures and requirements regulating land divisions (subdivisions) and the determination of parcel legality. Regulation and control of the design and improvement of subdivisions, by this Act, has been vested in the legislative bodies of local government. A designated local government agency, by ordinance, regulates and controls the initial design and improvement of common interest developments and subdivisions for which the Map Act requires a tentative and final map.

LOCAL

The ESPR will affect three local jurisdictions: 1) the City of El Segundo, 2) the City of Manhattan Beach and 3) the City of Los Angeles and its Playa Del Rey community.

El Segundo General Plan

The City of El Segundo General Plan was updated in 1992. It contains an evaluation of existing conditions and provides long-term goals and policies necessary to guide development in the direction of fulfilling the city's vision for the future.

El Segundo Local Coastal Program

The City of El Segundo Local Coastal Program (LCP) was adopted in July, 1980, and certified by the Coastal Commission in February, 1982. The LCP is El Segundo's land use plan, zoning ordinance, and zoning district map for the Coastal Zone. The Coastal Zone within the City's jurisdiction is defined as a narrow strip of land approximately 200 yards wide and 0.8 miles long, which includes the existing ESGS. In this area, the City of El Segundo certified LCP supercedes the City's General Plan Land Use Element land use designations and policies.

El Segundo Zoning Ordinance

The City of El Segundo Zoning Ordinance provides detailed standards that regulate land uses. These regulations were adopted in 1993 and were last amended in March 1998.

Manhattan Beach General Plan

The City of Manhattan Beach General Plan was adopted in February 1988. The Land Use Element describes the City's policies for the project area that are designed to permit and protect the multi-family uses that exist in the area, as well as commercial uses to the south.

Manhattan Beach Local Coastal Program

The City of Manhattan Beach has an LCP Phase III Implementation Program that was certified by the Coastal Commission on May 24, 1994, and was last amended on October 7, 1997. The LCP describes allowed uses and regulations for the coastal land within the City of Manhattan Beach's jurisdiction.

Manhattan Beach Municipal Code

The City of Manhattan Beach Municipal Code's Zoning Regulations provide detailed regulations that are applicable to land uses proposed in the City. The Zoning Ordinance was adopted in June 1941 and last amended on June 6, 2000.

City of Los Angeles General Plan

The Westchester/Playa Del Rey Community Plan provides the Land Use Element for the Playa Del Rey area of the City of Los Angeles. This document was adopted in 1974 and was last amended in 2001. However, the document does not provide policies applicable for the applicant's proposed installation of water pipelines in the City of Los Angeles's public right-of-way.

City of Los Angeles Municipal Code

The City of Los Angeles zone regulations (City of Los Angeles Municipal Code Section 12.20.) apply to the area where the water pipelines are proposed in the City of Los Angeles. However, the document does not provide regulations related to construction and operation of a water pipeline within the public right-of-way.

SETTING

The ESPR site is located in the City of El Segundo. El Segundo is approximately 20 miles from the Los Angeles downtown area. The project site is approximately 2.5 miles south of Los Angeles International Airport.

The project site is located on approximately 0.8 miles of coastline within the City of El Segundo. The site is bound by a street named Vista Del Mar and a Chevron refinery to the east; Santa Monica Bay beaches to the west, 45th Street in the City of Manhattan Beach to the south and the Chevron Marine Terminal to the north.

A portion of the City of Los Angeles that contains the Scattergood Power Generating Facility, the Hyperion Treatment Plant, Los Angeles International Airport and other

industrial development is located north of the project site. The City of El Segundo is located to the northeast, east and southeast of the project site. Residential uses, open space, and commercial uses are located to the northeast along the proposed water supply line route. Various heavy industrial uses exist east of the project site. The Chevron Refinery lies to the east and southeast of the project site. Residential uses are located south of the project site within the City of Manhattan Beach.

The project site is located on the edge of Santa Monica Bay. Dockweiler State Beach and a Los Angeles County maintained Class 1 bicycle path are located immediately west of the site. Several parking lots to the north and south of the project area provide coastal access.

SITE AND VICINITY DESCRIPTION

Southern California Edison Company constructed the El Segundo Generating Station (ESGS). It has been in operation since 1955. The ESGS currently contains four gas-fired conventional generating units. Two fuel storage tanks are located on the southern portion of the site. A Southern California Edison substation is located adjacent to the project site and is connected to the regional electrical transmission grid. The ESPR site is located in a minor topographic depression west of Vista Del Mar, which is elevated above the power plant. **LAND USE Figure 1** depicts the existing land uses within one mile of the project site.

Existing Uses Surrounding The Site

Residential uses are located to the south of the project site. A retail gas station is located on a one-acre site to the southeast of the project site. Industrial uses are located north of the project site within the City of Los Angeles and east of the project site within the City of El Segundo. Parks and open space are located along the coast west of the project site. There are no agricultural lands within the region.

Linear Facilities – Vicinity Description

As shown in **LAND USE Figure 1**, industrial uses are located along the water pipeline route within the City of Los Angeles along Grand Avenue. Commercial and residential uses front Grand Avenue in the City of El Segundo along the proposed water line route. There are commercial uses along El Segundo Boulevard and Main Street where the pipeline route will run northeast of the project site.

Parks and open space are located to the northeast of the water pipeline area in El Segundo, and south of the sewer line connection in Manhattan Beach.

Residential uses are also located in the City of Manhattan Beach near the proposed sewer line connection, which is south of the proposed project.

A proposed aqueous ammonia pipeline will begin at a junction on the Chevron refinery (located across the street from the ESGS). The pipeline will be routed approximately 0.5 miles and traverse under Vista Del Mar to the north of the ESGS property. The pipeline would pass through an existing pipeline culvert used by the refinery.

INSERT FIGURE 1

IMPACTS

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

- conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project adopted for the purpose of avoiding or mitigating an environmental effect;
- disrupt or divide the physical arrangement of an established community; or
- convert Prime Farmland, Farmland of Statewide Importance, or Unique Farmland to non-agricultural use.

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

CONSISTENCY WITH LAWS, ORDINANCES, REGULATIONS AND STANDARDS

The land use laws, ordinances, regulations, standards (LORS) and policies applicable to the project site (which primarily affects the City of El Segundo) have been analyzed below to determine the extent to which the ESPR project is consistent.

FEDERAL

Federal Aviation Regulations

The proposed project is approximately 2.5 miles south of Los Angeles International Airport (LAX). Karen McDonald, Specialist, Airspace Branch of the FAA completed an aeronautical study of the project as required under FAR Part 77. The study revealed that the structure does not exceed obstruction standards and would not be a hazard to air navigation provided the exhaust stacks are marked and/or lighted in accordance with FAA Advisory Circular 70/7460-1K, Obstruction Marking and Lighting, (see proposed Condition of Certification **LAND-5**). Therefore, the ESPR project is consistent with FAA regulations. Also, see the **TRAFFIC AND TRANSPORTATION** section for additional discussion.

State

CALIFORNIA COASTAL ACT

Project Site

The 33 acre ESGS property is within the Coastal Zone. The City of El Segundo adopted its Local Coastal Program (LCP) on July 1, 1980 (City of El Segundo Resolution No. 3005). The Coastal Commission certified the LCP on February 4, 1982. The El Segundo LCP incorporated several policies of the California Coastal

Act, specifically Chapter 3: Coastal Resources Planning And Management Policies. This chapter includes Public Resources Code section 30264 that pertains to thermal electric generating plants.

The proposed modernization would be located entirely within the ESGS 33-acre property. Consequently, the project is consistent with a portion of the Coastal Act's Section 30260 that prefers onsite expansion of existing power plants to development of new power plants in currently undeveloped areas of the Coastal Zone.

Cooling Water Intake Structures

Currently, cooling water for the ESGS is provided by two separate intakes structures that pull ocean water from Santa Monica Bay. One existing ocean intake serves Units 1 and 2 and another serves Units 3 and 4. The water supply for cooling the proposed ESPR project would originate from Santa Monica Bay through use of Outfall No. 001. Units 3 and 4 would continue to use the second existing sea water intake (Outfall No. 002) to provide cooling water. Since the proposed ESPR and the remaining portions of ESGS would be obtaining cooling water from the sea in order to function, the ESGS would remain consistent with the Coastal-dependent use definition.

Coastal Access

Consistent with the Coastal Act's requirement for maintenance of public access, the proposed project does not interfere with access to the beach. Currently, there is public access to Dockweiler State Beach and Manhattan State Beach. Coastal access is also available by means of a County-maintained Class I bicycle path that runs along the beachfront (westerly) side of the power plant property. The path links other beach access areas located to the north and to the south of the project site.

The City of Manhattan Beach has expressed concern regarding public access to Manhattan State Beach via use of 45th Street and the Strand public parking area due to the construction of the project's sewer pipeline connection. Staff has proposed a Condition of Certification **LAND-6** for the project to address the City's concern.

Availability of Coastal Access Parking

The applicant is considering temporary use of several existing County maintained parking lots for ESPR construction worker parking and laydown area(s). The County parking lots provide access to the State owned beach. This project would temporarily reduce beach access by the general public during construction.

Proposed ESPR parking could occur at Dockweiler State Beach, Hyperion, and Grand Avenue parking lots (ESPR 2000a, AFC Figure 3.2-1). The Los Angeles County Department of Beaches and Harbors operates these parking lots subject to Coastal Commission oversight. The Los Angeles County Department of Beaches and Harbors would review any application by the El Segundo Power Plant operators to use the parking lots for construction parking and would not allow that use to interfere with public access to the beach (Personal communication Mr. Joe Chesler, Los Angeles County Department of Beaches and Harbors).

Construction of the sewer line from the intersection of 45th Street and The Strand to the project site has the potential to limit beach access at the Strand parking lot in Manhattan Beach, because the parking lot entrance is narrow and trenching/ excavations would be in an area that could block access. Reduction in access is temporary and would be reduced if construction of this sewer line connection occurred during the off-peak recreational season (i.e. winter) and on a weekday.

However, if the sewer line were to be constructed during the peak summer season, there would be sufficient room in the parking lot driveway for a single lane to be kept open at all times during construction. Condition of Certification **LAND-6** has been proposed for the project to ensure that this potential effect would be less than significant. See the **TRAFFIC AND TRANSPORTATION** section for additional discussion of this parking access issue.

Coastal Commission Consistency and Suitability Report

Section 30413 of the Coastal Act requires the preparation of a consistency and suitability report by the Coastal Commission on the project for presentation to the Energy Commission on new power plants being placed in the Coastal Zone. The report must include the following key findings:

1. the compatibility of the proposed site and related facilities with the goal of protecting coastal resources;
2. the degree to which the proposed site and related facilities would conflict with other existing or planned coastal-dependent land uses at or near the site;
3. the potential adverse effects that the proposed site and related facilities would have on aesthetic values;
4. the potential adverse environmental effects on fish and wildlife and their habitats;
5. the conformance of the proposed site and related facilities with certified local coastal programs in those jurisdictions;
6. the degree to which the proposed site and related facilities could reasonably be modified so as to mitigate potential adverse effects on coastal resources, minimize conflict with existing or planned coastal-dependent uses at or near the site, and promote the policies of this division; and
7. any other matter(s) that the Coastal Commission deems appropriate and necessary in the implementation of the Coastal Act applicable to the project.

The Coastal Commission's report discussing the project's land use consistency ("findings") with the Coastal Act was not available to be incorporated into the land use analysis of the Energy Commission's Final Staff Assessment (FSA). The Coastal Commission will be submitting their final consistency/suitability report discussing land use after the public release of the FSA. The Coastal Commission's report may be filed as testimony during the evidentiary hearings to be conducted on the project by the Energy Commission.

WARREN-ALQUIST ACT – ESTABLISHMENT OF AREA FOR PUBLIC USE

The applicant is providing public use area(s) along the perimeter of the ESGS's west property line that borders the Class 1 bicycle path and Dockweiler State Beach. As depicted in the applicant's Conceptual Landscape Plan dated April 23, 2002, the

applicant will be relocating the existing fence three feet back from its current location to allow the installation of public park type benches and landscaping along the bicycle path. The public use land area(s) will continue to be owned and maintained by the applicant. The proposed landscaping along the bicycle path will include small trees and flowering shrubs. The applicant is also proposing to install a concrete sea wall to help screen ground level views of the power plant from the bike path. The **VISUAL RESOURCES** section of this FSA provides additional discussion of landscaping proposed for the project, including Conditions of Certification.

CALIFORNIA STATE LANDS COMMISSION LEASE

Any person who uses or occupies any lands owned or controlled by the State under the jurisdiction of the State Lands Commission (SLC) is required to obtain a lease, permit or other agreement and provide payment for rent.

The two intake structures on the El Segundo Generating Station property are on tideland and submerged land owned and administered by the State of California. The applicant has an executed lease with the State of California. The executed lease (No. 858.1 Public Resources Code Series, Ser. 18736A) is scheduled to expire on October 27, 2002. The applicant has not yet filed an application with the SLC requesting a modification of the existing lease or creation of a new lease. Regardless of the stated expiration date in the lease, the actual termination of a SLC lease does not occur until such time as the SLC formally acts to terminate it. As long as the leaseholder (applicant) continues to operate in compliance with the original executed lease, the SLC would permit the operation/use to continue on a month to month basis until a new lease is executed with the State Lands Commission.

To ensure the long-term use of the intake structure for the project and the project's compliance with SLC regulations, staff is recommending a condition of certification requiring the applicant to acquire a new lease prior to the start of commercial operation of the ESPR facility (see **LAND-10**). Assuming that the applicant is approved for a new lease by the SLC, the proposed project would be in compliance with the requirements for the leasing of State owned tideland and submerged lands.

Any structural modification or use of the facility's existing seawater intake structure is subject to consistency with the SLC executed lease.

STATE SUBDIVISION MAP ACT

When the Southern California Edison (SCE) Company owned the ESGS property it consisted of a number of underlying parcels totaling approximately 33 acres. SCE filed a lot line adjustment application with the City of El Segundo resulting in the creation of three parcels (Parcel 1 – 2.25 ac., Parcel 2 – 9.0 ac., Parcel 3 – 24.7). Parcel 3 contains both the operating ESGS and the proposed ESPR site. The Director of the City of El Segundo Planning and Building Safety on December 23, 1997 signed the Certificate of Compliance. The Certificate of Compliance was recorded at the Los Angeles County Recorder's Office on December 23, 1997 and is identified as Document No. 97-2012822.

The applicant purchased Parcel 3 from SCE in 1998. Since the Certificate of Compliance remains valid, the ESPR site is consistent with the Subdivision Map Act.

SCE will continue to maintain ownership of Parcel 1, which contains the electric transmission-switching yard. The applicant has purchased Parcel 2. This parcel contains two abandoned fuel oil storage tanks.

LOCAL

City of El Segundo

General Plan

The El Segundo General Plan Land Use Element identifies the land use designation for portions of the City outside of the Coastal Zone. **LAND USE Figure 2** depicts General Plan land use designations for the area. The Local Coastal Program designation supercedes the General Plan land use designation.

The ESPR's associated linear facilities, including the water pipelines, natural gas pipelines, and sewer pipelines, are a consistent use allowed by the El Segundo General Plan pursuant to Goal LU 7: Provision of Quality Infrastructure.

Local Coastal Program

The Local Coastal Program land use designation for the project site is "Power Plant". The proposed power plant is an allowed use in this designation. Therefore, this use is consistent with the Local Coastal Program.

The Local Coastal Program specifies that modifications to existing facilities shall be subject to the requirements of El Segundo's M2 Zone District. Permitted uses in the M2 Zone "shall not be objectionable by reason of noise, odor, dust, smoke, mud, vibration, refuse, or other similar causes" (Section 20.42.030 (3) El Segundo Zoning Ordinance). See the **NOISE, AIR QUALITY**, and **PUBLIC HEALTH** sections of the FSA for further discussion on these issues. Project impacts in these areas would be less than significant after mitigation measures have been implemented.

Zoning

The M2 Zone District identifies steam electric generating stations as a permitted use. The proposed project is therefore consistent with the use requirements of the El Segundo Zoning Ordinance.

Title 20-Zoning Chapter 20.41 Heavy Industrial (M2) Zone District Section 20.41.060(c) Height states that buildings and structures shall not exceed a height of 200 feet. Exhaust stacks are subject to Title 20-Zoning Chapter 20.12 Chapter 20.12 General Provisions Section 20.12.030 Exceptions to Building Height, which states chimneys and smokestacks may be erected above the 200 feet height limit. Therefore, the 215-foot high exhaust stacks and the buildings proposed by the ESPR project would be consistent with the zone district height requirements.

To ensure that the ESPR project conforms with applicable portions of the El Segundo Zoning Ordinance, staff is recommending that the Commission require the following Conditions of Certification:

LAND-1 regarding compliance with the design and performance standards for the M2 Zone District;

LAND-2 regarding compliance with the City's parking standards;

LAND-3 regarding compliance with any City outdoor advertising regulations applicable to any ESPR signs erected (either temporary or permanent);

LAND-4 regarding the review and comment by the City or other applicable agencies on descriptions of the final laydown/staging areas identified for construction of the ESPR;

LAND-5 regarding compliance with FAA regulations for marking and/or lighting new exhaust stacks.

INSERT FIGURE 2

City Of Los Angeles

The ESPR includes a water line that would be built within the City of Los Angeles, Playa Del Rey community.

General Plan

The City of Los Angeles General Plan designates the area around Grand Avenue as “Heavy Industrial”. Subsurface water lines are acceptable in this area. The Westchester-Playa Del Rey Community Plans (a portion of the Los Angeles General Plan) do not provide any policies, regulations or standards related to construction of water lines within the public right-of-way. An excavation permit is required for the proposed water line from the City’s West Los Angeles Bureau of Engineers.

Zoning

The City of Los Angeles Zoning Code does not contain any regulations related to construction of water lines.

City of Manhattan Beach

The ESPR includes a sewer line that would be built within the City of Manhattan Beach.

General Plan

The City of Manhattan Beach General Plan does not provide any policies relevant to construction of a sewer line within the public right-of-way. An encroachment permit is required from the City’s Public Works Department for the sewer line connection.

Zoning

The City of Manhattan Beach Zoning Ordinance does not provide any regulations relevant to construction of a sewer line within the public right-of-way. The City expressed concern that construction of the sewer line would reduce access to the parking lot on the beach. As a result the applicant has agreed to place an iron plate over the trenching/excavation to maintain beach access or to bore an underground connection to the manhole located in the Strand parking lot, approximately 200 feet from the ESGS property.

COMPATIBILITY WITH EXISTING AND PLANNED LAND USE

The current development pattern for the project site and the area surrounding it as established by the El Segundo General Plan is for heavy industrial uses. **LAND USE Figure 3** depicts the location of existing land uses for the area.

The ESGS has been operating at this location since 1955. The proposed ESPR would be constructed on the site of the existing power plant facility. The proposed ESPR project is compatible with the existing power plant use and neighboring recreational uses that include State owned beaches. The proposed project is also consistent with existing heavy industrial and energy uses to the north and east of the project site. The ESPR project is approximately 2,200 feet from residential uses to the south located within the City of Manhattan Beach. A portion of the ESGS property separates the

residences from the ESPR. Potential noise issues are discussed in the section on **NOISE**.

Linear facilities including the water, reclaimed water, ammonia, and sewage pipelines are all compatible with nearby uses. The water and wastewater supply lines would be constructed in the existing road right-of-way located in commercial, residential, and heavy industrial areas. These pipelines would be constructed according to local engineering requirements and would be buried under the pavement after construction. During construction, there may be some temporary reduction in vehicular access to residences or businesses where pipelines are to be constructed in the public-right-of-way.

Since vehicular access is being affected by pipeline construction, a condition of certification recommended under the **TRAFFIC AND TRANSPORTATION** section of this FSA, **TRANS-5** requires residents and businesses be notified prior to any construction activity.

After construction, the land use impacts of the project's linear features would be insignificant because the pipelines would be buried and would not interfere with adjacent uses.

Fuel Tank Farm Area

The fuel tank farm area is located on Parcel 2, an approximate 9 acre area that contains two large tanks that were used to store fuel oil used by the ESGS. The fuel tanks are no longer used since the ESGS switched to natural gas delivered by pipeline.

The applicant proposes to use Parcel 2 as a construction laydown and staging area for the ESPR project. Upon completion of the ESPR project the existing tanks are to be removed from the parcel. Parcel 2 is to be used as an overflow parking area. At this time, the applicant is not proposing any development on the property.

Representatives from the Cities of El Segundo and Manhattan Beach and residents of the El Porto community within the City of Manhattan Beach have asked questions regarding the fuel tanks during several public workshops. They were concerned with the timing of the removal of the two fuel tanks, and the applicant's plan for future use of the parcel after tank demolition. Specific concerns raised by the El Porto residents pertained to noise and visual concerns. The tanks provide a noise and visual buffer between the existing power block area of the ESGS facility and the El Porto community. For further discussion of the noise and visual issues regarding the project see the **NOISE** and **VISUAL RESOURCES** sections of the FSA.

INSERT FIGURE 3

The City of El Segundo and the Manhattan Beach representatives have asked that any proposed development plans on the parcel be made available for early review by the Cities, and that the development be consistent with the City of El Segundo's General Plan, Local Coastal Plan and zoning regulations.

The applicant submitted a proposed preliminary Tank Farm Plan dated May 4, 2001 (docketed May 7, 2001) to the Energy Commission for distribution and review by the concerned parties. The Plan focuses on the demolition process to be used for the tanks and the time (phase) sequence for it. The draft plan describes four phases: Phase I – Preparation of the Tank Farm Area, Phase II – Use of Tank Farm Area During Demolition of Units 1 and 2, Phase III – Use of Tank Farm Area During Construction of Units 5, 6, 7 and Phase IV: Remediation and Public Benefit. Major components of the plan include: Use of the tanks as a visual and sound buffer for the El Porto community until an earthen berm can be constructed along the south property line of Parcel 2, and tank farm demolition activity, site and time restrictions. Staff has proposed Conditions of Certification **LAND-7**, **LAND-8** and **LAND-9** to address the concerns of the Cities and local residents.

CUMULATIVE IMPACTS

Cumulative land use impacts may occur when a project has effects that are individually limited but cumulatively considerable when viewed together with effects of related new residential, commercial, and industrial projects.

LAND USE Table 1 (below) displays the reasonably foreseeable significant sized development projects within the Cities of El Segundo and Manhattan Beach.

LAND USE Table 1

Development	Size (approx.)	Location	Jurisdiction	Status
Class A office space	3.5 million sq. ft.	City-wide	El Segundo	Portions currently in environmental review, plan check or under construction.
Grand Ave Corporate Center	Includes two hotels, a health care facility, and two office buildings	North side of the City	El Segundo	City has completed permitting of the project.
Mixed-use Development	2.5 million sq. ft.	West side of the City	El Segundo	An EIR is currently being prepared for the project.
El Segundo Corporate Campus	2.5 million sq. ft.	Unknown	El Segundo	An EIR is currently being prepared for the project.
Civic Center/Metlox Development Project	220,000 sq. ft.	Downtown Commercial District	Manhattan Beach	The City is completing permitting on the project.

These developments can be characterized as primarily mixed-use and commercial sectors with limited residential uses.

Depending on the timing of the start of construction for the above noted projects and the ESPR, there may be some traffic flow disruptions and/or inconveniences within the City of El Segundo.

The applicant will be working with the City of El Segundo to prepare a traffic control plan (see **TRANS-5** in the **TRAFFIC AND TRANSPORTION** section of this FSA), which would resolve potential traffic conflicts in the event that the schedules of the above noted projects overlap the ESPR project's construction schedule.

The ESPR project is not expected to make a significant contribution to regional impacts related to new development and growth, such as population immigration, the resultant increased demand for public services, and expansion of public infrastructure such as water and natural gas pipelines to serve residential development

Staff is not aware of any new significant development projects occurring within the Playa Del Rey community that may generate a cumulative effect to the region and the ESPR project.

ENVIRONMENTAL JUSTICE

Staff has reviewed Census 2000 information that shows the minority population is greater than fifty percent within a six-mile radius of the proposed El Segundo Power Redevelopment Project (please refer to **SOCIOECONOMICS** Figure 1 in this Final Staff Assessment) and Census 1990 information that shows the low-income population is less than fifty percent within the same radius (approximately 2.3 miles east of the project site). Based on the land use analysis, staff has not identified significant direct or cumulative impacts resulting from the construction or operation of the project effecting a defined disproportionate environmental justice population based on the land use analysis, therefore, there are no land use environmental justice issues related to this project.

FACILITY CLOSURE

At some point in the future, the ESGS would cease operation and close down. At that time, it would be necessary to ensure that closure occurs in such a way that public health and safety and the environment are protected from adverse impacts.

At least twelve months prior to the initiation of decommissioning, the applicant would prepare a Facility Closure Plan for Energy Commission review and approval. This review and approval process would be public and allow participation by interested parties and other regulatory agencies. At the time of closure, all applicable LORS would be identified and the closure plan would discuss conformance of decommissioning, restoration, and remediation activities with these LORS. All of these activities would fall under the authority of the Energy Commission.

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

CONCLUSIONS

The land use analysis for the project focused on two main issues: (1) the project's consistency with land use laws, ordinances, regulations, standards and policies, and (2) the project's compatibility with existing and planned land uses.

1. The Energy Commission has received a partial Coastal Commission consistency and suitability report with a determination that biology and visual issues are inconsistent with the Coastal Act. The Coastal Commission has not made findings related to the balance of project-related issues, including the project's land use consistency. Therefore, staff can not make a final conclusion that the project is consistent with the California Coastal Act at this time.
2. The proposed project is compatible with the heavy industrial character of the site.
3. The project does not disrupt or divide the physical arrangement of an established community.
4. There are no agricultural uses or restrictions in the vicinity of the ESGs.
5. The proposed project is consistent with the applicable LORS in the Cities of El Segundo, Manhattan Beach, and Los Angeles.
6. With mitigation, operation of the project may not cause any significant noise, dust, public health, traffic, or visual impacts to nearby land uses (see those FSA sections for more detailed information).

RECOMMENDATIONS

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

PROPOSED CONDITIONS OF CERTIFICATION

LAND-1 The project owner shall comply with the minimum design and performance standards for the M2 Zone District set forth in the City of El Segundo Zoning Ordinance where applicable for this project.

Verification: At least 30 days prior to the start of construction, the project owner shall submit written documentation, including evidence of review by the City of El Segundo that the project meets the above referenced requirements and has been reviewed by the City of El Segundo.

LAND-2 The project owner shall comply with the parking standards established by the City of El Segundo Zoning Ordinance (Title 8, Chapter 5).

Verification: At least 30 days prior to start of construction, the project owner shall submit to the CPM, written documentation, including evidence of review by the City of El Segundo that the project conforms to all applicable parking standards.

LAND-3 The project owner shall ensure that any signs erected (either permanent or for construction only) comply with the outdoor advertising regulations established by the City of El Segundo Zoning Ordinance (Chapter 18).

Verification: At least 30 days prior to start of construction, the project owner shall submit to the CPM, written documentation, including evidence of review by the City of El Segundo that all erected signs will conform to the zoning ordinance.

LAND-4 The project owner shall identify the secured lay down/staging area(s) for the project prior to site mobilization.

Verification: The project owner shall provide a plot plan and location map showing the lay down/staging area(s) to the local government of jurisdiction (i.e. County of Los Angeles, the City of El Segundo, City of Manhattan Beach, etc.) planning department and to the California Coastal Commission if located within the State designated Coastal Zone.

The local government of jurisdiction and the Executive Director of the California Coastal Commission if applicable shall have 30 calendar days to provide written comments to the CPM on the lay down/staging area(s) to review for approval.

If the project owner requires additional off-site lay down/staging area, the project owner shall file a request for an amendment to their permit with the CPM.

At least 30 days prior to the start of site mobilization, the project owner shall provide to the CPM for review and approval the secured lay down and staging area(s).

LAND-5 The project owner shall provide appropriate evidence of compliance with Federal Aviation Administration (FAA) regulations regarding the marking and/or lighting of the project's new exhaust stacks.

Verification: Pursuant to the schedule contained in Condition of Certification **TRANS-6** the project owner shall submit copies of the FAA Form 7460-1 with copies of the FAA response to Form 7460-1 to the CPM.

LAND-6 The project owner shall either bore the proposed sewer line under 45th Street in the City of Manhattan Beach or use conventional excavation techniques using steel cover plates to allow traffic to have access to the Strand parking lot at all times. The time period necessary to complete the 45th Street sewer excavation/trenching and connection shall be kept to a minimum. The applicant shall obtain the required encroachment permit(s) from the local government of jurisdiction(s). The sewer line shall be constructed during the off-peak season.

Verification: The project owner shall submit to the City of Manhattan Beach Public Works Department an encroachment permit application for their review and approval and to the CPM for final approval. The permit application shall include a description of the method that would be used to complete any excavations in 45th Street. The application shall include the proposed time to begin and complete the

sewer line connection. Also, the permit application shall illustrate how the construction crew and traffic control will ensure that access to the parking lot is not disrupted.

The project owner shall monitor the construction of the sewer line in the 45th Street right-of-way at all times and promptly notify the City of Manhattan Beach Public Works Department and CPM of any difficulties experienced.

Prior to any ground disturbance within the 45th Street public right-of-way a copy of the City of Manhattan Beach approved/issued encroachment permit shall be submitted to the CPM.

The CPM or City of Manhattan Beach designated representative may conduct random site visits to verify compliance, and the CPM may temporarily stop construction to ensure access is maintained.

LAND-7 The project owner shall provide written notification to the CPM when any plans for use of the abandoned fuel tank farm area (Parcel 2) are developed and indicate whether the project owner believes such plans are subject to the Energy Commission's permitting authority in accordance to the Warren-Alquist Act. The written notification shall include a description of the development and an analysis of which agency has proper jurisdiction over the development according to the enacted laws, ordinances and standards in effect at the time such development is to be proposed.

Verification: The project owner shall provide written notification to the planning departments of the City of El Segundo and the City of Manhattan Beach and to the Executive Director of the California Coastal Commission who shall have 30 calendar days to provide written comments to the CPM to review.

At least 60 days prior to submitting any building permit applications to any other agency for development of the abandoned fuel tank farm area (Parcel 2); the project owner shall provide a copy of the written notification to the CPM. The project owner shall also provide copies of the written notification sent to the Cities of El Segundo, Manhattan Beach and to the Executive Director of the California Coastal Commission to the CPM.

LAND-8 The abandoned fuel storage tanks on Parcel 2 shall be removed prior to the start of commercial operation of the new generating units. Any site remediation and/or soil restoration activities required by appropriate authorities shall be completed following tank removal.

Verification: The project owner shall submit a detailed schedule for the removal of the fuel storage tanks, site remediation and/or soil restoration to the CPM for review and approval prior to the start of construction.

LAND-9 The project owner shall provide copies of final grading and drainage plans to the planning departments of the Cities of El Segundo and Manhattan Beach.

Verification: Pursuant to the schedule contained in Condition of Certification **CIVIL-1** the project owner shall also submit copies of the proposed drainage structures

and grading plan to the City of El Segundo planning department and the City of Manhattan Beach planning department concurrent with their submittal to the Chief Building Official (CBO) and CPM.

Land-10 The project owner who is the lessee of a lease (No. 858.1 Public Resources Code Series, SER. 18736A) involving tideland and submerged land owned by the State of California that is scheduled to expire October 27, 2002 shall provide to the CPM a copy of a new/amended lease executed with the California State Lands Commission. The new/amended lease shall secure the applicant's long term use of the seawater intake (Outfall No. 001) to service the proposed project. The new/amended lease shall be executed prior to the start of commercial operation of the new generating units for the project.

Verification: The project owner shall submit an application requesting a new/amended lease to the California State Lands Commission in accordance with the California State Lands Commission Regulations. The project owner shall provide the CPM with a copy of the submitted application filed with the State Lands Commission.

The project owner shall submit to the CPM a copy of the new/amended executed lease agreement with the California State Lands Commission.

LAND-11 The project owner shall provide copies of the final perimeter landscape plan(s) to the CPM. Said landscape plans shall include the installation of public park type benches along the west property line of the ESGS property.

Verification: Pursuant to the schedule contained in Visual Resources Conditions of Certification, the project owner shall submit copies of the proposed perimeter landscaping plan to the City of El Segundo and the City of Manhattan Beach for review and comment and to the CPM for review and approval.

REFERENCES

CALTRANS (California Transportation) – 2001a – Email Gary Cathey, Acting Chief Office of Airports to Mark Hamblin, Planner II, Energy Commission, regarding height of stacks not penetrating FAR Part 77, February 16, 2001.

CALTRANS (California Transportation) – 2001b – Letter regarding height of stacks not penetrating FAR Part 77. Submitted to the California Energy Commission on April 23, 2001.

CCC (California Coastal Commission) - 2000a - Coastal Commission Preliminary Review. Submitted to the California Energy Commission on February 14, 2001.

CCC (California Coastal Commission) – 2001 - Telephone communication Tom Luster California Coastal Commission, Energy and Ocean Resources Unit with Michael Berman, Consultant, Energy Commission, March 9, 14, and 15, 2001.

- CCC (California Coastal Commission) – 2001- Letter from Tom Luster, California Coastal Commission, Energy and Ocean Resources Unit to James Reede, Project Manager, Energy Commission March 26, 2001.
- CCC (California Coastal Commission/Wan) – 2002a – Coastal Commission Visual Findings on AFC-POS. Submitted to the California Energy Commission on March 5, 2002.
- CCC (California Coastal Commission/Wan) – 2002b – Coastal Commission Findings Conformity with Marine Resources Coastal Act Policies POS. Submitted to the California Energy Commission April 9, 2002.
- CCC (California Coastal Commission/Luster) – 2002c – Coastal Commission staff response to the May 2002 Visual Enhancement Proposals POS. Submitted to the California Energy Commission on June 10, 2002.
- COES (City of El Segundo) -1980 - Local Coastal Program, July 1980.
- COES (City of Segundo) - 1992 – General Plan, December 1, 1992.
- COES (City of El Segundo) - 1996 - Municipal Code Title 15 - Zoning, February 6, 1996. (Amended December 4, 2001).
- COES (City of El Segundo) – 2001- Telephone communication Paul Garry, City of El Segundo Planning Division, Senior Planner with Michael Berman, Consultant, Energy Commission, March 14, 15, 2001.
- COLA (City of Los Angeles) - No Date - Westchester-Playa Del Rey Plans. No Date.
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- COLA (City of Los Angeles) – 2001 - Telephone communication Rudy Olsen, City of Los Angeles, West Los Angeles Bureau of Engineering with Michael Berman, Consultant, Energy Commission, March 14, 2001.
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- COMB (City of Manhattan Beach) - 1993 - Housing Element, March 1993.
- COMB (City of Manhattan Beach) - 1998 - General Plan, February 1998.
- COMB (City of Manhattan Beach) -1998 - Local Coastal Program Phase III Implementation Program, April 1998.

COMB (City of Manhattan Beach) – 2001 – Telephone communication Lori Jester, Senior Planner, City of Manhattan Beach Planning Department, with Michael Berman, Consultant, Energy Commission, March 8, 14, and 15, 2001.

CSLC (California State Lands Commission) – 2002 - Email Jane Smith, legal counsel, to James Reede, Project Manager, Energy Commission regarding modifications to draft State Lands Commission section, June 26, 2002.

ESPR (El Segundo, Power Station) - 2000a - Application For Certification. Submitted to the California Energy Commission on December 18, 2000.

ESPR (El Segundo Power Station) –2000s – FAA Determination of No Hazard to Air Navigation. Submitted to the California Energy Commission on March 9, 2001.

ESPR (El Segundo Power Station) - 2000r - Applicant's Response to Staff's Data Requests, Sets One and Two. Submitted to the California Energy Commission on April 20, 2001.

ESPR (El Segundo Power Station) – 2002 – Applicant's Responses to Staff Data Requests to California Energy Commission Cultural Resources, Geological Resources, Noise, Visual Resources and "public" data requests. Submitted to the California Energy Commission on May 4, 2001.

FAA (Federal Aviation Administration) – 2001 – Telephone communication Karen McDonald, Specialist, Airspace Branch with Michael Berman, Consultant, Energy Commission, March 15, 2001.

LACDBH (Los Angeles County Department of Beaches and Harbors) - 2001- Telephone communication Vivian Paquin, Real Property Agent, with Michael Berman, Consultant, Energy Commission, March 27, 2001.

LACDBH (Los Angeles County Department of Beaches and Harbors) - 2001- Telephone communication Joe Chesler, Chief of Planning with Michael Berman, Consultant, Energy Commission, March 28, 2001.

LACDBH (Los Angeles County Department of Beaches and Harbors) - 2001- Telephone communication Greg Woodell, Planning Specialist with Michael Berman, Consultant, Energy Commission, March 28, 2001.

LAX (Los Angeles International Airport) – 2001 - Telephone communication Evelyn Quintanilla, Associate Planner with Michael Berman, Consultant, Energy Commission, March 9, 2001.

NOISE AND VIBRATION

Testimony of Jim Buntin

INTRODUCTION

The construction and operation of any power plant creates noise, or unwanted sound. The character and loudness of this noise, the times of day or night that it is produced, and the proximity of the facility to sensitive receptors combine to determine whether the facility would meet applicable noise control laws and ordinances, and whether it would cause significant adverse environmental impacts. In some cases, vibration may be produced as a result of power plant operation or of construction practices, such as pile driving. The ground-borne energy of vibration has the potential to cause structural damage and annoyance.

The purpose of this analysis is to identify and examine the likely noise and vibration impacts from the construction and operation of the El Segundo Power Redevelopment Project (00-AFC-14), and to recommend procedures to ensure that the resulting noise and vibration impacts would be adequately mitigated to comply with applicable laws, ordinances, regulations, and standards (LORS).

LAWS, ORDINANCES, REGULATIONS AND STANDARDS

FEDERAL

Under the Occupational Safety and Health Act of 1970 (29 U.S.C. § 651 et seq.), the Department of Labor, Occupational Safety and Health Administration (OSHA) has adopted regulations (29 C.F.R. § 1910.95) designed to protect workers against the effects of occupational noise exposure. These regulations list permissible noise exposure levels as a function of the amount of time to which the worker is exposed (see **Noise: Appendix A, Table A4** immediately following this section). The regulations further specify a hearing conservation program that involves monitoring the noise to which workers are exposed, assuring that workers are made aware of overexposure to noise, and periodically testing the workers' hearing to detect any degradation.

There are no federal laws governing off-site (community) noise.

The Federal Transit Administration (FTA) has published guidelines for assessing the impacts of ground-borne vibration associated with construction of rail projects, which have been applied by other jurisdictions to other types of projects. The FTA-recommended vibration standards are expressed in terms of the "vibration level," which is calculated from the peak particle velocity measured from ground-borne vibration. The FTA measure of the threshold of perception is 65 VdB, which correlates to a peak particle velocity of about 0.002 inches per second (in/sec). The FTA measure of the threshold of architectural damage for conventional sensitive structures is 100 VdB, which correlates to a peak particle velocity of about 0.2 in/sec.

STATE

California Government Code Section 65302(f) encourages each local government entity to perform noise studies and implement a noise element as part of its General Plan. In addition, the California Office of Planning and Research has published guidelines for preparing noise elements, which include recommendations for evaluating the compatibility of various land uses as a function of community noise exposure. The State land use compatibility guidelines are listed in **NOISE: Table 1**.

NOISE: Table 1 - Land Use Compatibility for Community Noise Environment

LAND USE CATEGORY	COMMUNITY NOISE EXPOSURE - Ldn or CNEL (db)							
	50	55	60	65	70	75	80	
Residential - Low Density Single Family, Duplex, Mobile Home	[Solid black shading from 50 to 60 db]							
	[Diagonal hatching from 70 to 80 db]							
	[White background]							
Residential - Multi-Family	[Solid black shading from 50 to 60 db]							
	[Diagonal hatching from 70 to 80 db]							
	[White background]							
Transient Lodging – Motel, Hotel	[Solid black shading from 50 to 60 db]							
	[Diagonal hatching from 70 to 80 db]							
	[White background]							
Schools, Libraries, Churches, Hospitals, Nursing Homes	[Solid black shading from 50 to 60 db]							
	[Diagonal hatching from 70 to 80 db]							
	[White background]							
Auditorium, Concert Hall, Amphitheaters	[Solid black shading from 50 to 60 db]							
	[Diagonal hatching from 65 to 80 db]							
	[White background]							
Sports Arena, Outdoor Spectator Sports	[Solid black shading from 50 to 60 db]							
	[Diagonal hatching from 70 to 80 db]							
	[White background]							
Playgrounds, Neighborhood Parks	[Solid black shading from 50 to 60 db]							
	[Diagonal hatching from 70 to 80 db]							
	[White background]							
Golf Courses, Riding Stables, Water Recreation, Cemeteries	[Solid black shading from 50 to 60 db]							
	[Diagonal hatching from 70 to 80 db]							
	[White background]							
Office Buildings, Business Commercial and Professional	[Solid black shading from 50 to 60 db]							
	[Diagonal hatching from 70 to 80 db]							
	[White background]							
Industrial, Manufacturing, Utilities, Agriculture	[Solid black shading from 50 to 60 db]							
	[Diagonal hatching from 70 to 80 db]							
	[White background]							
Normally Acceptable	Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements.							
Conditionally Acceptable	New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features are included in the design.							
Normally Unacceptable	New construction or development should be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirement must be made and needed noise insulation features included in the design.							
Clearly Unacceptable	New construction or development generally should not be undertaken.							

Source: State of California General Plan Guidelines, Office of Planning and Research, June 1990.

The State of California, Office of Noise Control, prepared a Model Community Noise Control Ordinance, which provides guidance for acceptable noise levels in the absence

of local noise standards. The Model also contains a definition of “pure tone” which can be used to determine whether a noise source contains significant pure tone components. The Model Community Noise Control Ordinance states that a pure tone exists if the one-third octave band sound pressure level in the band with the tone exceeds the arithmetic average of the two contiguous bands by 5 decibels (dB) for center frequencies of 500 Hz and above, or by 8 dB for center frequencies between 160 Hz and 400 Hz, or by 15 dB for center frequencies less than or equal to 125 Hz. The Model Community Noise Control Ordinance further recommends that, when a pure tone is present, the applicable noise standard should be lowered (made more stringent) by 5 dBA.

Other State LORS include the California Environmental Quality Act (CEQA) and the California Occupational Safety and Health Administration (Cal-OSHA) regulations.

California Environmental Quality Act

CEQA requires that significant environmental impacts be identified, and that such impacts be eliminated or mitigated to the extent feasible. Section XI of Appendix G of CEQA Guidelines (Cal. Code Regs., tit. 14, App. G) sets forth some characteristics that may signify a potentially significant impact. Specifically, a significant effect from noise may exist if a project would result in:

1. exposure of persons to or generation of noise levels in excess of standards established in the local General Plan or noise ordinance, or applicable standards of other agencies;
2. exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels;
3. a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project; or
4. a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project....

The Energy Commission staff, in applying Item c) above to the analysis of this and other projects, has concluded that a potential for a significant noise impact exists where the noise of the project plus the background exceeds the background by 5 dBA L_{90} or more at the nearest sensitive receptor.

Noise due to construction activities is usually considered to be insignificant in terms of CEQA compliance if:

1. The construction activity is temporary,
2. Use of heavy equipment and noisy activities is limited to daytime hours, and
3. All feasible noise abatement measures are implemented for noise-producing equipment.

Cal-OSHA

Cal-OSHA has promulgated Occupational Noise Exposure Regulations (Cal. Code Regs., tit. 8, §§ 5095-5099) that set employee noise exposure limits. These standards are equivalent to the federal OSHA standards (see **NOISE: Appendix A, Table A4**).

LOCAL

El Segundo Municipal Code

The City of El Segundo has adopted a noise control ordinance as part of the City Municipal Code, Chapter 9.06. The noise ordinance prohibits the creation of noise within the City which causes the noise level when measured at the receptor to exceed 5 dBA above the ambient noise level (for residential property) or 8 dBA above the ambient noise level (for industrial property). If the receptor property is located on a boundary between two different noise zones, the lower noise level standard applicable to the quieter zone shall apply.

Increases to the noise standards may be permitted as shown by **NOISE: Table 1**.

Noise: Table 1 – El Segundo Municipal Code Noise Level Adjustments

Permitted Increase, dBA	Duration of Increase (minutes)*
0	30
5	15
10	5
15	1
20	Less than 1

* Cumulative minutes during any one hour

The City noise standard is therefore based upon the ambient L_{50} , or median, noise level. The above noise standards are applied at any point on the receptor property.

Noise due to construction is exempted from the noise standards during the hours of 7:00 a.m. and 6:00 p.m., Monday through Saturday, provided that the noise level does not exceed 65 dBA plus the limits shown by **NOISE: Table 1** as measured on the receptor residential property line, and provided that any vibration created does not endanger the public health, welfare and safety.

The El Segundo Municipal Code prohibits creation of vibration which is perceptible without use of instruments to any reasonable person of normal sensitivity at any point on any affected property.

Since these El Segundo Municipal Code sections regulate noise produced in the City limits, these standards are the primary local noise regulations affecting this project.

Manhattan Beach Municipal Code

The City of Manhattan Beach has adopted a noise control ordinance as part of the City Municipal Code, Chapter 5.48. The noise ordinance prohibits the creation of noise within the City which causes the noise level when measured at any residential property to exceed the noise standards shown by **NOISE: Table 2**.

Noise: Table 2 – Manhattan Beach Municipal Code Residential Noise Standards

Descriptor	Allowable Noise Level, dBA	
	7:00 a.m. to 10:00 p.m.	10:00 p.m. to 7 :00 a.m.
L ₅₀ (30 minutes/hour)	50	45
L ₂₅ (15 minutes/hour)	55	50
L ₈ (5 minutes/hour)	60	55
L ₂ (1 minute/hour)	65	60
L ₀ (maximum)	70	65
L _{eq} (equivalent)	55	50

If the measurement location is on a boundary between two different land uses, the noise level limit for the more restrictive land use classification, plus 5 dBA, applies. For any source of noise that emits a pure tone or contains impulsive noise, the noise standards are reduced by 5 dBA. If the ambient noise level exceeds any of the levels stated above, the ambient noise level becomes the noise standard.

Section 5.48.060 of the Manhattan Beach Municipal Code states that: “All construction activity shall be prohibited, except between the hours:

7:30 a.m. and 6:00 p.m. Mondays through Friday
9:00 a.m. and 6:00 p.m. Saturdays”

It has been stipulated that the Manhattan Beach Municipal Code noise standards will apply to the project. The City of Manhattan Beach has interpreted its ordinance, in this case, to require that the project not result in an increase of more than 2 dBA at the most affected residences, which are the homes adjacent to the south project boundary.

The major differences between the noise standards of the cities of El Segundo and Manhattan Beach are:

- The El Segundo Municipal Code allows operational noise to exceed the ambient noise level by up to 5 dBA. The Manhattan Beach Municipal Code does not allow operational noise (when it is higher than the stated noise standard) to exceed the ambient noise level at all. However, the City has indicated that, in this case, it will allow operational noise to exceed the ambient L₅₀ level by up to 2 dBA.
- The El Segundo Municipal Code exempts construction noise between the hours of 7:00 a.m. to 6:00 p.m. The Manhattan Beach Municipal Code exempts construction noise between the hours of 7:30 a.m. to 6:00 p.m.
- Outside of the hours stated above, the El Segundo Municipal Code allows construction, so long as the resulting noise level does not exceed the noise standard. The Manhattan Beach Municipal Code prohibits construction outside of the hours stated above.
- The El Segundo Municipal Code establishes a limit for construction noise of 65 dBA L₅₀ at the nearest residential property.

Section 10.60.120 of the Manhattan Beach Municipal Code relates to vibration, and applies to all use classifications in all zoning districts. This section states that “No use

activity, or process shall produce vibrations that are perceptible without instruments by a reasonable person at the property lines of a site.”

SETTING

PROJECT BACKGROUND

The El Segundo Power Redevelopment (ESPR) Project involves the construction and operation of a 630-megawatt (MW) power plant, which is proposed to be located at the existing El Segundo Generating Station site.

The new units will replace currently operating generation Units 1 and 2 with two state-of-the-art combined cycle units. Station net power will increase by approximately 280 MW with the addition of the new units. The new unit will consist of two gas-fired turbines and one steam turbine driven by the heat produced by the other two turbines.

The ESPR will continue to interconnect with the electrical grid at the existing Southern California Edison substation located adjacent to the plant site.

The Project will include demolition of the on site fuel oil tank farm, and of the existing Unit 1 and 2 equipment (boiler – steam turbine complex). Demolition of the tank farm is expected to take place over a period of six to nine weeks. The tank farm will be used as a staging area for power plant demolition for about one year, and as a staging area for construction of the new units for about eighteen months.

The equipment that has the greatest potential to generate significant noise levels during plant operation includes the gas and steam turbines, steam generators, pumps, motors, main transformers, and an instrument air compressor. During construction of the project, demolition of the tanks has the potential to produce significant noise levels at the nearest residences. In addition, removal of the tanks is expected to result in an increase in ambient noise levels from the existing Units 3 and 4, as the removal will eliminate a significant barrier to sound propagation in that direction.

EXISTING LAND USE

Power Plant Site

This site is located within the City of El Segundo, Los Angeles County, bordered on the west by the Pacific Ocean and on the east by Vista Del Mar Boulevard. The beachfront is property of the State of California, administered by the City of Manhattan Beach. The beachfront includes a bike path which is regularly used by pedestrians, joggers, skaters and bicyclists. The south property boundary is 45th Street, and residences are located on the south side of that street. These residences are in the City of Manhattan Beach. The Project would be located within the existing El Segundo Generating Station property, where the current Units 1 and 2 are located. Land uses in the project vicinity include recreational, residential, commercial, school and business uses.

Noise from the existing plant has little effect on the background acoustical environment at residences in the near vicinity. The closest noise sensitive receptors are homes located at the north end of The Strand, which is immediately south of the plant boundary. These houses are shielded from plant noise by the existing tank farm, so that the dominant background noise source there is the ocean surf. On the west side of the plant, the plant noise is dominant immediately adjacent to the property boundary, decreasing in effect as the observer moves toward the ocean surf. Traffic on Vista Del Mar Boulevard contributes to the daytime noise environment east of the plant site. North of the project site, and on the hillside east of the plant, the plant noise is audible and dominant.

The noise levels produced by the existing plant vary depending upon the level of power production. In general, plant noise is higher during daytime hours, when electrical demand is highest. The dominant plant noise sources appear to be the fans, generators and transformers.

The operation of the power plant includes notification of outside workers using a loudspeaker system. Residents south of the power plant have expressed concern about the level of sound produced by the loudspeakers, and the plant operator has pledged to resolve this issue outside of the Energy Commission permit process.

The project will involve replacing the electrical generation equipment which is most distant from the residential receptors. This is not expected to have a significant noise effect, as the existing Units 3 and 4 provide some shielding of the new units from the residences. However, the removal of the tank farm is likely to increase the ambient noise levels at the nearest residential receptors due to the removal of the effective noise barriers provided by the tanks.

Linear Facilities

The ESPR will continue to interconnect with the electrical grid at the existing Southern California Edison substation located on the plant site. Therefore, no off-site linear facility construction is required for this project. (ESPR 2000a, AFC § 3.6)

The ESPR will require new potable and fire water supply pipelines, as well as a new sanitary sewer, to be placed in city streets in El Segundo.

EXISTING NOISE LEVELS

In order to predict the likely noise effects of the project on adjacent sensitive receptors, the applicant commissioned ambient noise surveys of the area. The surveys were conducted at various hourly time intervals in July, August, and November 2000, and were supplemented in April 2001. The noise surveys were conducted using Bruel & Kjaer and Metrosonics sound level meters meeting the requirements of the American National Standards Institute (ANSI) for Type 1 and Type 2 sound level measurement systems. The measurements were performed at heights of approximately five feet above ground level to simulate the average height of the human ear (ESPR 2000a, AFC § 5.12.1.2).

The applicant's noise survey monitored existing noise levels at the following sixteen short-term monitoring locations, which are shown by **NOISE: Figure 1** and **NOISE: Figure 2**:

1. NW Corner of plant by PL
2. SW Corner of plant by PL
3. Midpoint along south PL
4. Near 120 45th Street
5. Near lifeguard station 61
6. Boardwalk by 4220 43rd Street
7. Sand Dune Park
8. Grand View Elementary School
9. Beach Babies Children's Center
10. Dockweiler State Beach
11. 119 Loma Vista Street
12. Opposite Unit 1 in plant recreation area
13. South end of recreation area
14. 120 feet from NW corner of Units 3 & 4
15. Near 318 45th Street
16. 304 Loma Vista Street

NOISE: Table 3 summarizes the ambient noise measurement results (ESPR 2000a, AFC § 5.12).

Noise: Table 3 - Summary of Short-Term Measured Noise Levels

Measurement Sites	Measured Noise Levels, dBA		
	Daytime		CNEL*
	L ₅₀	L ₉₀	
ST-1	60/58	59/56	65
ST-2	60	58	66
ST-3	56/54	54/52	61
ST-4	61	59	67
ST-5	62/59	61/57	66
ST-6	57/59	55/57	64
ST-7	56	53	62
ST-8	46	45	52
ST-9	59	54	65
ST-10	59	57	65
ST-11	51	50	57
ST-12	66	65	71
ST-13	59/60	58/59	65
ST-14	71/72	71/71	77
ST-15	60	55	66
ST-16	60	51	66
* - Energy Commission staff estimate			

Insert **NOISE: Figure 1** here.....

AFC Figure 5.12-2

Insert **NOISE: Figure 2** here.....

AFC Figure 5.12-3

Long-term noise measurements were conducted at three locations, as shown by **NOISE: Figure 1**. The noise measurement results are summarized by **NOISE: Table 4**.

NOISE: Table 4 – Summary of Long Term Noise Measurements

Site ID	Date	Location	Sound Level, dBA			
			L _{dn}	CNEL	Average Nighttime L ₅₀	Average Nighttime L ₉₀
LT-1	7/20-7/21/2000	NW Corner at PL	68.5	68.9	61*	60*
LT-1a	8/31-9/1/2000	Same as LT-1	65.6	65.9	58*	56*
LT-2	7/20-7/21/2000	South PL	62.0	62.4	54	52
LT-2a	8/31-9/1/2000	Same as LT-2	64.3	64.6	57	56
LT-3	8/31-9/1/2000	West PL at Break Area	66.4	66.8	58	58
LT-3a	11/13-11/14/2000	Same as LT-3	N/A	N/A	60	59

* - Estimated by Energy Commission staff after exclusion of construction noise

Based upon the noise level measurements at Site LT-2, ambient noise levels are lowest between the hours of 10:00 p.m. and 2:00 a.m. In this time period, the median noise levels (L₅₀) at Site LT-2 on July 20-21, 2000, ranged from 52 dBA to 54 dBA.

In response to a data request from the Energy Commission, additional short-term noise measurements were performed on the plant site, and at one of the nearest residences (4420 The Strand, Manhattan Beach), during nighttime hours on April 1-2, 2001. The purpose of these noise measurements was to assess the potential contribution of noise from the existing power plant to ambient noise levels in the absence of the storage tanks. **NOISE: Table 5** summarizes the noise measurement results.

NOISE: Table 5 – Summary of Nighttime Noise Measurements

Location	Sound Level, dBA		
	L _{eq}	L ₅₀	L ₉₀
Ambient Noise – with storage tanks			
Outside on deck	62	62	61
Inside house	50	50	48
Estimated Plant Noise – without storage tanks			
Outside on deck	52	52	51
Inside house	52	52	51
Estimated Cumulative Noise – without storage tanks			
Outside on deck	62	62	61
Inside house	55	54	54

The applicant also conducted frequency analyses of the noise measured at three locations, with one generating unit in operation. These data will provide the basis for a comparison of the frequency content of the existing units and the new plant, primarily to determine the presence of pure tones and potentially significant low frequency noise at the bike path. The operating unit did not produce any pure tones, nor did it produce excessive low frequency noise (ESPR 2000a, AFC Figure 5.12-4).

Because of the importance of defining the ambient noise level in implementing the LORS, the applicant conducted additional noise measurements and an extensive, detailed, noise modeling exercise, and submitted a report concerning that analysis in December 2001. This analysis summarized the above-described noise measurement programs, and then described additional noise measurements performed to describe the contributions of surf noise to ambient noise levels. In addition, the analysis assessed the factors affecting surf noise levels. The report included a new noise modeling exercise using a sophisticated noise model (Cadna/A) which accounted for variations in site topography, atmospheric effects, surf noise, and the presence or absence of the storage tanks. Finally, the report described the results of noise measurements conducted during Unit 4 shutdown and restart, to determine the effects of Unit 4 noise emissions on ambient noise levels in the project vicinity.

The December 2001 noise analysis produced the following important conclusions:

- During the quietest periods of the night, surf noise apparently constitutes the ambient noise environment in the vicinity of the residences adjacent to the south project boundary.
- Surf noise levels are lowest when wave heights are lowest, typically in late summer months.
- Noise from current Unit 4 operation has no measurable effect on ambient noise levels near the south project boundary.
- The removal of the storage tanks is expected to produce an increase in ambient noise levels of less than 2 dBA in the vicinity of the residences adjacent to the south project boundary.

Furthermore, the December 2001 noise analysis shows that it is possible to reliably measure surf noise on the project site exclusive of other influences. This offers the opportunity to provide baseline noise measurements against which to compare noise levels measured after the project is implemented. For example, it is feasible to conduct concurrent noise measurements at a reference location on the project site (to describe surf noise levels only), and at the nearest potentially affected residence, to establish a relationship between surf noise levels and ambient noise levels at the residence. After the project is implemented, it will then be possible to repeat the noise measurements at both sites during the quietest time of year, and to judge whether that relationship has been affected by the project. Specifically, it will be possible to determine whether the project has caused an increase in ambient noise levels at the nearest sensitive receptors.

IMPACTS

Noise impacts associated with the project can be created by short-term construction activities, and by normal long-term operation of the power plant.

PROJECT SPECIFIC IMPACTS — CONSTRUCTION

Community Effects

General Construction Noise

Construction noise is usually considered a temporary phenomenon. In this case, the construction period for the ESPR includes four phases: preparation of the storage tank farm area (about 30 days), demolition of the existing Units 1 and 2 (about 11 months), and construction of the new power plant generation units (18 months), and creation of a public access area as part of the tank farm area (14 months). There is likely to be some overlap in these activities, so the total construction time is expected to be 24 to 30 months. Construction and demolition of an industrial facility such as a power plant is typically noisier than permissible under usual noise ordinances. In order to allow the construction of new facilities, construction noise during certain hours is commonly exempt from enforcement by local ordinances, as discussed above.

The applicant has prepared analyses of construction noise impacts, listing the equipment to be used, schedules of use, and the predicted worst-case noise levels at the nearest noise sensitive receptors due to the construction activities in each phase.

At the nearest noise sensitive receptors, the predicted cumulative worst-case average hourly noise level during the first phase of tank farm area preparation is 67 dBA. This level is 2 dBA higher than the construction noise standard of the El Segundo Municipal Code. The purpose of this phase is to create work and storage areas at the tank farm, which will include opening access doors into the two tanks.

During the second phase, which involves demolition of Units 1 and 2 and use of the tank farm site for materials storage, the use of heavy equipment would generate cumulative worst-case average hourly noise levels in the range of 67-69 dBA. This level is 2-4 dBA higher than the construction noise standard of the El Segundo Municipal Code. This phase will include crushing of the cement from Units 1 and 2, to take place in the vicinity of Units 1 and 2.

During construction of Units 5, 6 and 7 (Phase III), the soil, sand and crushed concrete that was stored in the tanks will be returned to the main construction site for fill. The northern tank will be removed, and that area used for storage. Welding and fabrication will take place inside the south tank, and loaders and trucks will move materials. These activities are expected to produce cumulative worst-case average hourly noise levels in the range of 69-70 dBA. These levels are 4-5 dBA higher than the construction noise standard of the El Segundo Municipal Code.

In the fourth phase, the south tank will be removed, and the tank farm area will be repaved. The public access area will also be graded and landscaped. These activities

are expected to produce cumulative worst-case average hourly noise levels in the range of 69-70 dBA. These levels are 4-5 dBA higher than the construction noise standard of the El Segundo Municipal Code.

Based upon the potential noise impacts of construction and demolition noise, the Energy Commission staff has recommended the inclusion of three Conditions of Certification (**NOISE-1**, **NOISE-2**, and **NOISE-8**) to monitor and mitigate potential construction and demolition noise impacts.

Because construction activities are limited to daytime hours and certain noise levels by the proposed Conditions of Certification, and are of limited duration, potential construction noise impacts to receptors in the ESPR project area are considered to be less than significant.

Pile Driving Vibration

Conventional pile driving produces potentially significant ground-borne vibration. Although the applicant has not provided a specific analysis of potential pile driving vibration effects, it is the opinion of Energy Commission staff that pile driving in the vicinity of Units 1 and 2 will not have any significant effects on the nearest residential receptors, which are approximately 2,000 feet distant.

Steam Blows

Typically, the steam blows during construction and start-up create the loudest noise encountered during the construction phase. Steam blows are necessary after erection and assembly of the feedwater and steam systems because the piping and tubing that comprises the steam path accumulate dirt, rust, scale and construction debris such as weld spatter, dropped welding rods and the like. If the plant were to start up without thoroughly cleaning out the piping and tubing, all this debris would find its way into the steam turbine, quickly destroying the machine.

In order to prevent this, before the steam system is connected to the turbine, the steam line is temporarily routed to the atmosphere. High-pressure steam is then raised in the heat recovery steam generator (HRSG) or a temporary boiler and allowed to escape to the atmosphere through the steam piping. This flushing action, referred to as a steam blow, is effective at cleaning out the steam system. A series of short steam blows, lasting two or three minutes each, is performed several times daily over a period of two or three weeks. At the end of this procedure, the steam line is connected to the steam turbine, which is then ready for operation.

According to the applicant, un-silenced steam blow noise levels could be as high as 130 dBA at a distance of 100 feet, which would produce about 103 dBA at the nearest residence, over 2,000 feet away. The applicant has proposed to provide a temporary silencer to limit the steam blow noise level to 110 dBA at a distance of 100 feet, which would reduce the maximum noise level at the nearest residence to about 83 dBA. The applicant has further proposed to conduct steam blows only during the hours of 7:00 a.m. to 7:00 p.m. weekdays, and from 8:00 a.m. to 6:00 p.m. weekends and holidays.

Area residents and the Cities of Manhattan Beach and El Segundo have expressed significant concerns about steam blow noise, especially as it relates to the potential effects on people using the beach and bike path adjacent to the plant. Expected reactions to the high noise levels encountered in those areas could include startle and temporary hearing threshold shifts. Residents in Manhattan Beach, and the Cities of Manhattan Beach and El Segundo, have also expressed concern about steam blow noise satisfying the requirements of the El Segundo Municipal Code with respect to maximum construction noise levels as received in residential areas.

Given the significant controversy over steam blow noise, Energy Commission staff believes that steam blow noise should be mitigated to the maximum feasible extent. Alternative low-pressure steam blow technology currently exists, and is economically feasible, as demonstrated by its use for other recently approved power plant projects. Therefore staff has recommended that low-pressure steam blows be required as Condition of Certification NOISE-4.

Energy Commission staff further proposes a notification process to make neighbors aware of scheduled steam blows (see proposed Condition of Certification **NOISE-5** below).

Linear Facilities

This project includes no new linear facilities. Therefore, no significant noise effects are expected.

Offsite Facilities

This project includes new offsite facilities in the form of water, aqueous ammonia, and sewer lines, some of which will be installed under the streets of El Segundo and Manhattan Beach. The potable and reclaimed water lines will be buried in the same trench starting at about El Segundo Boulevard and Main Street, north to Grand Avenue, west on Grand, then south of Vista Del Mar Boulevard to the project site. The sewer line will be connected to an existing line about 200 feet south of the southern plant boundary. The aqueous ammonia line will be routed from the Chevron refinery under Vista Del Mar Boulevard into the plant at the northern fence line.

Potential noise effects would be primarily the result of heavy equipment use when excavating and filling the trenches. The work is expected to proceed in a linear fashion, moving from one section of pipe to another at a rate of up to several hundred feet per day. The duration of noise-producing activity in a given area would be about one week. Total construction time is expected to be about four months.

The applicant has estimated that typical heavy construction equipment used for the pipeline construction will produce noise levels of about 87-88 dBA at a distance of 50 feet.

A portion of the pipeline route is adjacent to about 1,100 linear feet of residences in El Segundo. Another portion (the sewer line) is within about 150 feet of residences in Manhattan Beach. Construction noise levels would be within the range of ambient (traffic) noise levels at the residences in El Segundo, though the exposure would be

continuous during the periods of the day when the equipment is in use. In Manhattan Beach, construction noise would also be within the range of ambient (traffic) noise levels at the residences, although most residences would be shielded by intervening buildings.

Cumulative noise levels could increase by significant amounts during this phase of construction. These increases would be perceptible, but would be insignificant if noise-generating activities are limited to daytime hours.

Based upon the potential noise impacts of construction noise, the Energy Commission staff has recommended the inclusion of three Conditions of Certification (**NOISE-1**, **NOISE-2**, and **NOISE-8**) to monitor and mitigate potential construction noise impacts.

Because construction activities are limited to daytime hours and certain noise levels by the proposed Conditions of Certification, and are of limited duration, potential construction noise impacts to receptors in the ESPR project area are considered to be less than significant.

Worker Effects

The applicant acknowledges the need to protect construction workers from noise hazards. The applicant recognizes those applicable LORS that would protect construction workers, and commits to complying with them (ESPR2000a, AFC § 5.12.2.1). To ensure that construction workers are, in fact, adequately protected, Energy Commission staff has proposed Condition of Certification **NOISE-3**.

PROJECT SPECIFIC IMPACTS — OPERATION

Community Effects

The applicant has incorporated noise reduction measures into the design of the project to ensure that there will not be a substantial increase in noise levels due to operation of the new units at the nearest residences, which are at the south project boundary in Manhattan Beach. However, removing the storage tank farm is expected to have the incidental effect of increasing ambient noise levels, even without operation of the new units. This is the result of removing the tanks, which currently serve as barriers to sound propagation between the existing Units 3 and 4, and the nearest residences.

Attaining compliance with the LORS (the El Segundo and Manhattan Beach Municipal Codes) would be consistent with the established Energy Commission policy of limiting increases in noise exposure to no more than 5 dBA, to prevent a significant increase in background noise levels.

During its operating life, the ESPR represents essentially a steady, continuous noise source day and night. Occasional short-term increases in noise levels would occur as steam relief valves open to vent pressure, or during startup or shutdown as the plant transitions to and from steady-state operation. At other times, such as when the plant is shut down for lack of dispatch or for maintenance, noise levels would decrease.

The primary noise sources anticipated from the facility include the steam turbine generator, gas turbine generators, heat recovery steam generators, transformers, boiler feed pumps, circulating water pumps, fin fan coolers and gas compressors. The noise emitted by power plants during normal operations is generally broadband, steady state in nature.

The applicant performed acoustical calculations to predict the facility noise emissions, and to develop noise mitigation measures. The calculations were based on generalized manufacturer noise data for the major equipment planned for the facility (ESPR 2000a, AFC § 5.12.1.4). The modeling was performed as an iterative process to refine noise mitigation measures and requirements for equipment noise emission factors. Specific noise mitigation measures evaluated included:

- Enclosure around the gas turbine compartments
- Noise barriers around the gas turbine generators
- Acoustic shroud around the gas turbine exhaust ducts
- Acoustic shroud around transition ductwork
- Noise barriers around boilers
- Silencers at the boiler exit stack
- Enclosures around the steam turbine package and the generator package
- Noise barriers around transformers
- Enclosures for major pumps
- Noise barriers for fin fan coolers

The mitigated operational noise level at the bike path is predicted to be 61.4 dBA. When added to the assumed ambient noise level of 59 dBA L₅₀, the cumulative noise level will be 63.4 dBA. This level is less than 5 dBA above the ambient noise level, and would be in compliance with the LORS.

The mitigated operational noise level at the southern plant boundary is predicted to be 42.2 dBA. Assuming the ambient noise level is about 52 dBA L₅₀, the cumulative noise level would remain at about 52 dBA.

Therefore, the noise due to the new generating units is not expected to have a significant noise effect.

As noted above, the removal of the storage tank farm will eliminate the noise barrier effects (shielding) currently enjoyed by the nearest residents. The most recent calculations by the applicant indicate that the cumulative noise level at the nearest residences after storage tank removal will be less than 2 dBA greater than the ambient noise level during the quietest time of the year, which is consistent with the requirements of the Manhattan Beach Municipal Code, as interpreted by the City. Energy Commission staff, in proposed Condition of Certification **NOISE-6**, has requested supplemental noise level measurements at a reference surf noise measurement location, and at one of the nearest residences, to define the ambient noise level.

The applicant has conditionally proposed to reduce the noise level produced by Unit 4 by 2 dBA. Although this measure is not proposed by Energy Commission staff as a Condition of Certification, its apparent feasibility indicates that, should the applicant's calculated noise levels not be realized in the initial project design, additional noise reduction measures will be available.

Based upon the above information, it is the opinion of the Energy Commission staff that the project will comply with the LORS.

Further, Energy Commission staff believes that no significant noise impacts are likely to occur due to the operation of the project, as mitigated. The proposed Condition of Certification **NOISE-6** would ensure that the project operation would not cause a significant increase in the ambient noise level (L_{50}) at the most-affected residence, and that noise due to the plant operations would not exceed the standards of the El Segundo and Manhattan Beach Municipal Codes.

If additional noise mitigation is required to achieve compliance with the noise standards, suitable methods may include noise-attenuating blankets or "skins" at Units 3 or 4, noise barriers at the property line, or similar measures in the proximity of the most significant noise sources.

Tonal and Intermittent Noises

One possible source of annoyance would be strong tonal noises. Tonal noises are individual sounds (such as pure tones) that, while not louder than permissible levels, stand out in sound quality. The applicant has stated that no strong tonal noises will be generated during the operation of the project.

Pressure relief valves will likely be installed on the HRSG. The applicant has not provided an estimate of the noise levels associated with the steam system vents at the nearest receptors. Emergency pressure safety valve (PSV) discharges are typically not silenced, and produce noise only under emergency conditions. Given the distance from the pressure relief valves to the nearest residential areas, their noise effects are expected to be insignificant.

To ensure that no strong tonal noises are present and that intermittent noises are mitigated, Energy Commission staff has proposed a Condition of Certification (**NOISE-6**, below), which requires the applicant to mitigate pure tones and the noise from steam relief valves.

Linear Facilities

No new off-site linear facilities are proposed as part of this project. Given the relatively small increase in power generation due to the project, the operation of the power plant is not expected to create any incremental increase in noise levels from Southern California Edison's high voltage transmission system. Noise from the transmission lines will include a corona discharge hum, which is expected to be less than 40 dBA at a distance of 40 feet of the power lines (ESPR 2000a, AFC § 5.12.2.2). However, there are no noise sensitive land uses near the switchyard or the transmission lines. As a result, no noise impacts are assumed to occur from linear facilities.

Worker Effects

The applicant recognizes the need to protect plant operating and maintenance personnel from noise hazards, and has committed to comply with applicable LORS (ESPR 2000a, AFC § 5.12.2.1). Signs would be posted in areas of the plant with noise levels exceeding 85 dBA (the level that OSHA recognizes as a threat to workers' hearing), and hearing protection would be required. The applicant would implement a comprehensive hearing conservation program. To ensure that workers are, in fact, adequately protected, Energy Commission staff has proposed a Condition of Certification (**NOISE-7**, below).

CUMULATIVE IMPACTS

Section 15130 of the *CEQA Guidelines* (Cal. Code Regs., tit. 14) requires a discussion of cumulative environmental impacts. Cumulative impacts are two or more individual impacts that, when considered together, are considerable or that compound or increase other environmental impacts. The *CEQA Guidelines* require that the discussion reflect the severity of the impacts and the likelihood of their occurrence, but need not provide as much detail as the discussion of the impacts attributable to the project alone.

Pursuant to CEQA, a cumulative impacts analysis can be performed by either 1) summarizing growth projections in an adopted general plan or in a prior certified environmental document, or 2) compiling a list of past, present, and probable future projects producing related or cumulative impacts. The second method has been utilized for the purposes of this Staff Assessment.

There are no planned projects that could contribute to cumulative noise impacts in the project study area identified in the AFC. There are industrial noise sources north of the project site which could contribute to the cumulative noise levels at receptors in that direction. In addition, traffic noise levels are significant in the Vista Del Mar Boulevard corridor. The effects of noise produced by those sources have been accounted for by the ambient noise level measurements, and the resulting noise levels are described in the noise level predictions listed above.

FACILITY CLOSURE

In the future, upon closure of the ESPR, all operational noise from the entire ESPR site would cease, and no further adverse noise impacts from operation of the ESPR would be possible. The remaining potential temporary noise source is the dismantling of the structures and equipment, and any site restoration work that may be performed. Since this noise would be similar to that caused by the original construction of the ESPR, it can be treated similarly. That is, noisy work can be performed during daytime hours, with machinery and equipment properly equipped with mufflers. Any noise LORS that are in existence would apply; applicable Conditions of Certification included in the Energy Commission Decision would also apply unless modified.

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

Energy Commission staff concludes that the ESPR will be built and operated to comply with all applicable noise laws, ordinances, regulations, and standards. Energy Commission staff further concludes that if the ESPR facility were designed as described above, and further mitigated as described below in the proposed Conditions of Certification, it is not expected to produce significant adverse noise impacts.

RECOMMENDATION

To ensure compliance with all applicable noise LORS, Energy Commission staff recommends adoption of the following proposed Conditions of Certification.

CONDITIONS OF CERTIFICATION

Some of the Conditions of Certification in this section have been changed from the PSA based on staff's efforts to standardize Conditions of Certification to the extent feasible based on recent experience in the certification and compliance process. These changes do not affect the substance of the requirements in the Condition. Other Conditions have been changed based on stipulated agreements between staff and the applicant. All of the modified Conditions are supported by the analysis outlined in the text above.

NOISE-1 At least 15 days prior to site mobilization, the project owner shall notify all residents, property owners, and business owners within one-half mile of the site, and the City of Manhattan Beach, the City of El Segundo, and L.A. County Lifeguard Headquarters, by mail and/or other effective means, of the commencement of project construction. At the same time, the project owner shall establish and disseminate a 24-hour "hotline" telephone number for use by the public to report any undesirable noise conditions associated with the construction of the project. This telephone number shall also be posted at the project site during construction in a manner visible to passersby. This telephone number shall be maintained until the project has been operational for at least one year. The telephone shall be located in an area that is likely to be staffed, and, if the telephone is not staffed 24 hours per day, the project owner shall include an automatic answering feature, with date and time stamp recording, to answer calls when the phone is unattended.

Verification: The project owner shall transmit to the CPM in the first Monthly Construction Report following site mobilization, a statement, signed by the project manager, attesting that the above notification has been performed, and describing the method of that notification. This statement shall also attest that the telephone number has been established and posted at the site.

NOISE-2 Throughout the construction and operation of the project, the project owner shall document, investigate, evaluate, and attempt to resolve all project-related noise complaints as soon as possible.

- The project owner shall establish and disseminate a 24-hour "hotline" telephone number for use by the public to report any undesirable noise conditions associated with the project. The telephone shall be located in an area that is likely to be staffed, and, if the telephone is not staffed 24 hours per day, the project owner shall include an automatic answering feature, with date and time stamp recording, to answer calls when the phone is unattended.
- The project owner shall designate a noise monitoring officer for each construction shift, and for the daytime shift after the plant is placed into service. The noise monitoring officer shall be trained in the use of a sound level meter, and shall be empowered to halt any construction activities causing or likely to cause a violation of the Conditions of Certification herein. The noise monitoring officer shall carry at all times a portable electronic device (such as telephone or pager) to receive any incoming "hotline" call.
- The noise monitoring officer shall log each noise complaint on a CPM-approved complaint form and shall attempt to resolve the complaint.
- For construction noise complaints received outside of the construction hours and days allowed as described by Condition of Certification NOISE-8, the noise monitoring officer shall take immediate steps to determine whether power plant construction is causing the noise and, if so, to reduce the noise level of that activity or take other appropriate action to remedy the complaint as quickly as possible (not to exceed one hour) in order to comply with the Conditions of Certification.
- For construction noise complaints, the noise monitoring officer shall contact the complainant within the hour, if requested by the complainant, with information on the status and resolution of the complaint.
- In the event of construction noise complaints for two consecutive periods outside of which construction is specifically allowed by NOISE-8, either from a single affected residence, from multiple residences, or businesses, the project owner shall monitor noise levels at the receptor(s) for no less than the following two consecutive periods.
- The noise monitoring officer, as appropriate, shall measure site fence-line noise levels to assure compliance.
- The project owner shall attempt to contact the person(s) making a plant operations noise complaint within 24 hours, and shall conduct an investigation to determine the source of noise related to the complaint.
- If the noise is related to plant operations, the project owner shall take all feasible measures to reduce the noise at its source as soon as possible.
- If the noise complaint is not resolved to the satisfaction of the complainant, including the time frame for resolution, the noise monitoring officer shall provide the Commission's toll free compliance telephone number (1-800-858-0784 unless otherwise specified by the CPM).
- Within 24 hours of receiving a noise complaint, the project owner shall file a copy of the Noise Complaint Resolution Form, or similar instrument approved by the CPM, with the City of El Segundo and City of Manhattan Beach, and with the CPM, documenting the complaint. If mitigation is required to resolve a complaint, and the complaint is not resolved within a 3-day period, the project owner shall submit a progress report and a proposed mitigation

schedule, subject to the approval of the CPM, to the CPM and the affected City within 5 days of receiving the complaint.

- Following resolution of the noise complaint, the project owner shall submit an updated Noise Complaint Resolution Form and a report to the CPM and the affected City documenting the complaint and the actions taken. The report shall include: a complaint summary, including final results of noise reduction efforts; and if obtainable, a signed statement by the complainant stating that the noise problem is resolved to the complainant's satisfaction.

Verification: The project owner shall provide to the CPM, in the applicable Monthly and/or Annual Compliance Report, a listing of noise complaints received in that time period, and the status of resolution of each complaint, including all those which have not yet been resolved.

NOISE-3 Prior to site mobilization, the project owner shall submit to the CPM for review and approval a noise control program. The noise control program shall be used to reduce employee exposure to high noise levels during construction and also to comply with applicable OSHA and Cal-OSHA standards.

Verification: At least 30 days prior to site mobilization, the project owner shall submit to the CPM the above referenced program for review and approval. The project owner shall make the program available to OSHA upon request.

NOISE-4 A low-pressure continuous steam blow or other equivalent low-pressure process shall be employed. Prior to site mobilization, the project owner shall submit a description of this process, with expected noise levels and projected hours of execution, to the CPM, who shall review the proposal with the objective of ensuring that the resulting noise level does not exceed the nighttime ambient hourly L_{50} value determined in NOISE-6 plus 5 decibels at the nearest residential property line. Copies of the process description and predicted noise levels shall be provided to the Cities of Manhattan Beach and El Segundo.

Verification: At least 15 days prior to any low-pressure continuous steam blow, the project owner shall submit to the CPM drawings or other information describing the steam blow process, including the noise levels expected and the projected time schedule for execution of the process.

NOISE-5 At least 15 days prior to the first steam blow(s), the project owner shall notify the Cities of El Segundo and Manhattan Beach, L.A. County Lifeguard Headquarters, and all residents, property owners and business owners within one mile of the site of the planned steam blow activity, and shall make the notification available to other area residents in an appropriate manner. The notification may be in the form of letters to the area residences, telephone calls, fliers and/or other effective means. The notification shall include a description of the purpose and nature of the steam blow(s), the proposed schedule, the expected noise levels and potential hazards associated with them, the "hotline" phone number where people register complaints, and the explanation that it is a one-time operation and not a part of normal plant operations.

Verification: Within 5 days of notifying these entities, the project owner shall send a letter to the CPM confirming that there has been appropriate notification to the

residents, property owners, Cities and businesses of the planned steam blow activities, including a description of the method(s) of that notification.

NOISE-6 The project design and implementation shall include appropriate noise mitigation measures adequate to ensure that the project will not cause resultant noise levels to exceed the ambient median noise level (L_{50}) at residential receivers by 2 decibels or more, and that the noise due to plant operations will otherwise comply with the noise standards of the El Segundo and Manhattan Beach Municipal Codes.

No new pure tone components may be introduced. No single piece of equipment shall be allowed to stand out as a source of noise that draws legitimate complaints. Steam relief valves shall be adequately muffled to preclude noise that draws legitimate complaints.

A. Determine the ambient noise level (L_{50}) at Residential Receivers. Prior to construction, the project owner shall prepare and submit to the City of El Segundo and City of Manhattan Beach for review and comment, and to the CPM for review and approval, a Pre-Construction Noise Survey Plan. This plan will indicate the survey procedure and methodology for establishing the ambient noise level at nearby residential receivers. At a minimum, the plan will include the following:

- The project owner will conduct a 7-day continuous community noise survey at a residential receptor (on 45th Street in Manhattan Beach), selected by the CPM in cooperation with the City of Manhattan Beach. Hourly L_{eq} , L_{50} and L_{90} values shall be measured.
- Existing ESGS Units 3 and 4 shall be operating normally during the course of the survey, and the levels of plant operation will be documented during the survey. The plan will establish a range of acceptable (“normal”) operating conditions suitable for the purposes of these studies.
- A simultaneous control measurement will be conducted within the project boundary. The site shall be selected to ensure that the dominant noise source will be the surf, requiring a clear line of sight to the surf. A location near the southwest project site corner is preferred to minimize the potential for noise from the existing power plant to influence the surf noise measurements. Wave height and other surf conditions, and any unusual environmental conditions occurring during the survey period shall be documented.
- For each of the days of noise data collected at each receptor, the arithmetic average median noise level (L_{50}) shall be computed for the quietest consecutive 4-hour period. The resultant average median noise levels shall then be averaged arithmetically to calculate the relationship between surf noise levels and ambient noise levels along the northern side of the El Porto Community.
- If the initial 7-day measurement data, in the judgement of the CPM in consultation with the City of Manhattan Beach, fail to demonstrate a consistent relationship of surf and ambient noise levels, the measurement will be repeated until a consistent relationship can be established.

Following approval of the Survey Plan, the project owner shall implement the survey and present the results in a Pre-Construction Noise Survey Report to the Cities of El Segundo and Manhattan Beach and to the CPM. The Report will include a discussion of the ambient noise level taking into consideration all relevant factors, such as plant operating conditions, surf and wind conditions.

- B. Conduct post-construction survey. As soon as feasible, within the time frame described below and after Units 5, 6 and 7 first achieve a sustained output of 80 percent or greater of rated capacity, the project owner shall conduct short-term survey noise measurements at monitoring sites ST-1, ST-2, ST-3 and ST-12 (as described in the AFC, Section 5.12, Figure 5.12-3, as amended May 4, 2001). In addition, the applicant shall conduct a 7-day community noise survey at the same receptor locations used for the 7-day noise measurement cited in Section A above. The post-project community noise survey shall be conducted between June 1 and September 30, using the methods described in Item A. above. The post-construction survey shall also include measurement of one-third octave band sound pressure levels at each of the above locations to ensure that no new pure-tone noise components have been introduced. If environmental conditions prevent completion of the post-construction community noise survey in a timely manner, then the survey shall be completed as soon as conditions allow.

Following the post-construction survey, the project owner shall present the results in a Post-Construction Noise Survey Report to the Cities of El Segundo and Manhattan Beach and to the CPM. The Report will include a discussion of the relationships between surf and ambient noise levels.

- C. Implement Tank Removal Noise Mitigation if Required. Mitigation measures shall be implemented to reduce noise levels to a level of compliance if the results from the post-construction noise survey at the residential receptor location indicate that the ambient noise level (L_{50}) has increased by 2 decibels or more due to facility operation, as determined by the relationship between surf and ambient noise levels obtained from the pre-construction survey.
- D. Implement Pure Tone Mitigation if Required. If a facility-related pure tone is found to be present at any of the above monitoring sites, mitigation measures shall be implemented to eliminate the pure tone. For the purpose of this condition, a pure tone is defined by the State of California's Model Community Noise Control Ordinance.
- E. Implement Plant Noise Mitigation if Required. If the results of noise measurements at ST-1, ST-2, ST-3 or ST-12 indicate that the ambient noise level has increased by more than 5 decibels due to facility operation, as compared with the baseline noise measurements conducted on July 20 and 21, 2000, the owner will implement mitigation measures to reduce the noise at those locations to comply with the Municipal Code of the City of El Segundo.

Verification:

1. Pre-Construction Survey and Determination of Ambient Noise Level.
 - a) At least 60 days prior to construction, the project owner shall provide the Pre-Construction Noise Monitoring Survey Plan to the CPM for review and approval.
 - b) Within 30 days of completion of the survey, the project owner shall provide to the CPM for review and approval the results of the pre-construction noise survey.
2. Post-construction Survey. Within 45 days after completing the post-construction surveys, the project owner shall submit a summary report of the survey to the CPM. Included in the report will be a description of any additional mitigation measures necessary to achieve compliance with the above listed noise limits, and a schedule, subject to CPM approval, for implementing these measures.
3. Mitigation Implementation. If mitigation is required, then upon completion of installation of these measures, the project owner shall submit to the CPM a summary report of a new noise survey, performed as described in paragraph B and showing compliance with this condition.

NOISE-7 Within 30 days of the project first achieving a sustained output of 80 percent or greater of rated capacity, the project owner shall conduct an occupational noise survey to identify the noise hazardous areas in the facility. The survey shall be conducted by a qualified person in accordance with the provisions of Title 8, California Code of Regulations, sections 5095-5099 (Article 105) and Title 29, Code of Federal Regulations, section 1910.95. The survey results shall be used to determine the magnitude of employee noise exposure. The project owner shall prepare a report of the survey results and, if necessary, identify proposed mitigation measures that will be employed to comply with the applicable California and federal regulations.

Verification: Within 30 days after completing the survey, the project owner shall submit the noise survey report, including proposed mitigation measures, to the CPM for review and approval. The project owner shall make the report available to OSHA and Cal-OSHA upon request.

NOISE-8 Heavy equipment operation and noisy construction or demolition work shall be restricted as described below.

Noise levels at any residential property line due to tank farm construction or demolition shall be limited to the average daytime hourly ambient L_{50} value plus 5 dBA, or 65 dBA L_{50} , whichever is higher. Haul trucks and other engine-powered equipment shall be equipped with adequate mufflers. Haul trucks shall be operated in accordance with posted speed limits. Truck engine exhaust brake use shall be limited to emergencies.

Tank Farm Area: The use of the tank farm area is divided into four phases. For each phase the following restrictions shall be observed. Construction activity outside the hours described will not be allowed in the area south of the southern tank, which shall be termed the nighttime exclusion area.

Phase I: Prepare the tank farm for use during demolition and construction: cutting openings into the sides of the tanks, use of grader, backhoe and small trucks, a few truck trips to remove material, some welding, installation of landscaping and irrigation. All demolition and construction will occur during daytime hours of 7:30 AM to 6:00 PM Monday - Friday and 9:00 AM to 6:00 PM on Saturdays. No demolition or construction shall occur on Sundays or holidays.

Phase II: Demolition period: Entering and exiting the site, hauling material. Construction activities shall avoid the southerly end of the tank farm. All construction activities will be restricted to 7:30 AM to 6:00 PM. Moreover, other than vehicles entering and exiting tanks, equipment will operate inside the tanks. During the hours 9:00 AM to 5:00 PM, the nighttime exclusion area may be accessed by passenger vehicles or pedestrians to inspect tanks. . Except as further restricted above, all demolition and construction shall occur between 7:30 AM to 6:00 PM Monday - Friday and 9:00 AM to 6:00 PM on Saturdays. No demolition or construction shall occur on Sundays or holidays.

Phase III: Construction period: Haul material into and out of the area; remove the north tank. Daytime activities will be shielded from 45th street residents by the use of the south tank as a dome and as a shield. All demolition and construction shall occur between 7:30 AM to 6:00 PM Monday - Friday and between 9:00 AM to 6:00 PM on Saturdays. No demolition or construction shall occur on Sundays or holidays.

Phase IV: Operations period: Remove the south tank, and limit the traffic on the tank farm area. During daytime only, metal cutting will be allowed from 9:00 AM to 5:00 PM Monday through Friday, except holidays. During daytime only, trucks may be used to remove tank material and to remove soil. Bulldozers, graders etc. may be used during daytime hours only to move, excavate and replace soil. All demolition and construction shall only occur between 7:30 AM and 6:00 PM Monday-Friday. No demolition or construction shall occur on Saturdays, Sundays or holidays.

Other Areas of the Project Site: The noise standards for construction and demolition occurring at the rest of the project site (with the exception of the tank farm area) shall be:

- 65 dBA hourly L_{50} at any residential receptor during the hours of 7:30 A.M. to 6:00 P.M. Monday-Friday, and 9:00 A.M. to 6:00 P.M. Saturday.
- The ambient hourly L_{50} value plus 2 dBA at any residential receptor at any other time.

Ambient noise levels shall be determined from the pre-construction survey conducted pursuant to NOISE-6.

No pure tones are allowed outside of the hours of 7:30 A.M. to 6:00 P.M. Monday-Friday, and 9:00 A.M. to 6:00 P.M. Saturday. Haul trucks and other engine-powered equipment shall be equipped with adequate mufflers. Haul trucks shall be operated in accordance with posted speed limits. Truck engine exhaust brake use shall be limited to emergencies.

Verification: The project owner shall transmit to the CPM in the first Monthly Construction Report a statement acknowledging that the above restrictions will be observed throughout the construction of the project.

NOISE-9 The project design and implementation shall ensure that demolition, construction, or operation of the power plant will not cause vibration at any sensitive receptor to exceed a peak particle velocity of 0.003 in/sec, or to cause vibration which is perceptible without use of instruments to any reasonable person of normal sensitivity.

The noise monitoring officer designated pursuant to Condition of Certification NOISE-1 shall log each construction vibration complaint on a CPM-approved complaint form and attempt to resolve the complaint. For construction vibration complaints received outside of the construction hours or days allowed as described by Condition of Certification NOISE-8, the noise monitoring officer shall take immediate steps to determine whether power plant construction is causing the vibration and, if so, to reduce the vibration level of that activity as quickly as possible (not to exceed one hour) in order to comply with the Conditions of Certification. The noise monitoring officer, as appropriate, shall measure site fence-line vibration levels to assure compliance. If the vibration complaint is not resolved to the satisfaction of the complainant, including a time frame for resolution, the noise monitoring officer shall provide the Commission's toll free compliance telephone number (1-800-858-0784, unless otherwise specified by the CPM).

In the event of construction-related vibration complaints for two consecutive periods outside of which construction is specifically allowed by NOISE-8, either from a single affected residence, from multiple residences, or businesses, the project owner shall monitor vibration at the receptor(s) for no less than the following two consecutive periods.

Within 24 hours of receiving a complaint for vibration, the project owner shall file a copy of the Noise Complaint Resolution Form, or similar instrument approved by the CPM, with the City of El Segundo and/or City of Manhattan Beach, and with the CPM. If mitigation is required to resolve a complaint, and the complaint is not resolved within a 3-day period, the project owner shall submit a progress report and a proposed mitigation schedule, subject to the approval of the CPM, to the CPM and the affected City within 5 days of receiving the complaint. The project owner shall submit an updated Noise Complaint Resolution Form to the CPM and the affected City when the mitigation is finally implemented.

Verification: The project owner shall provide, in the applicable Monthly and/or Annual Compliance Report, a listing of vibration complaints received in that time period,

and the status of resolution of each complaint, including all those which have not yet been resolved.

NOISE-10 The project owner shall, prior to site mobilization, cease the use of exterior loudspeakers except to the extent that written direction from OSHA requires their use. No non-required loudspeaker use shall be permitted.

Verification: The project owner shall transmit to the CPM in the first Monthly Construction Report a statement acknowledging that the above restrictions will be observed throughout the construction and operation of the project, along with a copy of the pertinent documentation from OSHA describing the required use of the loudspeaker system.

EXHIBIT 1 - NOISE COMPLAINT RESOLUTION FORM

El Segundo Power Redevelopment Project
(00-AFC-14)

NOISE COMPLAINT LOG NUMBER _____

Complainant's name and address:

Phone number: _____

Date complaint received: _____

Time complaint received: _____

Nature of noise complaint:

Definition of problem after investigation by plant personnel:

Date complainant first contacted: _____

Initial noise levels at 3 feet from noise source _____ dBA Date: _____

Initial noise levels at complainant's property: _____ dBA Date: _____

Final noise levels at 3 feet from noise source: _____ dBA Date: _____

Final noise levels at complainant's property: _____ dBA Date: _____

Description of corrective measures taken:

Complainant's signature: _____ Date: _____

Approximate installed cost of corrective measures: \$ _____

Date installation completed: _____

Date first letter sent to complainant: _____ (copy attached)

Date final letter sent to complainant: _____ (copy attached)

This information is certified to be correct:

Plant Manager's Signature: _____

(Attach additional pages and supporting documentation, as required).

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NOISE: APPENDIX A FUNDAMENTAL CONCEPTS OF COMMUNITY NOISE

To describe noise environments and to assess impacts on noise sensitive area, a frequency weighting measure, which simulates human perception, is customarily used. It has been found that A-weighting of sound intensities best reflects the human ear's reduced sensitivity to low frequencies and correlates well with human perceptions of the annoying aspects of noise. The A-weighted decibel scale (dBA) is cited in most noise criteria. Decibels are logarithmic units that conveniently compare the wide range of sound intensities to which the human ear is sensitive. **NOISE: Table A1** provides a description of technical terms related to noise.

Noise environments and consequences of human activities are usually well represented by an equivalent A-weighted sound level over a given time period (Leq), or by average day and night A-weighted sound levels with a nighttime weighting of 10 dBA (Ldn). Noise levels are generally considered low when ambient levels are below 45 dBA, moderate in the 45 to 60 dBA range, and high above 60 dBA. Outdoor day-night sound levels vary over 50 dBA depending on the specific type of land use. Typical Ldn values might be 35 dBA for a wilderness area, 50 dBA for a small town or wooded residential area, 65 to 75 dBA for a major metropolis downtown (e.g., San Francisco), and 80 to 85 dBA near a freeway or airport. Although people often accept the higher levels associated with very noisy urban residential and residential-commercial zones, they nevertheless are considered to be levels of noise adverse to public health.

Various environments can be characterized by noise levels that are generally considered acceptable or unacceptable. Lower levels are expected in rural or suburban areas than what would be expected for commercial or industrial zones. Nighttime ambient levels in urban environments are about seven decibels lower than the corresponding average daytime levels. The day-to-night difference in rural areas away from roads and other human activity can be considerably less. Areas with full-time human occupation that are subject to nighttime noise, which does not decrease relative to daytime levels, are often considered objectionable. Noise levels above 45 dBA at night can result in the onset of sleep interference effects (USEPA 1971). At 70 dBA, sleep interference effects become considerable.

In order to help the reader understand the concept of noise in decibels (dBA), **NOISE: Table A2** has been provided to illustrate common noises and their associated sound levels, in dBA.

**NOISE: Table A1
Definition of Some Technical Terms Related to Noise**

Terms	Definitions
Decibel, dB	A unit describing the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure, which is 20 micropascals (20 micronewtons per square meter).
Frequency, Hz	The number of complete pressure fluctuations per second above and below atmospheric pressure.
A-Weighted Sound Level, dBA	The sound pressure level in decibels as measured on a Sound Level Meter using the A-weighting filter network. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise. All sound levels in this testimony are A-weighted.
L ₁₀ , L ₅₀ , & L ₉₀	The A-weighted noise levels that are exceeded 10%, 50%, and 90% of the time, respectively, during the measurement period. L ₉₀ is generally taken as the background noise level.
Equivalent Noise Level, L _{eq}	The energy average A-weighted noise level during the Noise Level measurement period.
Community Noise Equivalent Level, CNEL	The average A-weighted noise level during a 24-hour day, obtained after addition of 4.8 decibels to levels in the evening from 7 p.m. to 10 p.m., and after addition of 10 decibels to sound levels in the night between 10 p.m. and 7 a.m.
Day-Night Level, L _{dn} or DNL	The Average A-weighted noise level during a 24-hour day, obtained after addition of 10 decibels to levels measured in the night between 10 p.m. and 7 a.m.
Ambient Noise Level	The composite of noise from all sources, near and far. The normal or existing level of environmental noise at a given location.
Intrusive Noise	That noise that intrudes over and above the existing ambient noise at a given location. The relative intrusiveness of a sound depends upon its amplitude, duration, frequency, and time of occurrence and tonal or informational content as well as the prevailing ambient noise level.

Source: California Department of Health Services 1976.

NOISE: Table A2 Typical Environmental and Industry Sound Levels			
Noise Source (at distance)	A-Weighted Sound Level in Decibels (dBA)	Noise Environment	Subjective Impression
Civil Defense Siren (100')	140-130		Pain Threshold
Jet Takeoff (200')	120		Very Loud
Very Loud Music	110	Rock Music Concert	
Pile Driver (50')	100		
Ambulance Siren (100')	90	Boiler Room	
Freight Cars (50')	85		
Pneumatic Drill (50')	80	Printing Press Kitchen with Garbage Disposal Running	Loud
Freeway (100')	70		Moderately Loud
Vacuum Cleaner (100')	60	Data Processing Center Department Store/Office	
Light Traffic (100')	50	Private Business Office	
Large Transformer (200')	40		Quiet
Soft Whisper (5')	30	Quiet Bedroom	
	20	Recording Studio	
	10		Threshold of Hearing

Source: Peterson and Gross 1974

SUBJECTIVE RESPONSE TO NOISE

The adverse effects of noise on people can be classified into three general categories:

- Subjective effects of annoyance, nuisance, dissatisfaction.
- Interference with activities such as speech, sleep, and learning.
- Physiological effects such as anxiety or hearing loss.

The sound levels associated with environmental noise, in almost every case, produce effects only in the first two categories. Workers in industrial plants can experience noise effects in the last category. There is no completely satisfactory way to measure the subjective effects of noise, or of the corresponding reactions of annoyance and dissatisfaction, primarily because of the wide variation in individual tolerance of noise.

One way to determine a person's subjective reaction to a new noise is to compare the level of the existing (background) noise, to which one has become accustomed, with the level of the new noise. In general, the more the level or the tonal variations of a new noise exceed the previously existing ambient noise level or tonal quality, the less acceptable the new noise will be, as judged by the exposed individual.

With regard to increases in A-weighted noise levels, knowledge of the following relationships (Kryter 1970) can be helpful in understanding the significance of human exposure to noise.

1. Except under special conditions, a change in sound level of one dB cannot be perceived.
2. Outside of the laboratory, a three dB change is considered a barely noticeable difference.
3. A change in level of at least five dB is required before any noticeable change in community response would be expected.
4. A ten dB change is subjectively heard as an approximate doubling in loudness and almost always causes an adverse community response.

COMBINATION OF SOUND LEVELS

People perceive both the level and frequency of sound in a non-linear way. A doubling of sound energy (for instance, from two identical automobiles passing simultaneously) creates a three dB increase (i.e., the resultant sound level is the sound level from a single passing automobile plus three dB). The rules for decibel addition used in community noise prediction are:

NOISE: Table A3 Addition of Decibel Values	
When two decibel values differ by:	Add the following amount to the larger value
0 to 1 dB	3 dB
2 to 3 dB	2 dB
4 to 9 dB	1 dB
10 dB or more	0
Figures in this table are accurate to ± 1 dB.	

Source: Thumann, Table 2.3

SOUND AND DISTANCE

Doubling the distance from a noise source reduces the sound pressure level by six dB.

Increasing the distance from a noise source ten times reduces the sound pressure level by 20 dB.

WORKER PROTECTION

OSHA noise regulations are designed to protect workers against the effects of noise exposure, and list permissible noise level exposure as a function of the amount of time to which the worker is exposed:

NOISE: Table A4
OSHA Worker Noise Exposure Standards

Duration of Noise (Hrs/day)	A-Weighted Noise Level (dBA)
8.0	90
6.0	92
4.0	95
3.0	97
2.0	100
1.5	102
1.0	105
0.5	110
0.25	115

Source: OSHA Regulation

PUBLIC HEALTH

Testimony of Obed Odoemelum, Ph.D.

INTRODUCTION

Operating the El Segundo Power Redevelopment project (or ESPR) would expose the general public and workers to combustion byproducts as well as the toxic chemicals associated with other aspects of facility operations. As detailed by the applicant (ESPR, pages 5.2-6 through 5.2-9 and page 5.2-44), and noted in the **Project Description** section, the proposed is a modification project in which two 1950s-vintage generating units (1 and 2) of the existing El Segundo Generating Station (ESGS) are replaced with three more efficient units (5, 6, and 7) for increased power generation. The existing Units 3 and 4 would continue to be operated, meaning that the project emissions of concern in this analysis would originate mainly from Units 3 and 4 together with the new Units 5, 6, and 7 and related diesel-fired fire pump engine.

The purpose of this public health analysis is to assess the project's operations to establish whether or not such increase in power generation would produce air pollutant at levels posing a significant health risk to area residents. If such a risk were to be established, staff would recommend mitigation as appropriate. The issue of possible worker impacts is addressed in the **Worker Safety and Fire Protection** section of this Staff Assessment (SA) while the health significance of exposure to the project-related electric and magnetic fields (EMF) is addressed in the **Transmission Line Safety and Nuisance** section.

Since this modification is proposed for a site with past and on-going industrial activities, the applicant, El Segundo Power II, LLC has assessed the possibility of on-site chemical contamination at levels that could pose a human health or ecological hazard in the post-modification period. This assessment was intended to determine whether specific remediation would be necessary before construction or project-related demolitions. Related findings are presented in the **Waste Management** section together with recommended waste management requirements.

The air pollutants of primary concern in this analysis are those for which no air quality standards have been established. These are known as non-criteria pollutants, which are further classified as toxic air pollutants, or air toxics when emitted into the air, or as toxic soil contaminants when encountered in the soil. These pollutants exist as volatile or semi-volatile organic compounds (VOCs), or as toxic metals. Those pollutants for which ambient air quality standards have been established are known as criteria pollutants and are emitted in much larger amounts from common sources. A project's ability to comply with these air quality standards is assessed in the **Air Quality** section by comparing operational-phase ambient concentrations with the applicable air quality standards. When any project is proposed for an area in violation of any of these standards, mitigation might be necessary to prevent significant additions to the existing levels. Since this project is proposed for an area with existing violations of specific air quality standards as noted by the applicant (ESPR 2000a, page 5.2-3) and discussed in the **Air Quality** section, such mitigation is recommended in that section.

The criteria pollutants are identified in this analysis (along with regulations for their control) because they usually contribute significantly to the total pollutant exposure in any given area. Furthermore, the same control technologies may be effective for controlling both types of pollutants when emitted from the same source. Compliance with the required control technologies is discussed in the **Air Quality** section for this project.

LAWS ORDINANCES, REGULATIONS AND STANDARDS (LORS)

FEDERAL

The Clean Air Act of 1970 (42 U.S.C., section 7401 et seq.) required establishment of ambient air quality standards to protect the public from the effects of air pollutants. These standards have been established by the United States Environmental Protection Agency (EPA) for the major criteria pollutants: nitrogen oxides (NO_x), ozone, sulfur dioxide, carbon monoxide, sulfates, lead, and particulate matter with a diameter of 10 micron or less (PM₁₀).

STATE

California Health and Safety Code section 39606 requires the California Air Resources Board (ARB) to establish California's ambient air quality standards to reflect the California-specific conditions influencing its air quality. Such standards have been established by the ARB for ozone, carbon monoxide, sulfur dioxide, PM₁₀, lead, hydrogen sulfide, vinyl chloride and nitrogen dioxide. The California standards are listed together with the corresponding federal standards in the **Air Quality** section.

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

The California Health and Safety Code section 39650 et seq. mandates that the California Environmental Protection Agency (Cal-EPA) establish safe exposure limits for toxic, non-criteria air pollutants and identify the best available methods for controlling their emission. These laws also require that the new source review rules for each air quality management district (AQMD or Air District) include regulations establishing procedures to control the emission of these pollutants. The toxic emissions from natural gas combustion are listed in ARB's April 11, 1996 California Toxic Emissions Factors (CATEF) database for natural gas-fired combustion turbines to allow for uniform assessment as emitted from all combustion sources in the state. Cal-EPA has developed specific cancer potency estimates for assessing any cancer risk they may pose at specific exposure levels. For toxic air pollutants that do not cause cancer, Cal-EPA established specific no-effects levels (known as reference exposure levels or RELs) for assessing the likelihood of producing health effects at specific exposure levels. Such health effects would be considered significant only when exposure

exceeds these reference levels. The Energy Commission staff (staff) uses these Cal-EPA potency estimates and reference exposure values in its health risk analyses.

California Health and Safety Code section 44300 et seq. requires facilities, which emit large quantities of criteria pollutants and any amount of non-criteria pollutants to provide the local air district an inventory of toxic emissions. Operators of such facilities may also be required to prepare a quantitative health risk assessment to address the potential health risks involved. The ARB ensures statewide implementation of these requirements through the state's Air Districts.

The California Public Resources Code Section 2550 (a); 20 California Code of Regulations Sections 1752, 2300-2309 and Division 2, Chapter 5, Article 1, Appendix B, Part (1) California Energy Commission, whose requirements include a quantitative health risk assessment for any pollution sources for which a permit is sought from the Commission.

LOCAL

Local implementation of provisions of the Health and Safety Code section 44300 in the project area is ensured by the area's Air District, the South Coast Air Quality Management District (SCAQMD) which established Rule 1401 in this regard. The applicant has complied with the related Air District requirements by submitting a Health Risk Assessment as part of their permit application.

SETTING

As detailed in the information from the applicant, (ESPR 2000a pages 3.2-1, 3.4-2 5.9-2 through 5.9-4, 5.13-1 and 5.18-1) the proposed project will be located on a 5.5-acre portion of the ESGS, which occupies a site of approximately 33 acres in the City of El Segundo. The site is bordered on the east by a road, Vista Del Mar, by 45th Street in the City of Manhattan Beach to the south, by Santa Monica Bay on the west and the Chevron Marine Terminal to the north. The immediate surroundings are zoned for industry, commercial establishment, residential housing and open spaces.

The applicant (ESPR 2000a, pages 6.16-1 and 6.16-26) has identified specific locations with sensitive receptors within a two-mile radius from the project site. Sensitive receptors are individuals who may be more susceptible than the general population to the impacts of environmental pollutants. These individuals include children, pregnant women, the elderly, and the chronically ill. They may be found in relatively small numbers in individual residences, or in relatively large numbers in specific establishments or institutions such as schools, daycare centers, retirement homes, hospitals, or recreation centers. Exposure limits against the non-cancer impacts of all environmental pollutants are established to include safety margins considered adequate to protect against health symptoms among both the general public and sensitive individuals. These margins of safety are established from health effects information as available during the standard setting period. As more becomes known through further studies, each standard could be revised to ensure the health protection at issue. Such sensitivity to non-cancer impacts does not necessarily apply to cancer-causing effects whose underlying biological mechanisms are different. Staff requires identification of

such sensitive receptor locations for further insight into the nature of the population potentially exposed to the toxic pollutants at issue. Such information is not necessarily intended for specific mitigation. The health significance of above-limit exposures is assessed through established methods, which differ for the criteria and non-criteria pollutants.

METHOD OF ASSESSING THE POTENTIAL IMPACTS OF TOXIC AIR POLLUTANTS

Any toxic air pollution-related health risks from operating the proposed ESGS modification would mainly be associated with emissions from its previously noted natural gas-fired turbines, boilers and supporting diesel-fueled fire pump. For the surrounding population, the potential for the cancer and non-cancer effects of such emissions is assessed from exposure estimates obtained for the identified project sources from both air dispersion and exposure modeling. For the pollutants at issue, the potential for cancer is considered particularly important because of the present assumption by most scientists that there is no “safe” exposure to a carcinogen, meaning that every carcinogenic exposure is capable of a theoretical cancer risk. This non-threshold concept (as applied to carcinogenic effects) differs from present assumptions about non-cancer effects, which are assumed to result only after exposure above levels that overwhelm the body’s ability to protect against such impacts. The procedure for such impact assessment is known as a health risk assessment, which consists of the steps listed below:

- A hazard identification step in which each pollutant of concern is identified along with possible health effects;
- A dose-response assessment step in which the relation between the magnitude of exposure and the probability of effects is established;
- An exposure assessment step in which the possible extent of pollutant exposures from a project is established for all possible pathways by dispersion modeling; and
- A risk characterization step in which the nature and the magnitude of the possible human health risk is assessed.

Health Effects Assessed

The types of air toxics-related health impacts of concern in this analysis are those that can result shortly after exposure or following long-term (or chronic) exposure. Those from short-term exposure are known as acute effects and generally result from exposure at relatively high levels. Some examples of pollution-induced non-cancer health effects from acute or chronic exposure include headaches, dizziness, coughing, nausea, asthma, skin rash, and irritation of any part of the body such as the eyes, throat and skin. According to present understanding, only those effects from chronic exposure are capable of causing cancer whose risk of manifestation increases with the level and duration of such exposure.

For the proposed or similar gas-fired facilities, high-level toxic exposures (at levels capable of acute effects) could occur only during major accidents, not during routine operations when emissions are much lower. Compliance with Air District-mandated emission control technologies is reflected by the incremental cancer and non-cancer risk estimates calculated for toxic pollutants. These risk estimates are calculated the

same way for the proposed and other gas-fired power plant projects. Therefore, they can be used, despite underlying scientific uncertainties, to compare similar projects for compliance with the requirements for use of the best emission control technologies as currently identified by the ARB.

Estimating the Risk of Non-Cancer Effects

The method used by regulatory agencies to numerically assess the likelihood of acute or chronic impacts of air toxics or soil contaminants is the hazard index method. In this approach, a hazard index is calculated as a numerical representation of the likelihood of significant health impacts at the exposure levels expected for the source being considered. This index is calculated by dividing the exposure estimate by the applicable reference exposure level. After calculating the hazard indices for the individual pollutants, these indices are added together for all those that affect the same part of the body or target organ, to obtain a total hazard index for the source. Total hazard indices of 1.0 or less are regarded as indicating a potential lack of significant health impacts while an index of more than 1.0 may indicate a significant potential for the non-cancer acute or chronic effects being considered.

Estimating the Risk of Cancer

Since cancer is currently considered possible from every exposure to a carcinogen, staff considers the risk of cancer manifestation as more sensitive than the risk of non-cancer effects for assessing the environmental acceptability of a source of both carcinogens and non-carcinogens. This accounts for the prominence of theoretical cancer risk estimates in the environmental risk assessment process.

For any source of specific concern, the risk of operations-related cancer is obtained by multiplying the exposure estimate by the potency factors for the individual carcinogens to be emitted. These potency factors are numerical values established to represent the cancer-causing potential of one carcinogen as compared to the others. After calculating these individual risk values, they are added together to obtain the total incremental cancer risk from operations. Given the previously noted conservatism in the this risk calculation process, these numerical estimates are best regarded as only representing the upper bounds on the cancer risk at issue. They should not be presented as the real risk, which will likely be lower and could indeed be zero. Since the same calculation process is used in all cases, these risk numbers are best used in practice for (a) setting mitigation priorities, (b) choosing between competing control technologies, and (c) assessing the effectiveness of control measures. The significance of any specific estimates as indicators of a real cancer hazard is assessed according to specific evaluative criteria.

STAFF'S SIGNIFICANCE CRITERIA

Various state and federal agencies specify different cancer risk levels as levels of significance with regard to specific sources. For example, a risk of 10 in a million is mostly considered under the Air Toxics "Hot Spots" (AB 2588) and the Proposition 65 programs as significant, and therefore, used as a threshold for public notification in cases of air toxics emissions from existing sources. The South Coast Air Quality Management District (SCAQMD) considers a risk of 25 in a million as the significance criterion in this regard. For new or modified sources with best available toxics control

technology (TBACT), the District's significance criterion is 10 in a million. For those without such controls the criterion is 1 in a million.

For the proposed and similar projects, the Energy Commission staff considers a potential cancer risk of one in a million as the de minimis level, which is the level below which the related exposure is considered negligible (meaning that project operation is not expected to result in any increase in cancer). For estimates that reflect a risk above this level, any recommended action would depend on the magnitude of the estimate in question. However, specific mitigation would be recommended only when the possible risk is specified as more than 10 in a million. This regulatory approach is intended in light of current knowledge to limit the rate of addition to the already high (1 in 4, 25 %, or 250,000 in a million) background cancer risk of the average individual.

While the carcinogenic property of several environmental pollutants is well established, the causes of most of human cancers remain largely unknown. What has become clearer to scientists is that environmental pollution is responsible for only a small fraction of human cancers in general. This fraction, according to the South Coast Air Quality Management district (2000, page 2), represents only about two percent of cancer cases. The present risk-based regulatory approach is, in practice, intended to avoid all avoidable human carcinogenic exposure, especially when such exposures are not within the individual's control, as would be true of the emissions from ESPR and other sources.

For non-carcinogenic pollutants, staff considers significant health impacts to be unlikely when the total hazard index is 1.0 or less. If more than 1.0, staff would regard the related emissions as potentially significant from an environmental health perspective. It would not automatically call for specific mitigation whose recommendation would depend on magnitude of the index value involved.

IMPACTS

PROJECT SPECIFIC IMPACTS

The health impacts of the toxic air contaminants of primary concern in this analysis can be assessed separately as construction-phase impacts and operational-phase impacts.

Construction Phase Impacts

The results of the applicant's site contamination assessments (ESPR 2000a, Appendix T) established that there are specific pockets of soil contamination from past industrial activities within and outside the ESGS site. It also established the site's underground water to be contaminated with contaminants from off site sources the most important of which is the nearby Chevron refinery. Past site investigations were listed in the Site Assessment report as related to past assessments for specific mitigation. Related ground water monitoring and mitigation are continuing in compliance with specific requirements of the Los Angeles Regional Water Quality Control Board. The procedure for the safe clean up and removal of any discovered contamination is discussed in the **Waste Management** section with respect to the demolition and construction phases of the proposed project. Implementing conditions for certification are also recommended in

that section. Staff expects compliance to protect against significant health impacts on construction workers or the general public.

The other possibility of impacts on construction workers would derive from exposure to the toxic emissions from the vehicles and equipment to be used. The applicant has identified the construction-phase vehicles and equipment to be used along with expected emission rates for the relatively short (21-month) construction period of specific concern (ESPR 2000a, Appendix I.2-1, pages 1-16 through 1-28). The applicant also modeled and presented the concentrations of the criteria pollutants and diesel emissions of potential health significance in this regard (ESPR 200a, Appendix 1.2, pages 1-7 through 1-14). Staff is in agreement with the applicant's impact assessment approach as more fully discussed in the **Air Quality** section along with the applicant's mitigation plan and staff's recommended mitigation.

One of these staff-recommended mitigation measures (specified in the **Air Quality** section as **AQ-C2**), is considered adequate by staff for minimizing the impacts of both criteria and non-criteria pollutants whose maximum levels were estimated by the applicant to occur at locations around the ESGS property boundaries. All construction- and operations-related wastes will be managed to prevent significant health or environmental impacts as detailed by the applicant (ESPR 2000a, page 5.14 –26 through 5.14-28). Implementing conditions of certification are recommended in the **Waste Management** section.

Direct Operational Impacts

As noted in a report by the South Coast AQMD (2000, page 6), one characteristic that distinguishes the air toxics of primary concern in this analysis from the criteria pollutants (some of which are subject to further reactions in the course of dispersion), is that their impacts tend to be highest in close proximity to their sources and quickly drop off with distance from such sources. This means that the proposed project's air toxics levels would be highest immediately around it and decrease rapidly as one moves into the surrounding area, away from the points of maximum impacts.

The applicant's estimates of ESPR's contributions to the area's risk of cancer and non-cancer effects were obtained from a health risk assessment conducted according to procedures specified in the 1993 California Air Pollution Control Officer's Association (CAPCOA) guidelines (ESPR 2000a, pages 5.16-1). The results from this assessment were provided to staff along with documentation of the assumptions used (ESPR 2000a, pages 5.2-51 through 5.2-64, 5.16-3 through 5.16-11 and Appendix 1.4). Such documentation was provided with respect to the following:

- Pollutants considered;
- Emission levels assumed for the pollutants involved;
- Dispersion modeling used to estimate potential exposure levels;
- Exposure pathways considered;
- The cancer risk estimation process;
- Hazard index calculation; and
- Characterization of project-related risk estimates.

Staff has found these assumptions to be acceptable and concur with the applicant's findings with regard to the numerical public health risk estimates expressed either in terms of the hazard index for each non-carcinogenic pollutant, or a cancer risk for estimated levels of the carcinogenic pollutants. These analyses were conducted to establish the maximum potential for acute and chronic effects on body systems such as the liver, central nervous system, the immune system, kidneys, the reproductive system, the skin and the respiratory system.

The following toxic air pollutants were considered with respect to non-cancer effects: acetaldehyde, acrolein, ammonia, benzene, 1,3 butadiene, ethylbenzene, formaldehyde, naphthalene, polycyclic aromatic hydrocarbons (PAHs), propylene oxide, toluene, and xylenes. The following were considered with regard to a possible cancer risk: acetaldehyde, benzene, 1,3 butadiene, chrysene, formaldehyde, PAHs and propylene oxide.

A maximum incremental cancer risk of 0.94 was calculated for the maximally exposed individual for a location approximately 2.1 kilometers east-southeast of the project site. This number is below staff's significance criterion of 1.0, suggesting a lack of a material cancer risk to any individual within the project area. The maximum chronic hazard index of 0.02 was calculated for the individual at the location identified with respect to the maximum cancer risk. This is significantly below staff's significance criterion of 1.0, meaning that the project's emissions would be unlikely to significantly add to area's health status related to chronic non-cancer effects. A maximum acute hazard index of 0.01 was calculated for the same location, suggesting a potential lack of significant modification-related impacts of an acute nature. The values for all sensitive receptor locations are much lower.

CUMULATIVE IMPACTS

When toxic pollutants are emitted from multiple sources within a given area, the cumulative, or additive, impacts of such emissions could, in concept, lead to significant health impacts within the population, even when such pollutants are emitted at insignificant levels from the individual sources involved. Analyses of such emissions have shown, however, that the peak impacts of such toxic pollutants are normally localized within relatively short distances from the source. Toxic pollutant levels beyond the point of maximum impact quickly fall within ambient background levels. This modification project is proposed for a site already committed to power generation and related industrial and commercial activities. Given the low cancer and non-cancer risks to be associated with the proposed modification project, staff does not expect its operations to contribute significantly to any area toxic exposure of a cumulative nature.

ENVIRONMENTAL JUSTICE

The 1990 census data and 2000 population estimates for minority and non-minority populations within a six-mile radius of the proposed project are presented in **Socioeconomics Tables 5 and 6** of this staff analysis. Geographic distribution on the basis of race and ethnicity is presented in **Socioeconomics Figure 1**. Staff has established from the presented data that the minority population within the six-mile impact area of environmental justice-related focus to be between 44.9 percent and 57.6

percent, pointing to a relatively high percentage of minorities in this impact zone. As established by the Socioeconomics, staff and presented in **Socioeconomics Table 7**, only 10.67 percent of the population in this six-mile zone lives below the poverty threshold, meaning that there would be no human differential pollutant exposures on the basis of economic status. Since staff has established that no significant health impacts would result anywhere in the project area from the emission of the pollutants considered in this **Public Health** analysis, the issue of environmental justice would not arise in spite of potential exposures in the identified areas of relatively high minority populations. Issues of environmental justice are of potential concern only in cases of exposures of potential health significance.

CONCLUSIONS AND RECOMMENDATIONS

Staff has determined that the construction and operation of the proposed ESPR project would be unlikely to significantly affect the health of area residents. The cancer and non-cancer risks from the project's electricity generation would be at levels reflecting controls using the technology established by the ARB as most effective for this and similar facilities.

Since the operation of the ESPR project would allow for more efficient power generation without significant health impacts, staff recommends approval with respect to the toxic pollutants considered in this analysis. The conditions for ensuring compliance with all applicable air quality standards are specified in the **Air Quality** section for the area's problem criteria pollutants. No Public Health Conditions of Certification are recommended.

REFERENCES

- California Air Resources Board (ARB) 1996. California Toxic Emissions Factors (CATEF) Database for Natural Gas-Fired Combustion Turbine Cogeneration.
- California Air Pollution Control Officers Association (CAPCOA) 1993. Air Toxics "Hot Spots" Program, Revised 1992 Risk Assessment Guidelines. Prepared by the Toxics Committee, October 1993.
- ESPR (El Segundo Power Redevelopment Project) 2000a. Application for Certification, Volumes 1 through IV, El Segundo Redevelopment Power Redevelopment Project. Submitted to the California Energy Commission on December 20, 2000.
- South Coast Air Quality Management District 2000. An Air Toxics Control Plan for the Next Ten Years. March 2000. South Coast Air Quality Management District publication.

SOCIOECONOMIC RESOURCES

Testimony of Michael Fajans and Amanda Stennick

INTRODUCTION

This socioeconomic impact analysis evaluates the effects of potential short-term and long-term project-related population changes on local schools, medical and protective services, as well as the fiscal and physical capability of local governmental agencies to meet the needs of project-related changes in population. This analysis discusses the potential direct and cumulative impacts of the proposed El Segundo Power Redevelopment Project (ESPR) on local communities, community resources, and public services.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS (LORS)

FEDERAL

Executive Order 12898, "Federal Actions to address Environmental Justice (EJ) in Minority Populations and Low-Income Populations," focuses federal attention on the environment and human health conditions of minority communities and calls on agencies to achieve environmental justice as part of this mission. The order requires the US Environmental Protection Agency (EPA) and all other federal agencies (as well as state agencies receiving federal funds) to develop strategies to address this issue. The agencies are required to identify and address any disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority and/or low-income populations.

Civil Rights Act of 1964, Public Law 88-352, 78 Stat.241 (Codified as amended in scattered sections of 42 U.S.C.) Title VI of the Civil Rights Act prohibits discrimination on the basis of race, color, or national programs in all programs or activities receiving federal financial assistance.

STATE

California Government Code, Sections 65996-65997

As amended by SB 50 (Stats. 1998, ch. 407, sec.23), these sections state that public agencies may not impose fees, charges, or other financial requirements to offset the cost for school facilities.

14 California Code of Regulations, Section 15131

The California Code of Regulations title 14, division 6, chapter 3, sections 15000 through 15387 provide the guidelines for implementation of the California Environmental Quality Act (CEQA). Section 15131 provides direction for the evaluation of a proposed project's potential economic and social effects, including:

- economic or social effects of a project shall not be treated as significant effects on the environment;

- economic or social factors of a project may be used to determine the significance of physical changes caused by the project; and
- economic, social and particularly housing factors shall be considered by public agencies together with technological and environmental factors in deciding whether changes in a project are feasible to reduce and or avoid the significant effects on the environment.

LOCAL

The City of El Segundo has development impact fees based on the gross square foot of building area for fire, police, and library services. These fees are assessed for all development projects with the city.

SETTING

PROJECT LOCATION

The proposed project is at the site of the existing El Segundo Generating Station (ESGS) Power Plant in the City of El Segundo, California. The project site is in the western edge of town, between Vista Del Mar and the shore of Santa Monica Bay. For a more complete description of the location, please refer to the **Project Description** section of this document and the facility location section of the Application for Certification (ESPR 2000a). The study area for socioeconomics as defined in the AFC includes all of Los Angeles County in terms of labor issues and a considerably smaller area within a six-mile radius of the project in terms of environmental justice and potential community impacts.

DEMOGRAPHIC CHARACTERISTICS

Socioeconomics Table 1 shows population growth patterns for Los Angeles County and the cities of El Segundo and Manhattan Beach, which contain and are adjacent to the proposed project, respectively. Los Angeles County has a very large population and has grown for many years. According to census data, population grew by 1.4 million between 1980 and 1990, and at a slower rate, 600,000 from 1990 to 2000. According to the Southern California Association of Governments forecasts (SCAG), the County population will grow by more than a million residents in each of the next two decades. As relatively central communities that were effectively built out by 1980, population growth rates in El Segundo and Manhattan Beach have been more gradual than that of the county.

Socioeconomics Table 1

Population Trends

	1980	1990	2000	2010	2020
Los Angeles County	7,477,421	8,901,987	9,519,338	10,868,900 ¹	12,249,100 ¹
City of El Segundo	13,750	15,223	16,033	18,610 ²	N.A.
City of Manhattan Beach	31,350	32,063	33,852	N.A.	N.A.
Source: U.S. Census 1980-2000, except (1) SCAG Forecasts and (2) El Segundo General Plan					

EMPLOYMENT AND ECONOMIC CHARACTERISTICS

Leading industrial categories in Los Angeles County are services, with 33 percent of all jobs, trade with 22 percent of all jobs, manufacturing with 15 percent, and government with 14.5 percent. While construction, at 3.2 percent, does not represent a major proportion, 133,000 workers, including approximately 10,000 workers in heavy construction, and 90,000 in special trades, represents a large substantial labor force for project construction. **Socioeconomics Table 2** shows the distribution of employment by industrial sector for Los Angeles County. According to SCAG estimates, Los Angeles County employment grew by 7.5 percent from 1994 to 2000.

Socioeconomics Table 2.
Employment By Industry: January 2001

Sector	Los Angeles County
Agriculture/mining	11,100
Construction	132,800
Manufacturing	626,000
Transportation/Public Utilities	246,100
Trade	909,000
Finance/Insurance Real Estate	232,900
Services	1,370,000
Government	594,500
Total	4,629,500
Sources: California EDD, February 2001	
Note: employment by place of work, excludes self-employed	

While El Segundo only has about 10,000 employed residents, there are approximately 100,000 persons employed in the City, with the manufacturing sector responsible for about 70 percent of the jobs. Aerospace and technology firms predominate, but the large Chevron refinery is the most land expansive land use in the City. Airport related offices, hotels, and services are also a significant economic factor in El Segundo.

The existing ESPR employs 51 people (ESPR 2000a). Businesses and industrial uses near the project site include the Chevron refinery, Los Angeles Department of Water and Power's Scattergood plant, the Hyperion Sewage Treatment facility, and a service station at Vista Del Mar and 45th.

Housing

As of January 2000, Los Angeles County had 3,272,000 housing units, including 180,000 vacant units, a 5.5 percent vacancy factor (DOF). El Segundo had a housing stock of 7,362 units, and a 5.8 percent vacancy rate. Of the El Segundo housing stock, 47 percent were single-family units, 12 percent were in buildings with two-four units, and 41 percent were in buildings with five or more units. Manhattan Beach had 15,293 units in January 2000, including 74 percent single-family units. Vacancy rate was 4.8 percent. Neither El Segundo nor Manhattan Beach has a significant supply of mobile homes. According to 1990 estimates, El Segundo had an inventory of 1,400 hotel and motel rooms (El Segundo General Plan, page 2-10).

Schools

The El Segundo Unified School District provides K-12 education for the community. The closest school is El Segundo High School, at 640 Main Street, approximately one mile northeast of the project site. Elementary and middle schools are about 1.5 miles from the site. Manhattan Beach has a separate school district, as do many of the surrounding communities.

Utilities, emergency, and other services

Southern California Gas provides natural gas to the project site and the new plant will replace an existing one. No expansion of the natural gas service to the site will be necessary. Southern California Edison provides electricity to the site and community. The primary local telephone provider is Pacific Bell.

The City of El Segundo provides water and sewer service within the city limits, and will provide potable water to the project. Sanitary sewer discharge from the existing plant is to the sewer system operated by the City of Manhattan Beach. Reclaimed water will be acquired from the West Basin Municipal Water District, and the applicant proposes to continue to use cooling water from Santa Monica Bay through the existing intake structure servicing the site.

Fire protection is provided by the El Segundo Fire Department, which has 54 firefighters and paramedics operating from two fire stations. The closest station, # 1, normally has 10 staff on duty per shift. Response time to the site is approximately three to five minutes (AFC, page 5.10-6). With a major refinery in town, the El Segundo Fire Department has an environmental safety division that coordinates with local industries to develop emergency response plans. Manhattan Beach Fire Department is also available via mutual assistance.

Police protection is provided by the El Segundo Police Department, with 69 authorized sworn officers plus a support staff. On-duty patrol staff ranges from three to eight officers. Response time to the project site is under four minutes (Evanski 2001). The Manhattan Beach Police Department is of comparable size and will provide mutual aid if required.

The closest hospital with full emergency services is the Robert F. Kennedy Medical Center in Hawthorne, approximately four miles northeast of the site. There are industrial medical clinics in El Segundo and several other medical centers five to 10 miles from the project site.

Fiscal and Financial

The existing El Segundo Generating Station is a significant fiscal factor for the City of El Segundo, paying both property taxes and natural gas franchise fees that are substantial revenue sources for the City. According to estimated value, the current plant pays approximately \$1 million annually in property taxes, of which the largest amount (48 percent) goes to schools and colleges, 12 percent goes to the County general fund and approximately nine percent, or \$90,000 would go to the City of El Segundo. Annual natural gas franchise or usage fees are also paid to the City.

IMPACTS

PROJECT-SPECIFIC IMPACTS

Staff reviewed the El Segundo Power Redevelopment Project Application (00-AFC-14) for Certification, dated December 2000 and the responses to data requests dated March 7 and April 9, 2001 (ESPR 2000l & 2000r). The applicant used appropriate public databases in the analysis contained in the AFC. Staff's analysis is based on verification of the information in the AFC and independent research.

Employment

Construction will occur over a 20-month period. The peak construction labor requirement for the power plant and associated pipeline is estimated at 422 workers, and is expected to occur during the 11th and 12th months of construction. The number of workers is expected to exceed 300 workers for eight months and exceed 200 workers for a 13-month period, months four through 16 of the process (AFC, page 5.10-18 and -19). **Socioeconomics Table 3** shows the distribution of workers by craft over the construction effort. The primary task for the first 4 to 6 months would be demolition of elements of the existing plant that will be replaced. This is programmed to occur on a 2-shift seven-day a week basis (AFC, page 5.10-16).

Los Angeles County has a large construction labor force with an ongoing demand for their services, including major public works and private projects. As a result, there is a supply of workers in the trades required to construct the plant. Employment of up to 422 construction workers at the site would not result in any problems with labor availability for other construction projects.

The permanent employment associated with the proposed project (53 workers) would include two additional employees. This will not have a significant impact on the Los Angeles County labor force.

Housing

As stated previously, construction of the proposed project is not expected to result in workers moving to the area for construction or permanent jobs. However, if for some reason a few workers did temporarily relocate, there was a housing vacancy rate of 4 to 6 percent in El Segundo, Hawthorne, and other nearby cities in 2000 (DOF 2001). Los Angeles County is also a dynamic community with constant movement and relocation of population, so there is a turnover of housing supply on a constant basis. Staff does not expect any significant impact on housing from the construction of the ESPR.

Schools

Temporary workers are not expected to move to and/or bring families to El Segundo or nearby communities during the construction period. Thus, there is not expected to be any impact on the need for school facilities. One-time school impact fees may be assessed once plans are submitted to the El Segundo Unified School District (AFC, page 5.10-27).

Public Finance and Fiscal

Construction of the proposed project will generate one-time sales tax receipts. Because the majority of supplies and equipment will be purchased outside of the City of El Segundo and Los Angeles and Orange Counties, limited local sales tax will be generated by the project. According to the applicant's estimates, about \$2 to 3 million worth of material and equipment would be purchased locally. Construction payroll is estimated to be about \$60 to 65 million. On-going operational payroll is projected at approximately \$1.6 million (AFC, page 5.10-21). Thus, the project will result in both one-time and ongoing economic benefits to local businesses.

The existing ESGS yields approximately \$90,000 in annual property tax to the City of El Segundo and a total of \$1 million to all agencies in 1999, based on an assessed value of approximately \$100 million. The assessed value of the redeveloped El Segundo Generating Station is estimated to be \$350-400 million (AFC, page 5.10-21). Based on the expectation that approximately \$250 million of improvements will represent net gain in assessable value (subtracting old elements that will be removed), the City of El Segundo will receive \$227,000 annually in additional property tax revenue, the County General Fund \$300,000, and the Schools will receive \$1.2 million additional annually (**Socioeconomics Table 4**). Franchise fees to El Segundo for natural gas would increase by some unknown amount, depending on the rate and the proportion of time the new units are on-line, which is expected to be higher than for the current units. Please note that the data in **Socioeconomics Table 4** was generated prior to the signing of AB 81 and the amount of property tax collected on an annual basis will be greater than that estimated here.

Socioeconomics Table 3
ESPR Construction Staffing Schedule

	Month of construction																			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Craft	Number of workers																			
Boilermakers					8	11	24	26	31	31	31	28	26	24	15	15	5	5	4	4
Bricklayers & masons			1	1	3	5	3	3	3	2	2	1	1	1	1	1	1	1	1	
Carpenters	12	15	28	40	50	64	39	42	38	37	32	28	25	23	18	15	10	5	5	4
Electricians	4	4	13	13	24	20	24	34	37	42	49	54	55	52	44	33	26	13	8	6
Insulation workers										5	10	17	19	27	27	25	25	9	8	6
Ironworkers	3	8	11	19	24	21	53	36	39	36	33	26	21	15	13	10	10	5	5	
Laborers	16	23	38	48	54	64	37	40	49	47	47	44	37	29	29	21	18	10	8	6
Millwrights				5	5	12	7	10	14	14	16	13	13	10	10	9	9	4	4	2
Operating Engineers	4	7	11	9	9	13	13	16	19	24	25	21	19	15	14	12	8	5	3	2
Plasterers								1	1	3	3	5	4	5	2	2				
Painters								1	1	3	3	7	4	5	5	5	5	5	4	2
Pipefitters	4	9	16	20	31	31	40	53	56	89	95	103	102	81	72	30	27	24	15	3
Sheetmetal Workers									3	5	8	10	10	13	15	16	14	13	5	2
Sprinkler-fitters								1	1	1	1	2	3	5	9	8	8	5	1	
Surveyors	4	4	4	7	7	9	6	6	6	6	6	6	4	4	3	3	1	1		
Teamsters	2	2	2	2	2	2	2	2	4	8	8	6	2	2	2	2	1	1	1	1
Manual staff subtotal	49	72	124	164	217	252	248	271	302	353	369	371	345	311	279	207	168	106	72	38
Contractor staff	6	14	24	37	48	48	36	38	47	49	53	51	47	44	41	34	30	13	11	6
Total On-site	55	86	148	201	265	300	284	309	349	402	422	422	392	355	320	241	198	119	83	44

Source: AFC, pages 5.10-18,19.

Under a law recently signed by the Governor, AB 81, the responsibility for property tax assessment of the ESPR property and other large power plant properties will shift from the County Assessor to the State Board of Equalization (BOE) by making them "state assessed properties." This will require annual reassessment at fair market value, and provide that property tax collected be distributed exclusively to the taxing jurisdictions within the Tax Rate Area in which the facility is located. (A "Tax Rate Area" is a grouping of properties within a county wherein each parcel is subject to the taxing powers of the same combination of taxing agencies). While AB 81 could substantially increase total property tax revenue derived from the ESPR over its lifespan, local governments, schools and other special districts in the ESPR Tax Rate Area will continue to receive the property tax revenue from the property at the same percentage of the total that they currently receive from property that is locally assessed by the County Assessor in that same Tax Rate Area.

The BOE has amended its Rule 905 (Assessment of Electric Generation Facilities) to provide that, as of January 1, 2003, and commencing with the lien date for the 2003-04 fiscal year, electric generation facilities 50 megawatts or larger, owned or used by an electrical corporation, as defined in the Public Utilities Code, will be assessed by the State. Certain small qualifying facilities and qualifying cogeneration facilities are excluded.

**Socioeconomics Table 4:
Estimated Incremental Property Tax for El Segundo Generating Station
Project**

Taxing Jurisdiction	Approximate share of tax increment	Approximate incremental revenue
City of El Segundo	9.1%	\$227,500
County General Fund	11.9%	\$297,500
Schools	47.7%	\$1,192,500
Special Districts	12.4%	\$310,000
Redevelopment Agencies	18.1%	\$452,500
Others	.8%	\$20,000
Total	100.0%	\$2,500,000
Source: Estimates based on applicants projections of property value and Los Angeles County allocation factors.		

ENVIRONMENTAL JUSTICE SCREENING ANALYSIS

For all siting cases, Energy Commission staff conducts the screening analysis in accordance with the "Final Guidance for Incorporating Environmental Justice Concerns in EPA's NEPA Compliance Analysis" dated April 1998.

Demographic data used in the Staff Assessment (SA) was based on population estimates provided by the marketing firm Claritas. Since the SA was released in June 2001, Census 2000 data has become available for certain demographic categories at the block level. In the Final Staff Assessment (FSA), staff has used Census 2000 data to indicate the percentage of people of color within the six-mile radius. Census 2000

poverty data at the block level is not yet available. Staff will use the data published in the SA to determine poverty levels within the six-mile radius.

Minority Population Analysis

The purpose of the screening analysis is to determine whether there exists a minority and/or low-income population within the potential affected area of the proposed project.

Minority and/or low-income populations, as defined by the U.S. Environmental Protection Agency's April 1998 Guidance for Incorporating Environmental Justice Concerns in EPA's NEPA Compliance Analyses, are identified where either:

- The minority population of the affected area is greater than fifty percent of the affected area's general population; or
- The minority population percentage of the area is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographic analysis.

Energy Commission staff has determined the potential affected area is a six-mile radius of the proposed ESPR site. The six-mile radius is consistent with the radius used for staff's cumulative air quality analysis. When a minority and/or low-income population is identified per the above, staff in the technical areas of air quality, public health, hazardous materials, noise, water, waste, traffic and transportation, visual resources, land use, socioeconomics and transmission line safety and nuisance consider possible impacts on the minority/low-income population as part of their analysis. This "environmental justice" (EJ) analysis consists of identification of significant impacts (if any), identification of mitigation, and determination of whether there is a disproportionate impact if an unmitigated significant impact has been identified.

Staff's environmental justice approach includes providing notice (in appropriate languages) of the proposed project and opportunities for participation in public workshops to minority and/or low-income communities, and providing information on staff's EJ approach to minority and/or low-income persons who attend staff's public workshops.

SOCIOECONOMICS FIGURE I shows the people of color populations based on 2000 census block data within a six-mile radius of the proposed ESPR site. According to the 2000 census block data, the people of color population in the affected area comprises 60.6 percent of the total population. This is slightly higher than the 53.3 percent people of color populations in the State of California, and less than 69.0 percent people of color populations in Los Angeles County. For comparison purposes, demographic data previously published in the SA showed a minority population of 57.6 percent.

Low-Income Population Analysis

SOCIOECONOMICS TABLE 5 contains data for low-income populations within a 6-mile radius of the project.

Socioeconomics Table 5: Low-Income Populations

	Population Below Poverty Level¹	Percent Below Poverty Level
6-Mile Radius	50,680	10.11%
Source: 1990 US Census		

The poverty threshold for a family of four persons was \$12,674 per year (1990 US Census Data). To determine the number of persons below the poverty level, Energy Commission staff reviewed data from the 1990 US Census: Poverty Status By Age; Universe: Persons for whom poverty status is determined. Because the guidelines do not give a threshold to determine the existence of a low-income population, Energy Commission staff uses the fifty-percent threshold used for minority populations. The data in **Socioeconomics Table 5** indicates that there is not a greater than 50 percent population of low-income people within the project area.

Socioeconomics Figure 1

Staff Findings

As stated above, the demographic data show that the population consisting of people of color within the six-mile radius is 60.6 percent. This population is predominantly located about three miles east and inland in the cities of Inglewood, Gardena, Hawthorne, Culver City, and Torrance.

The guidelines also state that a minority population may be identified when the minority population percentage of the area is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographic analysis. Therefore, a demographic comparison to the next larger geographic area or political jurisdiction should also be presented when determining whether impacts fall disproportionately on minority and low-income populations. For this comparison, staff looked at the 2000 data on minority populations for Los Angeles County. Comparing the six-mile radius which has a total people of color population of 60.6 percent to Los Angeles County which has a total people of color population of 69.0 percent indicates that the minority population in the six-mile radius is roughly similar to that of the county as a whole.

Property Values

Neighbors of projects similar to the proposed project have expressed property value concerns. To address such concerns on previous projects, staff has reviewed the literature on the potential property value impacts associated with linear facilities, toxic sites, and other locally unwanted land uses. In general, staff has determined that there is no information or study that demonstrates an adverse or negative impact on surrounding property values directly attributable to a natural gas-fired power plant. In this particular case, the neighboring homes in the El Porto neighborhood of Manhattan Beach have both the advantages of proximity to the adjacent beach (and views in some cases), and the disadvantage of proximity to the power plants (El Segundo and Scattergood), the Chevron refinery, and a transmission corridor. These uses have been neighbors for many years, and housing values in the area, although presumably lower than would be the case if none of the less desirable land uses were present, are primarily reflective of proximity to the beach, coastal influenced air quality, and relatively good access to employment opportunities.

Negative impacts, however, can be generated if there are significant adverse impacts such as visual, noise, traffic, or air quality. Based upon this finding and the fact that the proposed project is a replacement of an existing power plant and not a change in land use, staff has concluded that the proposed project is unlikely to adversely impact property values in the vicinity.

In this case, neighbors have voiced specific concern that the demolition of the oil storage tanks that visually buffer the neighborhood from the power plant could result in a "more industrial view" and/or exposure to temporary construction noise. Appropriate visual screening will be provided during the construction period as well as permanently. Therefore, the view will be enhanced compared to the present and there should not be an adverse impact on property values. Likewise, mitigation measures to reduce construction noise impacts should reduce temporary impacts of that activity. Please

refer to the **Noise** and **Visual** sections for a complete analysis of potential impacts and associated mitigation.

CUMULATIVE IMPACT

Los Angeles County is an area that has a relatively high level of development of public and private projects, including highway projects, new commercial development, and new residential development. There are on-going projects that would occur concurrently with the El Segundo Power Redevelopment Project should it be approved. The only potential impact from a cumulative socioeconomic point of view could be a possible shortage of workers in some trades, creating an influx of new population, having impacts on housing and schools. However, because of the size of the County and the construction labor force, no cumulative impacts are anticipated.

FACILITY CLOSURE

UNEXPECTED PERMANENT CLOSURE

Should the plant be permanently closed, the beneficial socioeconomic impacts such as worker payroll, project expenditures, local economic stimulus, and property tax revenues would no longer occur. The planned lifetime of the proposed power plant is 25 to 40 years; however, given unforeseen circumstances the plant may be retired prematurely for a variety of reasons.

UNEXPECTED TEMPORARY CLOSURE

Should the plant be temporarily shutdown or closed, there would not be any significant socioeconomic impacts. The applicant would conduct a review to determine if there had been any environmental damage or release of hazardous materials. If not, the plant could be mothballed. Before the plant begins commercial operation, the applicant will develop a contingency plan to deal with premature or unexpected closures. This would include communication with the Energy Commission, the City of El Segundo, and local agencies regarding schedule of facility closure and compliance with LORS.

PLANNED CLOSURE

In the event that the decision is made to permanently close the facility, the applicant will develop a plan for decommissioning that will be submitted to the Energy Commission and other appropriate agencies. The plan will include compliance with all applicable LORS. Should the plant be permanently closed, the beneficial socioeconomic impacts such as worker payroll, project expenditures, and property and other tax revenues would no longer occur. This would have a small adverse impact on the tax revenues of the City of El Segundo.

MITIGATION

Energy Commission staff has identified economic and fiscal benefits to the project area such as employment, project expenditures, sales, and property tax revenues.

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

Staff believes that the El Segundo Power Redevelopment Project would not cause a significant adverse direct or cumulative impact on housing, employment, schools, public services or utilities. The project would have a temporary benefit to the City of El Segundo and adjacent areas in terms of an increase in local jobs and commercial activity during the construction of the facility. The construction payroll and project expenditures would also have a positive effect on the local and county economies. The estimated benefits from the project include increases in the affected area's property and sales taxes, employment, and sales of services, manufactured goods, and equipment. Overall, staff believes that the project will have a positive socioeconomic impact on the El Segundo area. The project, as proposed, would be consistent with all applicable socioeconomic LORS.

RECOMMENDATIONS

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

PROPOSED CONDITIONS OF CERTIFICATION

The following Conditions are based on stipulated agreements between staff, the City of El Segundo, and the applicant, and are supported by the analysis outlined in the text above.

SOCIO-1 Prior to any ground disturbance activities, the project owner shall prepare a fiscal impact analysis for the project that includes analysis of the actual revenues and costs associated with the project. The revenue analysis shall include an analysis of the total property tax, franchise tax, utility user tax, sales and use tax, business license fees, building permit fees, and other revenues generated by the facility as identified in the City of El Segundo's Fiscal Impact Model. The cost analysis shall include a discussion of the cost to City services (i.e., police, fire, public works) for ongoing service to the project. The fiscal impact analysis shall compare the revenue and costs over a minimum period of five years following the start of commercial operations.

Verification: At least 30 days prior to any ground disturbance activities, the project owner shall transmit the analysis to the City of El Segundo for review and comment and to the Energy Commission Compliance Project Manager (CPM) for review and approval.

SOCIO-2 Prior to the start of commercial operations, the project owner shall pay the City of El Segundo a one-time police service mitigation fee of \$0.11 per gross square foot of building area. The gross square foot of building area and the amount of the one-time fee shall be determined by the City of El Segundo at the time the project owner submits the site plans.

Verification: Prior to the start of commercial operations, the project owner shall submit verification to the CPM that the required police service mitigation fees has been submitted to the City of El Segundo.

SOCIO-3 Prior to the start of commercial operations, the project owner shall pay the City of El Segundo a one-time fire service mitigation fee of \$0.14 per gross square foot of building area. The gross square foot of building area and the amount of the one-time fee shall be determined by the City of El Segundo at the time the project owner submits the site plans.

Verification: Prior to the start of commercial operations, the project owner shall submit verification to the CPM that the required fire service mitigation fees has been submitted to the City of El Segundo.

SOCIO-4 Prior to the start of commercial operations, the project owner shall pay the City of El Segundo a one-time library service mitigation fee of \$0.03 per gross square foot of building area. The gross square foot of building area and the amount of the one-time fee shall be determined by the City of El Segundo at the time the project owner submits the site plans.

Verification: Prior to the start of commercial operations, the project owner shall submit verification to the CPM that the required library service mitigation fees has been submitted to the City of El Segundo.

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TRAFFIC AND TRANSPORTATION

Testimony of Steven J. Brown

INTRODUCTION

The Traffic and Transportation Section of the Staff Assessment addresses the extent to which the project may affect the transportation system within the vicinity of the proposed El Segundo Power Redevelopment (ESPR) project location. The influx of large numbers of construction workers can, over the course of the construction phase, increase roadway congestion and also affect traffic flow. In addition, the transportation of large pieces of equipment can affect roadway congestion and safety. The construction of linear facilities (such as pipelines for water service) can temporarily disrupt traffic flows when trenching is required in or across roadways.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS

FEDERAL

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

- Title 49, Code of Federal Regulations, sections 171-177, governs the transportation of hazardous materials, the types of materials defined as hazardous, and the marking of the transportation vehicles.
- Title 49, Code of Federal Regulations, sections 350-399, and Appendices A-G, Federal Motor Carrier Safety Regulations, addresses safety considerations for the transport of goods, materials, and substances over public highways.

Federal Aviation Administration (FAA) regulation Title 14, Code of Federal Regulations, Part 77 requires a Notice of Construction to be filed with the FAA if the project includes a structure that is equal to or greater than 200 feet (500 feet in an uncongested area) above the average ground level for the site. A notice would also be required if the structure protrudes above an imaginary surface extending from the end of any runway, at a slope of 50:1 for 10,000 feet if the runway length is 3,200 feet or less. If the runway is 3,200 feet or longer the structure would have to penetrate an imaginary surface extending from the end of the runway at a slope of 100:1 for a distance of 20,000 feet, approximately 3.8 miles.

STATE

The California Vehicle Code and the Streets and Highways Code contain requirements applicable to the licensing of drivers and vehicles, the transportation of hazardous materials and rights-of-way. The California Health and Safety Code addresses the transportation of hazardous materials. Specific provisions include:

- California Vehicle Code, section 353 defines hazardous materials. California Vehicle Code, sections 31303-31309, regulates the highway transportation of hazardous materials, the routes used, and restrictions thereon;

- California Vehicle Code, sections 31600-31620, regulates the transportation of explosive materials;
- California Vehicle Code, sections 32000-32053, regulates the licensing of carriers of hazardous materials and includes noticing requirements;
- California Vehicle Code, sections 32100-32109, establishes special requirements for the transportation of inhalation hazards and poisonous gases;
- California Vehicle Code, sections 34000-34121, establishes special requirements for the transportation of flammable and combustible liquids over public roads and highways;
- California Vehicle Code, sections 34500, 34501, 34501.2, 34501.3, 34501.4, 34501.10, 34505.5-.7, 34506, 34507.5, 34510, and 34511, regulates the safe operation of vehicles, including those which are used for the transportation of hazardous materials;
- California Health and Safety Code, sections 25160 et seq., addresses the safe transport of hazardous materials;
- California Vehicle Code, sections 2500 to 2505, authorizes the issuance of licenses by the Commissioner of the California Highway Patrol for the transportation of hazardous materials including explosives;
- California Vehicle Code, sections 13369, 15275, and 15278, address the licensing of drivers and the classifications of licenses required for the operation of particular types of vehicles. In addition, it requires the possession of certificates permitting the operation of vehicles transporting hazardous materials;
- California Streets and Highways Code, sections 117 and 660 to 672, and California Vehicle Code sections 35780 et seq., require permits for the transportation of oversized loads on county roads;
- California Street and Highways Code, sections 660, 670, 1450, 1460 et seq., 1470, and 1480, regulates right-of-way encroachment and the granting of permits for encroachments on state and county roads.

LOCAL

City of El Segundo Municipal Code (Including Zoning)

Heavy Vehicles and Equipment

Section 10.20.010 addresses requirements for the movement of heavy vehicles on local roadways including necessary permits and maximum truck load weights.

Truck Routes

Section 10.40.010 establishes a method of designating a truck route and the requirements imposed upon such routes.

Obstructions

Sections 12.04.050 ,12.04.060, and 12.04.070 establish requirements for construction activity within the public street right-of-way including necessary permits, approval, and notification.

City of El Segundo General Plan Circulation Element (1992)

Level of Service (LOS) Standards

Policies C1-1.5 and C1-1.9 establish a LOS standard of “D” or better for the traffic circulation system in El Segundo. These policies require that existing roadways be upgraded to full Circulation Element standards if warranted by roadway operating conditions of Level of Service "E" or "F."

Project Mitigation

Policy C3-1.1 requires all new development to mitigate project-related impacts on the existing and future circulation system and further states that the mitigation measures shall be provided for and funded by the project developer.

City of Manhattan Beach Municipal Code

Construction Activity Within Public Right-of-Way

Chapters 7.08.010, 7.16.030, 7.36.010, and 7.40.020 identify requirements pertinent to construction activity within the public right-of-way including necessary permits and processes.

Heavy Vehicle Transport/Truck Routes

Chapters 14.48.010 and 14.64.010 address requirements for the movement of heavy vehicles on designated local truck routes including necessary permits and maximum truck load weights.

City of Los Angeles (Community of Playa Del Rey) General Plan Circulation Element

Provision of Adequate Accessibility - Chapter IV, Goal A

Chapter IV Goal A requires provision of adequate accessibility to work opportunities and essential services, and acceptable levels of mobility for all those who live, work, travel, or move goods in Los Angeles. Objective 5 of this goal provides for efficient movement of goods and for adequate access to intermodal facilities partly through Policy 5.8, which encourages the development, and siting of pipelines only within suitable utility corridors or public rights-of-way. This policy further states that such siting will be carried out in such a manner sensitive environments are disrupted as little as possible, to protect public health, ground water quality, and to improve the safety and reliability of the system.

Los Angeles County Regional Transportation Plan and Congestion Management Plan

The project is located in Los Angeles County. Los Angeles County is part of the Southern California Association of Governments (SCAG). SCAG is required by federal and state mandates and requirements to develop the Regional Transportation Plan (RTP), which outlines transportation goals, objectives, and policies for the SCAG region. Los Angeles County also has the Congestion Management Plan (CMP), which provides goals and policies in regards to traffic operation on the transportation system in Los Angeles County. The SCAG RTP (SCAG, 1998) and Los Angeles County CMP (amended 1990) contain the guiding policies used in the operational analysis for this project.

SETTING

REGIONAL DESCRIPTION

The El Segundo Generating Station (ESGS) site is located within the City of El Segundo in Los Angeles County, California along the shore of the Pacific Ocean. The Manhattan Beach City limits form the southern boundary of the ESPR site. Vista Del Mar is the roadway adjacent to the project site on the east and serves as the primary project access.

The critical roads and highways in the project area are described below, and shown in **TRAFFIC AND TRANSPORTATION Figure 1, Project Study Area**.

Freeways and Local Roadways

U.S Interstate 405 (San Diego Freeway), located about 4 miles east of the project site, is a north-south freeway providing regional access to the coastal communities on the west side of Los Angeles. I-405 has four lanes in each direction and auxiliary lanes. A High Occupancy Vehicle (HOV) lane is currently provided between Century Boulevard and Vermont Avenue.

U.S Interstate 105 (Glenn M. Anderson Freeway), located about 2 miles north of the project site, is an east-west freeway extending from Sepulveda Boulevard on the west to the San Gabriel Freeway (I-605) on the east. I-105 consists of three mixed-flow lanes (can be used by any vehicle) and one HOV lane in each direction.

Aviation Boulevard is a major arterial, four-lane divided roadway, providing north-south access through the cities of El Segundo and Manhattan Beach.

El Segundo Boulevard is an east-west secondary arterial from Vista Del Mar on the west to Sepulveda Boulevard on the east. It is considered a major arterial east of Sepulveda Boulevard. El Segundo Boulevard is approximately 1 mile from the

TRAFFIC AND TRANSPORTATION Figure 1
Project Study Area

Source: Adapted from Fehr and Peers Associates, Inc. ESPR Traffic and Transportation Site Assessment project site, and connects traffic from collector streets on the west side of El Segundo to I-405 and the regional freeway system.

Grand Avenue is a four-lane undivided east-west, secondary arterial roadway from Vista Del Mar on the west to Center Street.

Imperial Highway is a four-lane divided, east-west secondary arterial from Main Street on the west to Sepulveda Boulevard. East of Sepulveda Boulevard, Imperial Highway is a six-lane divided roadway.

Imperial Avenue is a two-lane undivided, east-west collector street, from Main Street on the west to California Street on the east.

Rosecrans Avenue is a five-lane divided, east-west major arterial roadway from the westerly boundary of Manhattan Beach to Sepulveda Boulevard. East of Sepulveda Boulevard, Rosecrans Avenue is a six-lane divided roadway.

Sepulveda Boulevard is an eight-lane divided, north-south major arterial roadway providing connections to I-405 north of LAX and to I-105 south of LAX. Sepulveda Boulevard provides access to northern and southern areas within the Los Angeles region. Sepulveda Boulevard is designated State Route 1 (SR-1) from Lincoln Boulevard on the north to Pacific Coast Highway on the south.

Vista Del Mar is a four-lane undivided, north-south secondary arterial roadway that bounds the easterly perimeter of the project site.

Airports

The Los Angeles International Airport (LAX) is located 2.5 miles northeast of the project. The Hawthorne Municipal Airport is located approximately seven miles east of the project and the Torrance Municipal Airport is located approximately eight miles to the south.

Railroads

Burlington Northern-Santa Fe (BNSF) and Union Pacific Railroads operate active freight spur tracks in the vicinity of the ESPR site. Union Pacific has the closest terminal approximately one-half mile northeast of the project site. This terminal is within the Chevron Refinery facilities.

The BNSF line joins the Union Pacific line approximately 1.5 miles from the project site. Either of these railroads may be used for transporting construction materials and/or equipment during the construction phase.

Port Facilities

The Los Angeles area has two major seaports. The Port of Los Angeles and the Port of Long Beach are located approximately 15 miles southeast of the site. There are also several private terminals that could be used to receive and offload equipment transported by ship.

Public Transportation

Public transportation via bus, rail, or airline is available within or near the project study area. Bus routes, bicycle facilities, and pedestrian facilities provide access directly to the project site.

Bicycle Facilities

There is a Class I bicycle facility paralleling the western boundary of the project site. This bicycle path extends along the beach adjacent to Vista Del Mar. On-street bicycle facilities (a street identified as a bicycle facility by Bike Route signing only) are provided to the southern project boundary via the streets of Manhattan Beach.

PLANNED ROADWAY AND TRANSIT IMPROVEMENTS

No planned roadway improvements are expected to affect project development. Roadway extensions are proposed on Grand Avenue and Mariposa Avenue on the eastern side of El Segundo. This roadwork is scheduled to begin in November, 2002 and be completed in October, 2003. Traffic flow for the ESPR would not have a significant impact on these roadways. No relevant transit improvement projects are proposed for the project area.

CURRENT INTERSECTION AND ROADWAY OPERATING CONDITONS

Intersections are usually the critical elements of the roadway system in assuring adequate travel capacity, maximizing safety, and minimizing environmental impacts. The operating conditions of a roadway system, including intersections, are described using the term "level of service". Level of service (LOS) is a description of a driver's experience at an intersection or roadway based on the level of congestion (delay). However, it is not a measure of safety or accident potential. LOS can range from "A", representing free-flow conditions with little or no delay, to "F", representing saturated conditions with substantial delay.

LOS standards and thresholds differ for each jurisdiction. Any study roadway or intersection operating below these thresholds is considered unacceptable for purposes of this report. The ten study intersections, the cities in which they are located and their corresponding standards, and the current service levels (AM/PM) are listed below in **TRAFFIC AND TRANSPORTATION Table 1, Intersection Level of Service – Existing Conditions**. Those listed in bold currently do not meet the service level standards.

Table 1 shows that five of the intersections are operating below acceptable standards for LOS. The unacceptable LOS occurs at one or both of the peak hours. The intersection at Vista Del Mar and Rosecrans in Manhattan Beach does not have an established LOS standard but the LOS is F in the AM Peak Hour and E in the PM Peak Hour, which is normally unacceptable in most communities.

**TRAFFIC AND TRANSPORTATION Table 1
Intersection Level of Service - Existing Conditions**

NORTH/SOUTH STREET	EAST/WEST STREET	JURISDICTION	LOS STANDARD ¹	AM PEAK HOUR (7:00-8:00)	PM PEAK HOUR (4:00-5:00)
				LOS	LOS
Vista Del Mar	Grand Ave.	Los Angeles	LOS E or better	C	B
Sepulveda Blvd.	El Segundo Blvd.	El Segundo	LOS D or better	E	F
Vista Del Mar	Imperial Hwy.	Los Angeles	LOS E or better	A	B
Pershing Dr.	Imperial Hwy.	Los Angeles	LOS E or better	B	B
Vista Del Mar	45 th St.	El Segundo / Manhattan Bch.	LOS D or better	C	B
Vista Del Mar	Rosecrans Ave.	Manhattan Bch.	No Standard	F	E
Sepulveda Blvd.	Rosecrans Ave.	El Segundo / Manhattan Bch.	LOS D or better	F	F
Aviation Blvd.	El Segundo Blvd.	El Segundo	LOS D or better	D	C
Aviation Blvd.	Rosecrans Ave.	El Segundo / Manhattan Bch. /Hawthorne ²	LOS D or better	F	F
Sepulveda Blvd.	Imperial Hwy.	El Segundo	LOS D or better	D	F

Notes:

¹ – Most restrictive standard used when multiple jurisdictions are involved.

² – Information from the City of Hawthorne is yet to be received. The City of El Segundo LOS standard is used.

Bold – denotes unacceptable conditions

LOS was measured on eight study roadway segments using methodologies contained in the *Highway Capacity Manual*, Transportation Research Board, National Research Council U.S., 1997. The roadway segments analyzed are identified in the Regional Setting section of this report under the Freeway and Local Roadways subsection.

TRAFFIC AND TRANSPORTATION Table 2, Roadway Level of Service – Existing Conditions summarizes operations on the study area roadway segments. Those listed in bold do not meet the current service level standards.

Similar to the LOS associated with the intersections in the project area, sections of Imperial Avenue, Rosecrans Avenue, and Sepulveda Boulevard are currently operating below the acceptable LOS.

TRUCK TRAFFIC

Traffic volumes on roadways adjacent to the site consist of approximately 5% heavy vehicles (i.e. trucks). Many of these trucks are serving existing industrial land uses adjacent to the site. The designated truck routes within the City of El Segundo primarily follow the arterial street system. The City of El Segundo does not have truck load limits for local roadways. Therefore, California Vehicle Code limits apply to all study

roadways (including state routes). These limits are 20,000 pounds per axle and 10,500 per wheel or wheels on one end of the axle. The front steering axle load is limited to 12,500 pounds.

**TRAFFIC AND TRANSPORTATION Table 2
Roadway Level of Service - Existing Conditions**

ROADWAY	FROM	To	JURISDICTION	LOS STANDARD ¹	LOS
Vista Del Mar	Hawaii	Rosecrans	El Segundo	LOS D or better	B
El Segundo Blvd.	Nash	Douglas	El Segundo	LOS D or better	C
Grand Ave.	Vista Del Mar	Main	El Segundo / Los Angeles	LOS D or better	A
Imperial Hwy.	Center	Sepulveda	El Segundo / Los Angeles	LOS D or better	F
Imperial Ave.	Main	Center	El Segundo / Los Angeles	LOS D or better	A
Rosecrans Ave.	Douglas	Aviation	El Segundo / Manhattan Bch.	LOS D or better	F
Sepulveda Blvd.	El Segundo	Rosecrans	El Segundo	LOS D or better	F
Vista Del Mar	Grand	City Limit	El Segundo / Los Angeles	LOS D or better	A

Notes:

¹ - Most restrictive standard used when multiple jurisdictions are involved.

Bold – denotes unacceptable conditions

ANALYSIS AND IMPACTS

THRESHOLDS OF SIGNIFICANCE

In order to determine whether there is a potentially significant impact staff reviews the project in light of the following criteria found in Appendix G of the California Environmental Quality Act (CEQA) Guidelines (title 14, California Code of Regulations, §15000 et seq.):

- traffic levels, particularly any increases that are substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections);
- level of service standards established for roads and highways;
- hazards due to a design feature (e.g., sharp curves or dangerous intersections);
- emergency access; and
- parking capacity.

In the Construction Impacts section of this analysis, staff discusses the above items found in the traffic section of Appendix G. Although not an Appendix G item, staff also discusses the potential traffic and transportation impacts of oversize and overweight loads in the Construction Impacts section. Emergency access and parking capacity are discussed primarily in the Construction Impacts section, since potential impacts in those areas are most applicable to the construction phases. Hazards to the public or the

environment through the routine transportation of hazardous material, and changes to air traffic patterns are discussed in the Operational Impacts section since potential impacts in those areas more commonly occur when the generating facility is operating.

PROJECT SPECIFIC IMPACTS

CONSTRUCTION IMPACTS

Construction Workforce and Truck Traffic

This section discusses the potential for increased traffic associated with construction of each feature of the ESPR project.

Plant site

Construction Workforce

The construction phase of the project will require a peak workforce of approximately 422 workers per day. An estimate of the number of daily trips by construction workers is based upon a worst-case assumption that all workers will drive alone (i.e., no carpooling assumed, no public transit use) to/from the site during peak hours, which would result in 844 employee commute trips.

The preferred commuting route will depend on the residence location of construction workers. Based upon the overall population distribution in the greater Los Angeles area, the applicant assumed that 50% of the project construction workforce will be commuting from the east, 20% from north of LAX airport, 25% from areas to the south, and 5% from local areas (i.e., El Segundo). Staff concurs with this assumption, given experience with other projects in the Los Angeles region.

Level of Service

To determine the potential for impact, staff assessed whether levels of congestion could increase as a result of construction employee commute trips being added to existing traffic volumes on study area roadways and intersections. This assessment included scenarios for use of each potential parking site. **TRAFFIC AND TRANSPORTATION Table 3, Intersection Level of Service – Existing Plus Project Conditions** summarizes intersection operations without and with the project assuming employee parking at the locations identified by the applicant, which are the Fed Ex site, the Los Angeles International Airport Pershing site, and County/State Beaches located north of the project.

According to the analysis, LOS at the intersection of El Segundo Boulevard at Sepulveda Boulevard located in El Segundo is expected to deteriorate from LOS E to F with the addition of project-related trips during the AM peak hour in the peak month of construction activity. The intersection of Rosecrans Boulevard and Vista Del Mar located in Manhattan Beach is expected to deteriorate from LOS E to F under both the LAX/Pershing and County/State Beach parking location scenarios with the addition of project-related trips during the PM peak hour. LOS at all other study intersections

would insignificantly change (i.e., LOS D or better to LOS D or better) with the addition of project-related traffic.

The City of Manhattan Beach does not have an adopted LOS standard for intersections. However, we have assumed that the project-related deterioration from LOS E to F at the intersection of Rosecrans Boulevard and Vista Del Mar is a significant impact. The City of El Segundo ordinances include a service level standard of LOS D or better and that project mitigation is required when a project causes deterioration of operations to an unacceptable level. The intersection of El Segundo Boulevard at Sepulveda Boulevard currently operates unacceptably at LOS E without the project and falls to LOS F with the project. Therefore, the project-related deterioration of LOS to unacceptable levels (i.e., LOS F) at this location is a significant impact. No other study intersections or roadway segments are significantly impacted (i.e. cause a location to be worse than relevant standard) by the project under existing plus project conditions with each parking site scenario. To minimize the effect of traffic on the local roadways staff has proposed that the applicant develop a traffic control plan (TCP), see proposed condition of certification **TRANS-5**. Other measures and Conditions of Certification that ensure mitigation of traffic impacts are discussed later in this analysis.

Truck Traffic

Truck deliveries of heavy equipment, construction materials (such as concrete, wire, pipe, cable, fuels), consumables and miscellaneous items are expected to occur between 6:00 AM and 6:00 PM. At the peak month of construction (month 6), 29 delivery trucks per day are expected to access the project site. This averages approximately 3 trips per hour. The addition of 3 trucks will represent a negligible increase in traffic volumes along proposed routes of travel. The proposed designated truck routes for the project include Interstates 405 (I-405) for trucks traveling north or south and 105 (I-105) for those truck trips originating east of the project. Trucks using I-405 would exit on to I-105 traveling west. From I-105 all truck traffic would follow the same route. Truck traffic would exit I-105 on to Imperial Highway. The trucks would then proceed west on Imperial Highway and south via Vista Del Mar to the project entrance. Truck traffic resulting from routine delivery of hazardous materials will occur primarily in the ESPR operation phase. Therefore, hazardous material transport is discussed under Truck Traffic in the Operation Impact Section.

Port/Rail/Truck Activity

The applicant has indicated that heavy equipment would be transported to the area by rail or ship. Both rail service and port facilities are available in the area for the applicant to use. However, neither of these facilities would allow for shipment directly to the plant site. Therefore, this equipment will still need to be offloaded at either the rail terminal or port facility and be placed on trucks for final delivery to the plant site. These trucks will be required to obtain the necessary oversize and heavy haul trip permits from the California Department of Transportation (Caltrans) and other relevant jurisdictions (as required by proposed condition of certification **TRANS-1**).

TRAFFIC AND TRANSPORTATION Table 3
Intersection Level of Service - Existing Plus Project Conditions

N/S STREET	E/W STREET	JURISDICTION	LOS STANDARD ¹	AM PEAK HOUR (7:00-8:00)				PM PEAK HOUR (4:00-5:00)			
				Exist.	Plus Project			Exist.	Plus Project		
					Fed Ex	LAX	Beach		Fed Ex	LAX	Beach
Vista Del Mar	Grand Ave.	Los Angeles	LOS E or better	C	C	C	C	B	B	B	B
Sepulveda Blvd.	El Segundo Blvd.	El Segundo	LOS D or better	E	F	F	F	F	F	F	F
Vista Del Mar	Imperial Hwy.	Los Angeles	LOS E or better	A	A	B	B	B	B	B	B
Pershing Dr.	Imperial Hwy.	Los Angeles	LOS E or better	B	C	B	B	B	B	B	B
Vista Del Mar	45 th St.	El Segundo/ Manhattan Beach	LOS D or better	C	C	C	C	B	B	B	B
Vista Del Mar	Rosecrans Ave.	Manhattan Beach	No Standard	F	F	F	F	E	E	F	F
Sepulveda Blvd.	Rosecrans Ave.	El Segundo/ Manhattan Beach	LOS D or better	F	F	F	F	F	F	F	F
Aviation Blvd.	El Segundo Blvd.	El Segundo	LOS D or better	D	D	D	D	C	C	C	C
Aviation Blvd.	Rosecrans Ave.	El Segundo/ Manhattan Beach/ Hawthorne ²	LOS D or better	F	F	F	F	F	F	F	F
Sepulveda Blvd.	Imperial Hwy.	El Segundo	LOS D or better	D	D	D	D	F	F	F	F

Notes:

¹ – Most restrictive standard used when multiple jurisdictions are involved.

² – Information from the City of Hawthorne is yet to be received. The City of El Segundo LOS standard is used.

Bold – denotes significant impact due to change in LOS with the project.

Parking Areas

The size of the construction workforce will require the workers to park in designated areas. The majority of construction employee parking will be provided at remote locations with shuttle service provided to and from the site. The applicant has not made a final decision on which parking areas to use.

The traffic impact evaluation assumes that construction employee parking will be at one or more of the following locations:

- Fed Ex site (northeast El Segundo);
- LAX Pershing site (west portion of the LAX property); and
- County/State Beach area (Hyperion, Grand Avenue, Dockweiler, and /or Marina del Rey located along the coast north of the project).

The applicant is working with the County of Los Angeles to determine if some of the beach parking lots located north of the project site can be used to accommodate

construction parking. The County has an obligation to give priority for public beach access, but does have a procedure for processing parking requests. The county will review the ESPR request for use of the beach parking lots and may grant access to one or more lots if the project parking does not compromise access to the beach. The applicant is also pursuing other off-site parking options in addition to the beach parking lots. No matter which parking lots are selected the applicant will ensure that the workforce uses these lots, and it will provide shuttle service for the workers between the remote parking lots and the project site (see proposed condition of certification **TRANS-4**).

Hazards Due To A Design Feature

The ESPR vicinity does not have any traffic/transportation design hazards or features that would adversely affect the ESPR's construction or operation phases.

linear facilities

No additional transmission lines or natural gas lines will be needed as a result of the project. The existing transmission lines and adjacent switchyard will be used. Existing gas lines have sufficient capacity for total plan operation. Connections to the existing natural gas lines already exist for Units 1 and 2 and no upgrades external to the site are needed. The workforce for the project site will also be involved in linears (i.e. water, sewer and ammonia pipelines) construction, so the linears will not increase the number of workers and vehicle trips beyond the current worst case estimate.

Natural Gas Pipeline

No changes to the natural gas pipeline or onsite connection to the pipeline is being proposed for the redevelopment project.

Water Supply Pipelines

Construction of new potable and reclaimed water supply lines are proposed for the project. These supply lines will begin at the intersection of Eucalyptus Drive and El Segundo Boulevard. The pipeline will be installed in a common trench that will extend approximately 1.5 miles, routed west along El Segundo Boulevard, north on Richmond Street, west on Grand Avenue, and south on Vista Del Mar. Immediately north of the project site, the new water supply pipelines will be routed under Vista Del Mar at an overpass currently used by the adjacent Chevron Refinery for routing pipe. Construction of these water pipelines will take place within the street right-of way and therefore temporarily affect traffic flow.

To ensure that the effects of linear construction activity are not significant staff has proposed mitigation measures and conditions of certification **TRANS-2** and **TRANS-5**. **TRANS-5** requires the applicant to develop a traffic control plan to be followed prior to the start of construction. Linear construction related mitigation measures should include but not be limited to:

- Proper advanced notification should be provided to property owners likely to be affected.

- The notification should be followed by periodic updates on construction activity that would include the date when driveway obstruction would occur.
- For those business with heavy daily truck traffic the applicant should coordinate with the owners/representatives to develop temporary access schemes for various stages of the construction activity to allow the facilities to continue to operate with minimal disruption.
- For two-lane roadways at least one lane will remain open. In those roadways greater than two lanes at least two lanes will be open for traffic to travel in both direction.
- Implementing lower speed limits through the construction/work zones and utilizing the presents of law enforcement or flagman if necessary to ensure that motorists obey the reduced speed limit signs.
- Ensuring that adequate signing and appropriate traffic control devices are installed in the proper location to warn motorists of impending construction activity.
- For crossing intersections, advance notification in the form of roadside signs should be provided to the driving public that the particular intersection will be closed to traffic with information such as the anticipated time frame and duration of construction activity. Detour signs should be provided where appropriate to reroute traffic.
- Provide adequate illumination on the work zone under conditions of limited visibility such as night construction or inclement weather.
- Restricting linears construction work if necessary to off-peak or evening hours to avoid conflict with heavy traffic volume.
- Require construction personnel to wear reflectorized clothing or vests to ensure visibility by motorists.
- If a sidewalk becomes occupied by the work area, a temporary pedestrian walkway should be constructed to maintain accessibility to the area.
- For those street with parking, signs should be posted well in advance to warn motorists that the parking lane will be closed between certain dates.

Staff also wants to ensure that the local roadways are returned to as near as original conditions as possible after construction activity and has proposed condition of certification **TRANS-7**.

Effluent Water Discharge Line

A proposed sanitary waste pipeline will begin on the project property, be routed to the southern project boundary, and then extend for approximately 200 feet to an existing manhole at the intersection of The Strand and 45th Street in the City of Manhattan Beach. Construction of the pipeline will take place within the street right-of way and therefore temporarily impact traffic flow.

Aqueous Ammonia Pipeline

A proposed pipeline carrying aqueous ammonia will begin at a junction on the Chevron Refinery and be routed for approximately 0.5 miles to the north boundary under Vista Del Mar via the underpass currently used by the Chevron Refinery to route pipelines. The pipeline will be routed under Vista Del Mar just north of El Segundo Generating Station (ESGS). This pipeline will be added to others in an existing trench, which

functions somewhat like a road underpass. Traffic on Vista Del Mar will not be affected. The pipeline will then be routed south along an existing ESGS retaining wall to the aqueous ammonia storage tank.

Emergency Access

Fire protection would be provided by both of the El Segundo fire stations. Station#1 at 314 Main Street is the closest station, located approximately 1.5 miles northeast of the project, and is staffed by both firefighters and paramedics. Services from this location would take Grand Avenue to Vista Del Mar and then Vista Del Mar to the plant site. Pipeline construction could require the temporary lane closures on Grand Avenue and Vista Del Mar. It will be the responsibility of the applicant to ensure that any lane closures would not impede the efforts of the emergency vehicle in reaching the site and to maintain emergency vehicle access (see proposed Condition of Certification **TRANS-5**). It was estimated that the response time from Station #1 would be between 3 to 5 minutes.

The El Segundo Police Department would provide police protection for the site. The estimated response time to the project by the police is approximately four minutes.

The closest hospital with full emergency services is the Robert F. Kennedy Medical Center in Hawthorne, approximately four miles northeast of the site. There are industrial medical clinics in El Segundo, and several other medical centers five to 10 miles from the project site.

Oversize and Overweight Loads

Transportation of construction equipment and heavy components (e.g. the turbines) that will exceed the load size and limits of certain roadways will require special permits from the City of El Segundo, City of Los Angeles, City of Manhattan Beach, and/or Caltrans. Mitigation measures and proposed Conditions of Certification **TRANS-1** and **TRANS-7**, which would ensure this compliance, are discussed later in this analysis.

OPERATIONAL IMPACTS

Commute Traffic

The proposed project is expected to add two new full-time employees above the current operations employee levels. This increase in staff represents an insignificant increase in traffic levels as a result of the on-going operation the power plant.

Truck Traffic

Deliveries to the project site are expected for on-going maintenance of the plant. The incremental change in the number of delivery trips to the plant site is expected to be nominal and will generally occur during non-commute periods. Therefore, the resulting LOS on local roadways would remain unchanged from the existing LOS.

Hazardous Materials

The transportation and handling of hazardous substances associated with the project can increase roadway hazard potential. During operation this would be the delivery of aqueous ammonia. To minimize this risk, the ESPR Project plans to purchase the

required ammonia from the nearby Chevron Refinery. It will take delivery of the ammonia via a pipeline to be constructed between the refinery and plant site. If hazardous material is delivered to the plant the potential impacts of its transportation can be mitigated to insignificance by compliance with Federal and State standards established to regulate the transportation of Hazardous Substances (see staff proposed Condition of Certification **TRANS-3**).

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

The California Vehicle Code and the Streets and Highways Code (Sections 31600 through 34510) are equally important to ensure that the transportation and handling of hazardous materials are done in a manner that protects public safety. Enforcement of these statutes is under the jurisdiction of the California Highway Patrol.

The handling and disposal of hazardous substances are also addressed in the **Waste Management, Workers Safety and Fire Protection**, and **Hazardous Materials** sections of this report.

Change In Air Traffic Patterns

The ESGS is located approximately 2.5 miles southwest of the Los Angeles International Airport. The Federal Aviation Administration (FAA) in Title 14, Code of Federal regulations, Sections 77.21, 77.23, and 77.25 established standards for determining obstructions in navigable airspace. The ESGS stack height of approximately 215 feet requires the applicant to file Form 7460-1 "Notice of Proposed Construction or Alteration" with the FAA. The FAA has determined that the ESPR stacks will not create an airspace obstruction (see Land Use section for discussion).

TRANS-6 requires the applicant to comply with the FAA regulations for stack lighting and marking.

Vapor plumes

The modeling results indicated that the current plumes coming from the existing Units 1 and 2 stacks are significantly more frequent and larger than the predicted plumes from the new ESPR units, see the **Visual Resources Section**. Therefore, the new units would result in a reduction of any plume effects caused by the current operation of Units 1 and 2.

CUMULATIVE IMPACTS

Based on the current and future traffic characteristics of the area, congestion associated with the operation of the project is nominal. With mitigation, regional and local roadways will have adequate capacity to accommodate project construction traffic.

The **LAND USE** section of this FSA identifies several development projects that could potentially create a cumulative impact on the area if combined with project traffic. The list of projects included in Table 5.20-1 of the AFC represents transportation projects located within a five-mile radius of the project site, a one-mile radius of proposed linear facilities, and projects of potential regional significance.

Staff has concluded that the traffic volume from all cumulative projects, plus the power plant project would likely increase the congestion levels on area roadways and intersection. However, the construction schedules for these projects may not overlap with the ESPR construction schedule. The impacts associated with the construction phase of the ESPR project are short-term and the operational phase impacts will be insignificant due to the slight increase in employees (i.e., 2 new full-time employees) above current conditions, thus significant impacts are not expected under cumulative conditions.

FACILITY CLOSURE

The minimum design life of the power plant is expected to be 30 years. To ensure that the planned closure will be completed in a manner that complies with all LORS, at least twelve months prior to the proposed decommissioning, the applicant shall prepare a closure plan for submission to the Energy Commission for review and action. At the time of closure all then-applicable LORS will be identified and the closure plan will address how these LORS will be complied with. The effects of closure for the El Segundo Generation Station on traffic and transportation will be similar to those discussed for the construction of the project. Closure will create traffic levels that are similar in intensity and duration to those expected during facility construction. The removal of waste and other materials will produce impacts from truck traffic. At this time, no specific conclusions can be drawn about the effects of project closure on traffic and transportation.

MITIGATION

The applicant has indicated their intention to comply with all LORS relating to:

- the transport of hazardous materials (**TRANS-3**);
- the transport of oversized loads (TRANS-1); and
- the receipt and compliance with all necessary encroachment and transportation permits for any construction activity within the public right-of-way (**TRANS-2**).

Staff has recommended Conditions of Certification below to ensure compliance with these LORS. Staff also recommends adoption of conditions of certification to require the applicant to implement the following traffic and transportation mitigation measures:

- enforce a policy that all project-related parking occurs in designated parking areas (TRANS-4);

- repair any damage to adjacent roadway sections incurred during construction to the road's pre-project construction condition (**TRANS-7**). Any repair work needed shall occur outside of the ambient street traffic peak periods; and
- prepare a Traffic Control Plan (TRANS- 5) subject to review by the City of El Segundo, the City of Manhattan Beach, and the City of Los Angeles. The Traffic Control Plan should include measures to ensure that at least 40 percent of project-related traffic previously assumed to occur during the AM peak hour, occurs outside of the AM peak hour; and at least 80 percent of project-related traffic previously assumed to occur during the PM peak hour occurs outside of the PM peak hour. This will mitigate the project impacts at the intersection of El Segundo Boulevard and Sepulveda Boulevard during the AM peak hour and Rosecrans Boulevard at Vista Del Mar during the PM peak hour to a level of insignificance. The Traffic Control Plan should specify measures to mitigate impacts associated with construction activities occurring within any public street right-of-way in accordance with local jurisdictional requirements.
- HRSG stacks shall be marked and lighted if required by the FAA so that they do not create a hazard to air navigation (**TRANS-6**).

CONCLUSIONS

Staff has concluded that the intersections and roadways that are operating at acceptable LOS (LOS of D or better) will not see a decline in their LOS to an unacceptable LOS. Since some of the area intersections and roadways are operating at a LOS of "E" or "F" the potential exists for the project to cause an impact in the traffic and transportation area. Any identified impacts can be mitigated to a level of insignificance by implementing the mitigation measures recommended in the proposed conditions of certification.

CONDITIONS OF CERTIFICATION

Some of the Conditions of Certification in this section have been changed from the PSA based on staff's efforts to standardize Conditions of Certification to the extent feasible based on recent experience in the certification and compliance process. These changes do not affect the substance of the requirements in the Condition. Other Conditions have been changed based on stipulated agreements between staff and the applicant. All of the modified Conditions are supported by the analysis outlined in the text above.

TRANS-1 The project owner shall comply with Caltrans and other relevant jurisdictions limitations on vehicle sizes and weights. In addition, the project owner or its contractor shall obtain necessary transportation permits from Caltrans and all relevant jurisdictions for roadway use.

Verification: In the Monthly Compliance Reports, the project owner shall submit copies of any permits received during that reporting period. In addition, the project owner shall retain copies of these permits and supporting documentation in its compliance file for at least six months after the start of commercial operation.

TRANS-2 The project owner or its contractor shall comply with Caltrans and other relevant jurisdictions limitations for encroachment into public rights-of-way and shall obtain necessary encroachment permits from Caltrans and all relevant jurisdictions.

Verification: In Monthly Compliance Reports, the project owner shall submit copies permits received during the reporting period. In addition, the project owner shall retain copies of these permits and supporting documentation in its compliance file for at least six months after the start of commercial operation.

TRANS-3 The project owner shall ensure that permits and/or licenses are secured from the California Highway Patrol and Caltrans for the transport of hazardous materials.

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

TRANS-4 During construction of the power plant and all related facilities, the project shall develop a parking and staging plan for all phases of project construction to enforce a policy that all project-related parking occurs on-site or in designated off-site parking areas.

Verification: At least 60 days prior to start of site mobilization, the project owner shall submit the plan to the City of El Segundo and other jurisdiction affected by site selection, such as the City and/or County of Los Angeles for review and comment, and to the CPM for review and approval.

TRANS-5 The project owner shall consult with the Cities of El Segundo, Manhattan Beach and Los Angeles, and prepare and submit to the CPM for approval a construction traffic control plan and implementation program which addresses the following issues:

- Timing of heavy equipment and building materials deliveries;
- Redirecting construction traffic with a flagperson;
- Signing, lighting, and traffic control device placement if required;
- Need for construction work hours and arrival/departure times outside of peak traffic periods;
- Ensure access for emergency vehicles to the project site;
- Temporary travel lane closure; and
- Access to adjacent residential and commercial property during the construction of all linears.

Verification: At least 30 days prior to site mobilization, the project owner shall provide to the CPM a copy of the referenced documents.

TRANS-6 The HRSG stacks shall have all the lighting and marking required by the Federal Aviation Authority (FAA) so that the stacks do not create a hazard to air navigation.

The project owner shall submit to the FAA Form 7460-1, Notice of Proposed Construction or Alteration and supporting documents on how the project plans to comply with stack lighting and marking requirements imposed by the FAA.

Verification: At least 30 days prior to the start of construction, the project owner shall provide copies of the FAA Form 7460-1 with copies of the FAA response to Form 7460-1, to the CPM and the City of El Segundo Planning Department.

TRANS-7 Following completion of ESPR project construction, the applicant shall repair any damage to the segment of Vista Del Mar and other roadways affected by linear construction activity along with the primary roadways identified in the traffic control plan for construction traffic to the road's pre-project construction condition.

Prior to start of construction, the project owner shall photograph, videotape or digitally record images of Vista Del Mar and the roadways that will be affected by linear construction and heavy construction traffic. The project owner shall provide the Compliance Project Manager (CPM), and the Cities of El Segundo, Manhattan Beach and Los Angeles with a copy of the images for the roadway segments under their jurisdiction. Prior to start of construction, the project owner shall also notify the Cities of El Segundo, Manhattan Beach and Los Angeles about the schedule for project construction. The purpose of this notification is to postpone any planned roadway resurfacing and/or improvement projects until after the project construction has taken place and to coordinate construction related activities associated with other projects.

Verification: Within 30 days after completion of the redevelopment project, the project owner shall meet with the CPM and the Cities of El Segundo, Manhattan Beach, and Los Angeles to determine and receive approval for the actions necessary and schedule to complete the repair of identified sections of public roadways to original or as near original condition as possible. Following completion of any regional road improvements, the project owner shall provide to the CPM a letter from the Cities of El Segundo, Manhattan Beach and Los Angeles if work occurred within their jurisdictional public right of way stating their satisfaction with the road improvements.

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TRANSMISSION LINE SAFETY AND NUISANCE

Testimony of Obed Odoemelum, Ph.D.

INTRODUCTION

As presented in the **Project Description** section, the proposed El Segundo Power Redevelopment project (ESPR) is a modification of the existing El Segundo Generating Station (ESGS) owned by the applicant, El Segundo Power II LLC. This proposed modification is intended to increase the amount of electric power presently generated at the facility per unit of natural gas fuel utilized. The generated power will be transmitted off site to the Southern California Edison (SCE) power grid by way of the presently utilized SCE 230 kV El Segundo Switchyard located adjacent to ESGS. This transmission will be made using existing SCE transmission lines, meaning that no new off-site transmission lines will be built in connection with the proposed project modification. The only new lines would be the two on-site 230 kV overhead connections between the new replacement generating units 5, 6, and 7 and the SCE Switchyard. As replacement lines, these new lines will be located within the same route as the connecting lines for the existing 1950s-vintage units 1 and 2, which are the units to be replaced. Since the post-modification power will still be transmitted at the existing 230 kV, the system's electric fields will remain the same, meaning that all electric field, field-related impacts will remain the same along the line routes. The only fields that would change are the companion magnetic fields, which alone depend on the current flow and will therefore, increase with the increased power generation.

The purpose of this analysis is to (a) assess the construction and operation of the on-site replacement lines for appropriate incorporation of the design measures necessary for compliance with existing LORS, and (b) determine whether or not the magnetic field increases in the off-site lines would allow for compliance with these LORS as related to magnetic field intensity. If compliance is established for both lines, Energy Commission staff (staff) would recommend approval of the applicant's operational plans; if not, staff would recommend revisions as appropriate. Staff's analysis will focus on the issues noted below which relate primarily to the physical presence of the line or secondarily to the physical interactions of line electric and magnetic fields.

- Aviation safety;
- Interference with radio-frequency communication;
- Audible noise;
- Fire hazards;
- Hazardous shocks;
- Nuisance shocks; and
- Electric and magnetic field (EMF) exposure.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS

Discussed below by subject area are design-related laws, ordinances, regulations and standards (LORS) applicable to the physical impacts of the lines to be associated with the ESPR project. The impacts of concern are addressed through specific federal or state regulations or through established industry standards and practices. There presently are no local laws or regulations specifically focused on limiting the physical structure, dimensions, or operation of these lines.

AVIATION SAFETY

Any hazard to aircraft in the project area relates to the potential for collision with the electric power line in the navigable air space. The applicable federal LORS as discussed below are intended to ensure the distance and visibility necessary to avoid such collisions.

Federal

Title 14, Code of Federal Regulations (CFR), part 77, "Objects Affecting the Navigation Space." Provisions of these regulations specify the criteria used by the Federal Aviation Administration (FAA) for determining whether a "Notice of Proposed Construction or Alteration" is required for potential obstruction hazards. The need for such a notice depends on factors related to the height of the structure, the slope of an imaginary surface from the end of nearby runways to the top of the structure, and the length of the runway involved. Such notification allows the FAA to ensure that the structure is located to avoid any significant hazards to area aviation.

FAA Advisory Circular (AC) No. 70/460-2H, "Proposed Construction and or Alteration of Objects that may Affect the Navigation Space." This circular informs each proponent of a project that could pose an aviation hazard of the need to file the "Notice of Proposed Construction or Alteration" (Form 7640) with the FAA.

FAA AC No. 70/460-1G, "Obstruction Marking and Lighting". This circular describes the FAA standards for marking and lighting objects that may pose a navigation hazard as established using the criteria in Title 14, CFR, part 77.

INTERFERENCE WITH RADIO-FREQUENCY COMMUNICATION

Transmission line-related radio-frequency interference is one of the indirect effects of line operation produced by the physical interactions of line electric fields. The level of such interference usually depends on the magnitude of the electric fields involved. Because of this, the potential for such impacts can be assessed from field strength estimates obtained for the line. The following regulations are intended to ensure that such lines are located away from areas of potential interference and that any interference is mitigated whenever it occurs.

Federal

Federal Communications Commission (FCC) regulations in title 47 CFR, section 15.25. Provisions of these regulations prohibit operation of any devices producing force fields, which interfere with radio communications, even if (as with transmission lines) such devices are not intentionally designed to produce radio-frequency energy. Such

interference is due to the radio noise produced by the action of the electric fields on the surface of the energized conductor. The process involved is known as corona discharge but is referred to as spark gap electric discharge when it occurs within gaps between the conductor and insulators or metal fittings. When generated, such noise manifests as perceivable interference with radio or television signal reception or interference with other forms of radio communication. Since the level of interference depends on factors such as line voltage, distance from the line to the receiving device, orientation of the antenna, signal level, line configuration and weather conditions, maximum interference levels are not specified as design criteria for modern transmission lines. The FCC requires each line operator to mitigate all complaints about interference on a case-specific basis. Staff usually recommends specific conditions of certification as necessary to ensure compliance with this FCC requirement.

State

General Order 52 (GO-52), California Public Utilities Commission (CPUC). Provisions of this order govern the construction and operation of power and communications lines and specifically deal with measures to prevent or mitigate inductive interference. Such interference is produced by the electric field induced by the line in the antenna of a radio signal receiver.

Several design and maintenance options are available for minimizing these electric field-related impacts. When incorporated in the line design and operation, such measures also serve to reduce the line-related audible noise discussed below.

AUDIBLE NOISE

Industry Standards

There are no design-specific federal regulations to limit the audible noise from transmission lines. As with radio noise, such noise is limited instead through design and maintenance standards established from industry research and experience. These standards have proven effective without significant impacts on line safety, efficiency maintainability and reliability. All high-voltage lines are designed to assure compliance with these standards. Any noise will usually result from the action of the electric field at the surface of the line conductor and could be perceived as a characteristic crackling, frying, hissing sound, or hum. Since (as with communications interference), the noise level depends on the strength of the line electric field, the potential for occurrence can be assessed from estimates of the field strengths expected during operation. Such noise is usually generated during wet weather and from lines of 345 kV or higher. It is, therefore, not generally expected at significant levels from lines of less than 345 kV such as the on-site or off-site lines associated with the proposed project. Research by the Electric Power Research Institute (EPRI 1982) has validated this by showing the fair-weather audible noise from modern transmission lines to be generally indistinguishable from background noise at the edge of a 100-ft right-of-way.

NUISANCE SHOCKS

Industry Standards

There are no design-specific federal regulations to limit nuisance shocks in the transmission line environment. For modern high-voltage lines, such shocks are effectively minimized through grounding procedures specified in the National Electrical Safety Code and the joint guidelines of the American National Standards Institute (ANSI) and the Institute of Electrical and Electronics Engineers (IEEE). Nuisance shocks are caused by current flow at levels generally incapable of significant physiological harm. They result mostly from direct contact with metal objects electrically charged by fields from the energized line. Such electric charges are induced in different ways by the line electric and magnetic fields.

The applicant is usually responsible for ensuring compliance with these grounding-related practices within the right-of-way. Staff usually recommends specific conditions of certification as necessary to ensure that such grounding is made within the right-of-way by both the applicant and property owners.

FIRE HAZARDS

The following regulations address fire hazards that could be caused by sparks from conductors of overhead lines or that could result from direct contact between the line and nearby trees and other combustible objects.

State

- General Order 95 (GO-95), CPUC, “Rules for Overhead Electric Line Construction” specifies tree-trimming criteria to minimize the potential for power line-related fires.
- Title 14, California Code of Regulations (CCR), section 1250, “Fire Prevention Standards for Electric Utilities” specifies utility-related measures for fire prevention.

HAZARDOUS SHOCKS

The hazardous shocks that are addressed by the following regulations and standards are those that could result from direct or indirect contact between an individual and the energized line. Such shocks are capable of serious physiological harm or death and remain a driving force in the design and operation of transmission and other high-voltage lines.

State

- GO-95, CPUC. “Rules for Overhead Line Construction”. These rules specify uniform statewide requirements for overhead line construction regarding ground clearance, grounding, maintenance and inspection. Implementing these requirements ensures the safety of the general public and line workers.
- Title 8, CCR, section 2700 et seq., “High Voltage Electric Safety Orders.” These safety orders establish essential requirements and minimum standards for safely installing, operating, and maintaining electrical installations and equipment.

Industrial Standards

There are no design-specific federal regulations to prevent hazardous shocks from power lines. Safety is assured through compliance with the requirements in the National Electrical Safety Code, Part 2: Safety Rules for Overhead Lines. These provisions specify the minimum national safe operating clearances applicable in areas where the line might be accessible to the public. They are intended to minimize the potential for direct or indirect contact with the energized line.

ELECTRIC AND MAGNETIC FIELD (EMF) EXPOSURE

The possibility of deleterious health effects from electric and magnetic field exposure has increased public concern in recent years about living near high-voltage lines. Both fields occur together whenever electricity flows, hence the general practice of considering exposure as EMF exposure. As noted by the applicant (ESPR 2000a, pages 5.16-14 and 5.16, and 5.18-30 through 5.18-33), the available evidence as continually evaluated by CPUC and other regulatory agencies, has not established that such fields pose a significant health hazard to exposed humans. However, staff considers it important, as does the CPUC, to note that while such a hazard has not been established from the available evidence, the same evidence does not serve as proof of a definite lack of a hazard. Staff, therefore considers it appropriate, in light of the present uncertainty, to reduce such fields to the extent feasible.

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

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

State

In California, the CPUC (which regulates the installation and operation of high-voltage lines in California) has determined that only no-cost or low-cost measures are presently justified in any effort to reduce power line fields beyond levels existing before the present health concern arose. The CPUC has further determined that such reduction should be made only in connection with new or modified lines. It required each utility within its jurisdiction to establish EMF-reducing design guidelines for all new or upgraded power lines and related facilities within their respective service areas. The CPUC further established specific limits on the resources to be used in each case for field reduction. Such limitations were intended by the CPUC to apply to the cost of any redesign to reduce field strength or relocation to reduce exposure. Utilities not within the jurisdiction of the CPUC voluntarily comply with these CPUC requirements. This PUC policy resulted from assessments made to implement CPUC Decision 93-11-013 of 1989.

In keeping with this CPUC policy, staff requires evidence that each proposed line (whether new or modified) will be designed to incorporate the EMF-reducing design guidelines applicable to the utility service area involved. The service area in this case is that of SCE. These field-reducing measures can impact line operation if applied without appropriate regard for environmental and other local issues bearing on safety, reliability efficiency and maintainability. It is, therefore, up to each applicant to ensure that such measures are applied in ways that have no significant impacts on line operation. The extent of such applications will be reflected by the ground-level field strengths as measured during operation. When estimated or measured for the line, such field strengths can be used by staff and other regulatory agencies for comparison with fields of lines of similar voltage and current-carrying capacity. Because of this, staff requires their measurements for each new or modified line.

The field strengths (or intensities) of any given line can be estimated using established procedures. Estimates are specified for a height of one meter above the ground, in units of kilovolts per meter (kV/m) for the electric field, and milligauss (mG) for the companion magnetic field. Their magnitude depends on line voltage (in the case of electric fields), the geometry of the structures, degree of cancellation from nearby conductors, distance between conductors and, in the case of magnetic fields, amount of current in the line.

Since each new or modified line in California is currently required to be designed according to the safety and EMF-reducing guidelines of the utility in the service area involved, their fields are required under existing CPUC policies to be similar to fields from similar lines in that service area. A condition of certification is usually proposed by staff to verify implementation of the reduction measures necessary. The applicable condition for this project is **TLSN-1**.

Industrial Standards

No federal regulations have been established specifying environmental limits on the strengths of fields from power lines. However, the federal government continues to conduct and encourage research necessary for an appropriate policy on the EMF issue.

In the face of the present uncertainty, several states have opted for design-driven regulations ensuring that fields from new or modified lines are generally similar to those from existing lines. Some states (Florida, Minnesota, Montana, New Jersey, and New York) have set specific environmental limits on one or both fields in this regard. These limits are, however, not based on any specific health effects. Most regulatory agencies believe, as does staff, that health-based limits are inappropriate at this time. They also believe that the present knowledge of the issue does not justify any retrofit of existing lines.

Before the present health-based concern developed, measures to reduce field effects from power line operations were mostly aimed at the electric field component, whose effects can manifest as the previously noted radio noise, audible noise and nuisance shocks. The present focus is on the magnetic field because only it can penetrate building materials to potentially produce the types of health impacts at the root of the present concern. As one focuses on the strong magnetic fields from the more visible transmission and other high-voltage power lines, staff considers it important for

perspective, to note that an individual in a home could be exposed for short periods to much stronger fields while using some common household appliances (National Institute of Environmental Health Services, 1995). Scientists have not established which of these types of exposures would be more biologically meaningful in the individual. Staff notes such exposure differences only to show that high-level magnetic field exposures regularly occur in areas other than the power line environment.

SETTING

The proposed ESPR project is located on a 5.5-acre portion of the existing ESGS facility, which occupies a site of approximately 33 acres in the City of El Segundo (ESPR 2000a, pages 3.2-1, 3.4-2 and 5.18-1). Since the project-specific, on-line connection to the SCE El Segundo Switchyard will remain within the same corridor as the lines for the existing Units (1 and 2) to be replaced, this corridor will remain the only source of line-related fields between the SCE Switchyard and the replacement units. Since this on-site interconnection will lie entirely within the ESGS property boundaries, the residential exposures at the root of the present health concern would be insignificant with respect to these new lines. With no public access to the ESGS site, the only exposure of potential significance would be the relatively short-term exposure to line workers, other facility workers, or any individuals who may enter the project site. These types of exposures are well understood as not significantly responsible for the present health-based concern. The only sources of residential exposure will continue to be the existing off-site SCE grid lines that will still be used after the proposed modification. The regulatory significance of their project-related increases is one of the main points at issue in this analysis.

As discussed by the by the applicant (ESPR 2000a, pages 3.6-3 and 3.6-4), the two beginning sections of these SCE system kV lines in question presently exit the El Segundo Switchyard from where one interconnects with the El Nido Substation while the other first interconnects with the Chevmain Substation (at the Chevron El Segundo refinery) before proceeding to the same El Nido Substation. Both lines are about the same length and essentially share the same right-of-way and tower structures on their route between El Nido and El Segundo. The interactive effects of their individual fields would be reflected in the field strength values estimated for this right-of-way. Since these lines were designed and continue to be owned and operated by SCE, staff assumes that they were designed according to SCE design and operational guidelines reflecting compliance with existing LORS. Compliance with such guidelines is the main requirement of the previously noted CPUC policy on power lines and their field impacts.

PROJECT DESCRIPTION

According to information from the applicant (ESPR 2000a, pages 3.6-1 through 3.6-5), the power delivery lines to be used for the proposed will consist of the specific components listed below:

- the two overhead on-site lines connecting the new Units 5, 6, and 7 and the on-site SCE Switchyard; and

- the existing SCE transmission lines extending from the on-site SCE Switchyard to area substations.

The new on-site lines will be supported on single-shaft tubular steel poles allowing for conductor-to-ground clearance of at least 30 feet. The applicant provided the structural details of these line supports together with the points of line connection to the SCE Switchyard (ESPR 2000a, pages 3.6-2 through 3.6-8, and page 5.18-1).

IMPACTS

GENERAL IMPACTS

GO-95 and Title 8, CCR Section 2700 et seq. provide the minimum regulatory requirements necessary to avoid the direct or indirect line contact previously discussed in connection with hazardous shocks and aviation hazards. Of secondary concern are the field-related impacts considered in terms of the also noted nuisance shocks, radio noise, communications interference and field exposure. The relative magnitude of such impacts would depend on the field strengths characteristic of a given line design. Since the field-reducing measures can affect line operations, the extent of their implementation together with related field strengths, will vary according to environmental and other local conditions bearing on line safety, efficiency, reliability and maintainability. They will therefore, vary from one service area to the other according to prevailing conditions. It would be up to each project proponent to apply such measures to the extent appropriate for the geographic area involved. The potential for these impacts is assessed separately for each proposed project.

PROJECT SPECIFIC IMPACTS

Impacts from Physical Presence

The on-site lines that presently connect Units 1 and 2 to the SCE Switchyard were designed according to SCE's guidelines bearing on aviation safety, fire hazards, field strength reduction and hazardous shocks. These lines have been safely used from the start of ESGS operations in 1955 without such impacts. Since the replacement lines will be designed according to these same guidelines (as currently required by CPUC), and located within the same route within ESG's property lines, staff considers it appropriate to assume that such satisfactory use will continue in the post-modification era. Therefore, no specific conditions for certification are recommended.

Electric Field effects

The potential for electric field-related audible noise, nuisance shocks, and interference with radio-frequency communication depends on the field strength levels, which in turn, depend on line voltage. Since (a) there will be no change in the voltage in the utilized lines and (b) the proposed and existing lines reflect compliance with SCE guidelines bearing on these electric field effects, staff considers their proposed use as appropriate with respect to these electric field effects.

Electric and Magnetic Field Exposure

The applicant (ESPR 2000a, pages 5.18-4 and page 5.18-14) measured the electric field strengths at the perimeter of the existing SCE Switchyard to assess existing electric field exposures near it. Measured fields were reported to range from 0.1 kV/m to 4.4 kV/m. For the existing on-site lines, related exposures in the nearest public impact areas were measured as between 0.006 kV/m and 0.027 kV/m. Current exposures at the nearest points of public access to the existing SCE lines were measured as between 0.02 kV/m and 0.14 kV/m. The estimates for the post-modification period (of increased current flow) were reported as 1.1 kV within and at the edge of the right-of-way. These relatively low field strength values are as expected for similar SCE lines and related facilities.

Since residences are not intended to be built within transmission line rights-of-way, this edge of each right-of-way would mark the starting point of any residential exposures as well as the electric field impacts of concern in this analysis. Staff does not expect such impacts to be significant at the measured and estimated field levels as (a) borne out by the applicant's calculations (ESPR 2000a, pages 5.18-37 through 5.18-47), and (b) typical of SCE lines of the same voltage.

According to the applicant (ESPR 2000a, pages 5.18-19 through 5.18-27), existing magnetic field exposures at the nearest point of public access to the existing SCE Switchyard were measured to range from 10 mG to 37 mG. The nearest public access point in this regard is a spot 50 feet away. Exposures at these access points were measured to vary from 6.2 mG to 3.9 mG with respect to the on-site connecting lines. For the off-site SCE lines, maximum magnetic field exposures at these public access points (beginning about 25 feet away) were measured to range from about 4.8 mG to 11 mG. Existing field strengths were calculated to vary between from 10.3 mG to 32.8 mG at the edge of the right-of-way and between 18.9 mG to 60.0 within the right of way.

A maximum post-modification field strength of 41.5 mG was calculated for the edge of the right-of-way while a maximum value of 76.0 mG was calculated for the area within it. Since the right-of-way is intended as the beginning of the areas of human habitation around transmission line, measurements at this point would reflect the maximum residential exposures possible in the post-modification period at issue.

As with their companion electric fields, these magnetic fields values are as expected for SCE lines of similar voltage and current carrying capacity and significantly lower than 150 mG to 250 mG established for transmission lines and related facilities by states with specific regulatory limits. The applicant has pointed to this fact (ESPR 2000a, page 5.18-34). Maintaining these project-related fields within existing limits would reflect compliance with the noted CPUC policy on EMF and health.

Staff has recommended condition of certification **TLSN-2** to (a) verify the field strength reduction assumed by the applicant for the on-site replacement lines and (b) ensure compliance with the field strength limitations assumed for the existing SCE lines in the post-modification era of current flow increases.

CUMULATIVE IMPACTS

The strengths of electric and magnetic fields from the proposed and similar lines are usually calculated to factor the interactive effects of fields from nearby lines. Therefore, the values calculated or measured for the proposed on-site replacement lines reflect the levels of any cumulative exposures that could occur at any point along its route entirely within the ESGS property. For the off-site SCE lines to be used, the calculated values reflect the interactive effects of fields in their impact areas. As reflected in these values, any exposure of a cumulative nature would be at levels associated with similar 230 kV lines within the SCE transmission system.

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

Since the proposed replacement lines would (a) be designed according to SCE's health and safety guidelines and (b) be located entirely within the fenced off ESGS site, staff does not expect their operation to pose a significant risk of the field- and non field-related impacts of concern in this analysis. The off-site SCE lines were also designed and are currently operated by SCE according to the same health and safety guidelines. Therefore, staff does not expect their post-modification use to pose a significant risk of the health and safety impacts at issue.

RECOMMENDATIONS

The CPUC requires that power line fields be maintained within existing levels in light of the present health concern, and has caused the utilities to more clearly specify the design and operational guidelines for achieving this goal. Therefore, staff considers it necessary to measure the post-modification field strengths to verify the guideline implementation necessary with respect to on-site replacement lines. Since the SCE lines are proposed for use without modification, such measurements would verify that post-modification fields levels would remain the same as expected for SCE lines of the same voltage and current-carrying capacity.

Given the noted compliance with existing safety and the field-related impacts of concern in this analysis, staff recommends that these project-related lines be approved by the Commission as proposed. If such approval is granted, staff would recommend adoption of the following conditions of certification to verify compliance with the applicable mitigation measures.

CONDITIONS OF CERTIFICATION

TLSN-1 The project owner shall ensure that the proposed on-site replacement lines (associated with Units, 5, 6, and 7) are designed and constructed in compliance with CPUC's GO-95, GO-52, Title 8, Section 2700 Sections 2700 through 2974 of the California Code of Regulations and SCE's EMF-reduction guidelines arising from CPUC Decision 93-11-013.

Verification: Thirty days before the start of line construction, the project owner shall submit to the Energy Commission Compliance Project Manager (CPM) evidence of their intention to comply with the above requirements.

TLSN-2 The project owner shall ensure that a qualified individual is engaged to measure the strengths of the project-related electric and magnetic in the post-modification period. Measurements should be made at the same points along the perimeter of the SCE Switchyard, within the route of the on-site replacement lines, and the route of the existing off-site SCE lines, for which field strength values were presented by the applicant.

Verification: The project owner shall ensure that the post-modification measurements are tabulated together with the pre-modification measurements presented by the applicant. A copy of these measurement results shall be filed with the CPM within 60 days after completion of the measurements.

REFERENCES

ESPR (El Segundo Redevelopment Project) 2000a. Application for Certification, Vols. 1-4. Submitted to the California Energy Commission, December 21 2000.

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

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

National Institute of Environmental Health Services 1998. An Assessment of the Health Effects from Exposure to Power-Line Frequency Electric and Magnetic Fields. A Working Group Report, August, 1998.

TRANSMISSION SYSTEM ENGINEERING

Testimony of Mark Hesters and Al McCuen

INTRODUCTION

The Transmission System Engineering (TSE) analysis identifies whether or not the transmission facilities associated with the proposed project conform to all applicable laws, ordinances, regulations and standards (LORS) required for safe and reliable electric power transmission and assesses whether or not the applicant has accurately identified all interconnection facilities required as a result of the project.

Staff's analysis evaluates the power plant switchyard, outlet line, termination and downstream facilities identified by the applicant and provides proposed conditions of certification to ensure the project complies with applicable LORS during the design review, construction, operation and potential closure of the project.

Additionally, under the California Environmental Quality Act (CEQA), the Energy Commission must conduct an environmental review of the "whole of the action," that may include facilities not licensed by the Energy Commission (California Code of Regulations (CCR), Title 14, §15378). Therefore, the Energy Commission must identify and evaluate the environmental effect of construction and operation of any new or modified transmission facilities required for the project's interconnection to the electric grid and also beyond the project's interconnection with the existing transmission system that are required as a result of the power plant addition to the California transmission system. The California Independent System Operator (Cal-ISO) is responsible for ensuring electric system reliability for all participating transmission owning utilities and determines both the standards necessary to achieve reliability and whether a proposed project conforms with those standards. The Cal-ISO will provide testimony on these matters at the Energy Commission's hearings.

Summary of Conclusions

The El Segundo Power II LLC (ESP II or the applicant) proposes to connect their El Segundo Power Redevelopment Project (El Segundo Project or the project), to the existing 230 kV transmission system. The power plant switchyard, outlet lines, and terminations are in accordance with good utility practices and are acceptable. Staff concludes that these facilities will comply with LORS, assuming the Conditions of Certification **TSE-1** through **TSE-7** are met. The applicant has committed to a specific transmission mitigation alternative and no foreseeable, significant downstream facilities will be attributed to the interconnection and operation of the El Segundo Project.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS

California Public Utilities Commission (CPUC) General Order 95 (GO-95), "Rules for Overhead Electric Line Construction", formulates uniform requirements for construction of overhead lines. Compliance with this order ensures adequate service and safety to persons engaged in the construction, maintenance, operation or use of overhead electric lines and to the public in general.

CPUC General Order 128 (GO-128), "Rules for Construction of Underground Electric Supply and Communications Systems," establishes uniform requirements and minimum standards to be used for underground supply systems to ensure adequate service and safety.

Western Systems Coordinating Council (WSCC) Reliability Criteria provides the performance standards used in assessing the reliability of the interconnected system. These Reliability Criteria require the continuity of service to loads as the first priority and preservation of interconnected operation as a secondary priority. The WSCC Reliability Criteria includes the Reliability Criteria for Transmission System Planning, Power Supply Design Criteria, and Minimum Operating Reliability Criteria. Analysis of the WSCC system is based to a large degree on WSCC Section 4 "Criteria for Transmission System Contingency Performance" which requires that the results of power flow and stability simulations verify established performance levels. Performance levels are defined by specifying the allowable variations in voltage, frequency and loading that may occur on systems other than the one in which a disturbance originated. Levels of performance range from no significant adverse effect outside a system area during a minor disturbance (loss of load or facility loading outside emergency limits) to a performance level that only seeks to prevent system cascading and the subsequent blackout of islanded areas. While controlled loss of generation, load, or system separation is permitted in extreme circumstances, their uncontrolled loss is not permitted (WSCC 1998).

North American Electric Reliability Council (NERC) Planning Standards provide policies, standards, principles and guides to assure the adequacy and security of the electric transmission system. With regard to power flow and stability simulations, these Planning Standards are similar to WSCC's Criteria for Transmission System Contingency Performance. The NERC planning standards provide for acceptable system performance under normal and contingency conditions, however the NERC planning standards apply not only to interconnected system operation but also to individual service areas (NERC 1998).

Cal-ISO's Reliability Criteria also provide policies, standards, principles and guides to assure the adequacy and security of the electric transmission system. With regard to power flow and stability simulations, these Planning Standards are similar to WSCC's Criteria for Transmission System Contingency Performance and the NERC Planning Standards. The Cal-ISO Reliability Criteria incorporate the WSCC Criteria and NERC Planning Standards. However, the Cal-ISO Reliability Criteria also provide some additional requirements that are not found in the WSCC Criteria or the NERC Planning Standards. The Cal-ISO Reliability Criteria apply to all existing and proposed facilities interconnecting to the Cal-ISO controlled grid.

Cal-ISO Scheduling Protocols and Dispatch Protocols require conformance with NERC, WSCC, and Local Area Reliability and Planning Criteria. These standards will be applied to the assessment of the system reliability implications of the Unit 7 project. Also of major importance to projects are the Cal-ISO Day/Hour Ahead Inter-zonal Congestion Management Scheduling Protocol (SP 10), the Transmission System Loss Management Scheduling Protocol (SP 4), and the Creation of the Real Time Merit Order Stack (SP 11). The Congestion Management Scheduling Protocol provides that the operation of power plants not violate system criteria when market participants request generation dispatch or the use of major interties. The Real Time Merit Order

Stack is developed based on increasing energy bid prices so that the least cost bids are accepted early on and if congestion is anticipated the highest bids are not selected. The Transmission System Loss Management Scheduling Protocol uses the Cal-ISO power flow model to identify total transmission losses at each generating unit and scheduling point. Additional calculations are performed to determine the actual net power output required by the generating units to meet their scheduled obligations. (Cal-ISO 1998a, Cal-ISO 1998b).

Cal-ISO Participating Generator Agreement consists of detailed explanations of the requirements in the Cal-ISO Tariff pertaining to the paralleled generating unit.

PROJECT DESCRIPTION

The El Segundo project would result in a net increase in the output of the existing El Segundo Generating Station by 280 MW, with the 350 MW existing Units 1 and 2 replaced by the new Units 5, 6, and 7 with a nominal net output of 630 MW. Units 3 and 4 will be re-rated from 604 MW to 670 MW as a result of the project. New transmission facilities are limited to those on site that would connect the new generating facilities with the on-site El Segundo substation. No new transmission lines would be required for the project. Two new generator lead lines would connect the switchyard to the existing El Segundo substation, located on site. The 230 kV lead lines would connect the 230 kV transformers in the switchyard with existing 230 kV equipment in the El Segundo substation. While the interconnection and operation of the project would require the replacement of circuit breakers and wave traps in the Southern California Edison transmission network, no significant downstream facilities have been identified as a reasonably foreseeable consequence of the El Segundo Project.

POWER PLANT SWITCHYARD

The on-site switchyard would be designed to conform to applicable industry standards and would include three new generator step-up transformers. The 230 kV circuit breakers, disconnect switches and surge arrestors would be appropriately sized as determined by the Detailed Facilities Study. No major new equipment is required for the El Segundo substation to accommodate the project. The onsite facilities would be owned, operated and maintained by the project owners (ESPR 2000a). Staff concludes that these facilities are acceptable.

TRANSMISSION LINE

Two new generator lead lines would connect the project switchyard to the existing El Segundo substation, located on site. The applicant would use 230 kV lead lines to connect the 230 kV transformers in the switchyard with the existing 230 kV equipment in the El Segundo substation. The conductor would be bundled 765-kcmil ACSR, each of which can carry a maximum load of 607 MVA and is appropriate for the project requirements. No new off site transmission facilities would be required to interconnect the project.

EXISTING FACILITIES AND RELATED SYSTEMS

The applicant proposes to connect the project to the existing El Segundo substation in the SCE service territory. Thus the project would interconnect to the center of the SCE

transmission network. As shown in the System Impact and Facility Studies for the project the operation of the El Segundo Project would impact many transmission facilities in the SCE transmission network although no significant downstream facilities will be required.

DOWNSTREAM IMPACTS¹

The project impacts on the transmission system downstream of the interconnection facilities are discussed in the System Reliability section. No new or modified transmission facilities beyond the project's interconnection with the existing transmission system are identified as a result of the power plant addition to the California transmission system.

ANALYSIS

SYSTEM RELIABILITY

Introduction

A system reliability study is performed to determine the effects of connecting a new power plant to the existing electric grid. The study identifies impacts and also ways negative impacts can be minimized or negated. Any new transmission facilities such as the power plant switchyard, the outlet line, and downstream facilities, required to connect a project to the grid are considered part of the project and are subject to review in the Application for Certification process. Based on the results of the Facilities Study and the subsequent letter from the applicant, staff has determined that the El Segundo Project will not cause significant line overloads under normal conditions. Transmission lines do overload under normal and emergency or outage conditions, which will require mitigation, but significant downstream facilities will not be required.

Scope of Reliability Studies

Power flow, short circuit and stability studies with and without the project are performed to determine conformance with reliability criteria established by NERC, WECC, and the Cal-ISO. The project is modeled in the studies with an additional plant delivery of 280 MW for power flow analysis. The study results provide snapshots of highly stressed operation and are not illustrative of month to month or day to day operation. Power flow studies included generators and utility expansion plans and were based on the assumption that the projects would be completed and generating power in the late spring of 2003. The status of potential new generators has changed several times since the first Facility Study was completed for the El Segundo Project and several potential plants located near El Segundo are no longer viable. As a result, SCE has updated the Facility Study once for the El Segundo Project and an updated study was filed at the CEC on May 21, 2002. The 2003 cases used as a basis for the studies are considered valid for the purpose of the Cal-ISO and TSE analysis.

¹ Downstream facilities are those that are beyond the point where the line emanating from the power plant joins with the (existing) interconnected system (see [California Public Utilities Commission v. California Energy Resources Conservation and Development Commission](#) (1984) 150 Cal. App. 3d 437 [197 Cal. Rptr. 866]).

Facilities Study Summary

The power flow study results indicate that, under the stressed conditions studied, an extensive list of existing line overloads would be slightly increased due to the project. In addition, a limited number of heavily loaded facilities would reach overload conditions with the addition of the project. The study describes four mitigation alternatives for the identified overloads (ESPR 2002x, pages 5 and 6). The applicant has committed to alternative 3 which uses Special Protection Systems and replaces equipment such as wave traps and circuit breakers that are within the fence line of existing facilities (ESPR 2002gg, page 1). Thus, no new or modified transmission facilities beyond the project's interconnection with the existing transmission system would be required as a result of the power plant addition. New and increased overloads are listed in the summary that follows:

Load flow analysis for Spring 2003 Transmission System Planning Model conditions

1. Under N-0 conditions, addition of the project increases four pre-existing overloads.
2. The project triggers three new overloads for N-1 contingencies.
3. The project increases seven existing overloads for N-1 contingencies.
4. The project triggers two new overloads for N-2 contingencies.
5. The project increases five existing overloads for N-2 contingencies.

Load flow analysis for Heavy Summer 2003 conditions

1. Under N-0 conditions, addition of the project increases two pre-existing overloads.
2. The project triggers three new overloads for N-1 contingencies.
3. The project increases three existing overloads for N-1 contingencies.
4. The project triggers one new overload for N-2 contingencies.
5. The project increases five existing overloads for N-2 contingencies.

The above list shows that the project increases already existing overloads on a great number of lines. Since the upgrade of these existing overloads will be triggered by other power plant projects the facilities associated with the upgrades are not required for the interconnection and operation of the El Segundo Project and as such are not a reasonably foreseeable consequence of this project. Overloads that are directly attributable to the project are limited to contingency overloads that will be mitigated with Special Protection Systems (SPS) that would reduce the output from the El Segundo Project under specified conditions. Staff concludes that there are no major system additions, beyond the interconnection facilities, required as a reasonably foreseeable consequence of the project. The applicant states a commitment to a remedial action scheme (RAS) and project re-design to avoid overload conditions that would trigger the need for significant new physical upgrades (ESPR 2002gg, page 1).

Short Circuit Study Results

Short circuit analyses are conducted to assure that existing and proposed breaker ratings are sufficient to withstand high levels of current during a fault (such as when a line touches the ground). The short circuit duty analysis found that 22 circuit breakers would need to be replaced due to the El Segundo Project. All post transient voltages

were within planning criteria for the critical contingencies tested. Breaker work and any substation equipment replacement will occur inside the fence lines of the existing substation. The fault duty studies were based on parameters provided by the applicant. The results could be significantly different if the actual parameters differ substantially from the data used in the Facilities Study. However, since circuit breaker replacement and new relays are considered a “within the fence” change for the project, the determination of actual parameters until after the Energy Commission’s decision on project certification is acceptable (ESPR 2000i).

Stability Study Results

Stability studies were performed to ensure that the transmission system remains stable during normal and abnormal operating conditions with the project connected to the system. Dynamic stability analysis found no new unstable system condition with addition of the project for either spring or summer cases (ESPR 2000i).

Cal-ISO Review

The Cal-ISO review of the applicant’s submittals supports the CEC staff’s analysis, states preliminary interconnection approval, and recommends further study for the EL Segundo Project (Cal-ISO 2001a). The Facility Study identified an alternative that will mitigate overloads with SPS and will not require the upgrade of existing transmission lines. The ESP II may be required to pay for some part of the physical reinforcements that are required to alleviate overloads, however those reinforcements are triggered by other new generators and would be required even if the EI Segundo project is not approved. That is, the project will be required to contribute to cost sharing of system reinforcements, however will not be considered to have solely triggered the need for physical reinforcements. No significant new downstream project facilities are likely to be identified as required to accommodate the project in the additional studies. The Cal-ISO will provide testimony on the Facilities Study Report and Supplemental Studies, will discuss the conclusions and analysis of the additional information requested in the preliminary approval letter, and will provide conclusions and findings in the Energy Commission’s hearings. The Cal-ISO final interconnection approval will assure conformance with NERC, WSCC and Cal-ISO reliability criteria.

Alternative Transmission Line Routes

Due to the use of existing on-site facilities, CEC staff concludes no alternatives would be feasible at the site that would vary significantly from the applicant’s proposed transmission interconnection (ESPR 2000a).

CUMULATIVE IMPACTS

Due to the large number of potential new generators in the SCE area there would be cumulative impacts associated with the interconnection and operation of the EI Segundo Project. The System Impact Study and the Facility Study both indicate that there are facility overloads caused by other proposed generators that would be exacerbated by the EI Segundo Project. However, whether or not these other generators will ever be permitted and operated is very uncertain.

Since the System Impact Study was completed for the EI Segundo Project in December 18, 2000, there have been significant changes in the generators proposed in the SCE

area. The Cal-ISO has recommended that the Facility Study, completed September 12, 2001, be updated because significant projects that were in the SCE new generator queue ahead of the El Segundo Project have since dropped out of the queue and are no longer expected to be built. Thus, while there could be cumulative transmission impacts caused by the combined operation of the El Segundo Project and other proposed projects, these potential impacts are highly speculative because of the uncertainty surrounding the other generators. Impacts caused by the El Segundo project will be mitigated as previously discussed.

FACILITY CLOSURE

PLANNED CLOSURE

This type of closure occurs in a planned and orderly manner such as at the end of its useful economic or mechanical life or due to gradual obsolescence. Under such circumstances, the owner is required to provide a closure plan 12 months prior to closure, which in conjunction with applicable LORS, is considered sufficient to provide adequately for safety and reliability. For instance, a planned closure provides time for the owner to coordinate with the Participating Transmission Owner (PTO), in this case SCE, to assure (as one example) that the PTO's system will not be closed into the outlet thus energizing the project substation. Alternatively, the owner may coordinate with the PTO to maintain some power service via the outlet line to supply critical station service equipment or other loads. The facility closure plan will address all such TSE issues.

UNEXPECTED TEMPORARY CLOSURE

An unplanned closure occurs when the facility is closed suddenly and/or unexpectedly for a short term due to unforeseen circumstances such as a natural or other disaster or emergency. During such a closure the facility cannot insert power into the utility system. Closures of this sort can be accommodated by establishing an on-site contingency plan (see **General Conditions Including Compliance Monitoring and Closure Plan**).

UNEXPECTED PERMANENT CLOSURE

This unplanned closure occurs when the project owner abandons the facility. This is considered to be a permanent closure. This includes unexpected closure where the owner remains accountable for implementing the on-site contingency plan. It can also include unexpected closure where the project owner is unable to implement the contingency plan, and the project is essentially abandoned. An on-site contingency plan will be developed to assure safety and reliability, and must be in place and approved by the Energy Commission's Compliance Project Manager (CPM) prior to the beginning of commercial operation of the facilities (see **General Conditions Including Compliance Monitoring and Closure Plan**).

CONCLUSIONS AND RECOMMENDATIONS

Staff concludes that no significant additional new transmission facilities, other than those proposed by the applicant, are required for the interconnection of the El Segundo Project to meet NERC, WSCC, and Cal-ISO reliability criteria.

The Cal-ISO has provided preliminary approval of the interconnection.

The power plant switchyard, outlet lines, and termination are acceptable and will comply with LORS assuming the proposed conditions of certification are implemented.

The issuance of the Cal-ISO's final interconnection approval will assure conformance with NERC, WSCC and Cal-ISO reliability criteria. Conditions of Certification TSE-5e and TSE-5f provide for Energy Commission review of the Cal-ISO's final interconnection approval letter and the SCE/applicant Generator Special Facilities Agreement.

Staff proposes the following conditions of certification to ensure system reliability and conformance with LORS.

CONDITIONS OF CERTIFICATION

Some of the Conditions of Certification in this section have been changed from the Preliminary Staff Assessment based on staff's efforts to standardize Conditions of Certification to the extent feasible based on recent experience in the certification and compliance process. These changes do not affect the substance of the requirements in the Condition. Other Conditions have been changed based on stipulated agreements between staff and the applicant. All of the modified Conditions are supported by the analysis outlined in the text above.

TSE-1 The project owner shall furnish to the CPM and to the CBO a schedule of transmission facility design submittals, a Master Drawing List, a Master Specifications List, and a Major Equipment and Structure List. The schedule shall contain a description and list of proposed submittal packages for design, calculations, and specifications for major structures and equipment. To facilitate audits by Energy Commission staff, the project owner shall provide designated packages to the CPM when requested.

Verification: At least 60 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of construction, the project owner shall submit the schedule, a Master Drawing List, and a Master Specifications List to the CBO and to the CPM. The schedule shall contain a description and list of proposed submittal packages for design, calculations, and specifications for major structures and equipment (see a list of major equipment in **Table 1: Major Equipment List** below). Additions and deletions shall be made to the table only with CPM and CBO approval. The project owner shall provide schedule updates in the Monthly Compliance Report.

Table 1: Major Equipment List
Breakers
Step-up Transformer
Switchyard
Busses
Surge Arrestors
Disconnects
Take off facilities
Electrical Control Building
Switchyard Control Building
Transmission Pole/Tower
Grounding System

TSE-2 Prior to the start of construction the project owner shall assign an electrical engineer and at least one of each of the following to the project: A) a civil engineer; B) a geotechnical engineer or a civil engineer experienced and knowledgeable in the practice of soils engineering; C) a design engineer, who is either a structural engineer or a civil engineer fully competent and proficient in the design of power plant structures and equipment supports; or D) a mechanical engineer. (Business and Professions Code Sections 6704 et seq., require state registration to practice as a civil engineer or structural engineer in California.)

The tasks performed by the civil, mechanical, electrical or design engineers may be divided between two or more engineers, as long as each engineer is responsible for a particular segment of the project (e.g., proposed earthwork, civil structures, power plant structures, equipment support). No segment of the project shall have more than one responsible engineer. The transmission line may be the responsibility of a separate California registered electrical engineer. The civil, geotechnical or civil and design engineer assigned in conformance with Facility Design condition **GEN-5**, may be responsible for design and review of the TSE facilities.

The project owner shall submit to the CBO for review and approval, the names, qualifications and registration numbers of all engineers assigned to the project. If any one of the designated engineers is subsequently reassigned or replaced, the project owner shall submit the name, qualifications and registration number of the newly assigned engineer to the CBO for review and approval. The project owner shall notify the CPM of the CBO's approval of the new engineer. This engineer shall be authorized to halt earthwork and to require changes; if site conditions are unsafe or do not conform with predicted conditions used as a basis for design of earthwork or foundations.

The electrical engineer shall:

1. Be responsible for the electrical design of the power plant switchyard, outlet and termination facilities; and
2. Sign and stamp electrical design drawings, plans, specifications, and calculations.

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

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

TSE-3 If any discrepancy in design and/or construction is discovered in any engineering work that has undergone CBO design review and approval, the project owner shall document the discrepancy and recommend corrective action. (1998 CBC, Chapter 1, Section 108.4, Approval Required; Chapter 17, Section 1701.3, Duties and Responsibilities of the Special Inspector; Appendix Chapter 33, Section 3317.7, Notification of Noncompliance]. The discrepancy documentation shall become a controlled document and shall be submitted to the CBO for review and approval and shall reference this condition of certification.

Verification: The project owner shall submit a copy of the CBO's approval or disapproval of any corrective action taken to resolve a discrepancy to the CPM within 15 days of receipt. If disapproved, the project owner shall advise the CPM, within five days, the reason for disapproval, and the revised corrective action required to obtain the CBO's approval.

TSE-4 For the power plant switchyard, outlet line and termination, the project owner shall not begin any increment of construction until plans for that increment have been approved by the CBO. These plans, together with design changes and design change notices, shall remain on the site for one year after completion of construction. The project owner shall request that the CBO inspect the installation to ensure compliance with the requirements of applicable LORS. The following activities shall be reported in the Monthly Compliance Report:

- a) receipt or delay of major electrical equipment;
- b) testing or energization of major electrical equipment; and
- c) the number of electrical drawings approved, submitted for approval, and still to be submitted.

Verification: At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of each increment of construction, the project owner shall submit to the CBO for review and approval the final design plans, specifications and calculations for equipment and systems of the power plant switchyard, outlet line and termination, including a copy of the signed and stamped statement from the responsible electrical engineer attesting to compliance with the applicable LORS, and send the CPM a copy of the transmittal letter in the next Monthly Compliance Report.

TSE-5 The project owner shall ensure that the design, construction and operation of the proposed transmission facilities will conform to all applicable LORS, including

the requirements listed below. The substitution of CPM and CBO approved “equivalent” equipment and equivalent substation configurations is acceptable. The project owner shall submit the required number of copies of the design drawings and calculations as determined by the CBO.

- a) The power plant switchyard and outlet line shall meet or exceed the electrical, mechanical, civil and structural requirements of CPUC General Order 95 or National Electric Safety Code (NESC), Title 8 of the California Code and Regulations (Title 8), Articles 35, 36 and 37 of the “High Voltage Electric Safety Orders”, National Electric Code (NEC) and related industry standards.
- b) Breakers and busses in the power plant switchyard and other switchyards, where applicable, shall be sized to comply with a short-circuit analysis.
- c) Outlet line crossings and line parallels with transmission and distribution facilities shall be coordinated with the transmission line owner and comply with the owner’s standards.
- d) The project conductors shall be sized to accommodate the full output from the project.
- e) Termination facilities shall comply with applicable SGD&E interconnection standards.
- f) The project owner shall provide:
 - i) The final Detailed Facility Study (DFS) including a description of facility upgrades, operational mitigation measures, and/or Special Protection System (SPS) sequencing and timing if applicable,
 - ii) Executed Facility Interconnection Agreement
 - iii) Verification of Cal-ISO Notice of Synchronization.

Verification: At least 60 days prior to the start of construction of transmission facilities (or a lesser number of days mutually agree to by the project owner and CBO, the project owner shall submit to the CBO for approval:

- a) Design drawings, specifications and calculations conforming with CPUC General Order 95 or NESC, Title 8, Articles 35, 36 and 37 of the “High Voltage Electric Safety Orders”, NEC, applicable interconnection standards and related industry standards, for the poles/towers, foundations, anchor bolts, conductors, grounding systems and major switchyard equipment.
- b) For each element of the transmission facilities identified above, the submittal package to the CBO shall contain the design criteria, a discussion of the calculation method(s), a sample calculation based on “worst case conditions”² and a statement signed and sealed by the registered engineer in responsible charge, or other acceptable alternative verification, that the transmission element(s) will conform with CPUC General Order 95 or NESC, Title 8, California Code of Regulations, Articles 35, 36 and 37 of the, “High Voltage

² Worst case conditions for the foundations would include for instance, a dead-end or angle pole.

Electric Safety Orders”, NEC, applicable interconnection standards, and related industry standards.

- c) Electrical one-line diagrams signed and sealed by the registered professional electrical engineer in responsible charge, a route map, and an engineering description of equipment and the configurations covered by requirements **TSE-5** a) through f) above.
- d) The DFS operational mitigation measures, SPS, and executed Facility Interconnection Agreement shall be provided concurrently to the CPM and CBO. Substitution of equipment and substation configurations shall be identified and justified by the project owner for CBO approval.

TSE-6 The project owner shall inform the CPM and CBO of any impending changes, which may not conform to the requirements **TSE-5** a) through f), and have not received CPM and CBO approval, and request approval to implement such changes. A detailed description of the proposed change and complete engineering, environmental, and economic rationale for the change shall accompany the request. Construction involving changed equipment or substation configurations shall not begin without prior written approval of the changes by the CBO and the CPM.

Verification: At least 60 days prior to the construction of transmission facilities, the project owner shall inform the CBO and the CPM of any impending changes which may not conform to requirements of **TSE-5** and request approval to implement such changes.

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

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

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

TSE-8 The project owner shall be responsible for the inspection of the transmission facilities during and after project construction, and any subsequent CPM and CBO approved changes thereto, to ensure conformance with CPUC GO-95 or NESC, Title 8, CCR, Articles 35, 36 and 37 of the, “High Voltage Electric Safety Orders”, applicable interconnection standards, NEC and related industry standards. In case of non-conformance, the project owner shall inform the CPM

and CBO in writing, within 10 days of discovering such non-conformance and describe the corrective actions to be taken.

Verification: Within 60 days after first synchronization of the project, the project owner shall transmit to the CPM and CBO:

- a) “As built” engineering description(s) and one-line drawings of the electrical portion of the facilities signed and sealed by the registered electrical engineer in responsible charge. A statement attesting to conformance with CPUC GO-95 or NESC, Title 8, California Code of Regulations, Articles 35, 36 and 37 of the, “High Voltage Electric Safety Orders”, and applicable interconnection standards, NEC, related industry standards, and these conditions shall be provided concurrently.
- b) An “as built” engineering description of the mechanical, structural, and civil portion of the transmission facilities signed and sealed by the registered engineer in responsible charge or acceptable alternative verification. “As built” drawings of the mechanical, structural, and civil portion of the transmission facilities shall be maintained at the power plant and made available, if requested, for CPM audit as set forth in the “Compliance Monitoring Plan”.
- c) A summary of inspections of the completed transmission facilities, and identification of any nonconforming work and corrective actions taken, signed and sealed by the registered engineer in charge.

REFERENCES

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

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

Cal-ISO (California Independent System Operator) 2001. California ISO’s comments regarding the System Impact Studies and Detailed Facilities Study Report. Letter from Jeff Miller, dated April 4, 2001. Revised May 10, 2001.

ESPR (El Segundo Power Station) 2000a – Application for Certification Submitted to the California Energy Commission on December 18, 2000.

ESPR (El Segundo Power Station) 2000h – Supplement information areas: Project Description, Biological Resources, Water Resources, Traffic and Transportation, Visual Resources, Transmission System Engineering, Socioeconomic and Worker Safety Submitted to California Energy Commission on January 18, 2001.

ESPR (El Segundo Power Station) – 2000i – System Interconnect Study submitted to the California Energy Commission on February 8, 2001.

ESPR (El Segundo Power Station) – 2001 – Record of Telephone conversation between CEC staff and the legal counsel for the applicant, John McKinsey. The

applicant reports that RAS is planned to avoid overloads over upgrades of the overhead/underground or other transmission lines, and in the event that RAS developed for the full plant output will not meet required criteria for transmission system reliability, the project is committed to modification of the generation project design to make RAS work and thereby avoid physical upgrades to transmission lines. April 26, 2001.

ESPR (El Segundo Power Station) – 2002x – Facilities Study submitted to the California Energy Commission on May 21, 2002.

ESPR (El Segundo Power Station) – 2002gg – Letter choosing Alternative 3 described in the Facilities Study, submitted to the California Energy Commission on July 30, 2002.

NERC (North American Electric Reliability Council). 1998. NERC Planning Standards, September 1997.

WSCC (Western Systems Coordinating Council) 1997. Reliability Criteria, August 1998.

DEFINITION OF TERMS

AAC All Aluminum conductor.

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

Ampere The unit of current flowing in a conductor.

Bundled Two wires, 18 inches apart.

Bus Conductors that serve as a common connection for two or more circuits.

Conductor The part of the transmission line (the wire) which carries the current.

Congestion Management

Congestion management is a scheduling protocol, which provides that dispatched generation and transmission loading (imports), will not violate criteria.

Emergency Overload

See Single Contingency. This is also called an L-1.

Kcmil or kcm

Thousand circular mil. A unit of the conductor's cross sectional area, when divided by 1,273, the area in square inches is obtained.

Kilovolt (kV)

A unit of potential difference, or voltage, between two conductors of a circuit, or between a conductor and the ground.

Loop An electrical cul de sac. A transmission configuration which interrupts an existing circuit, diverts it to another connection and returns it back to the interrupted circuit, thus forming a loop or cul de sac.

Megavar One megavolt ampere reactive.

Megavars Mega-volt-Ampere-Reactive. One million Volt-Ampere-Reactive.

Reactive power is generally associated with the reactive nature of motor loads that must be fed by generation units in the system.

Megavolt ampere (MVA)

A unit of apparent power, equals the product of the line voltage in kilovolts, current in amperes, the square root of 3, and divided by 1000.

Megawatt (MW)

A unit of power equivalent to 1,341 horsepower.

Multiple Contingencies

A condition that occurs when more than one major transmission element (circuit, transformer, circuit breaker, etc.) or more than one generator is out of service

Normal Operation/ Normal Overload

When all customers receive the power they are entitled to without interruption and at steady voltage, and no element of the transmission system is loaded beyond its continuous rating.

N-1 Condition

See Single Contingency.

Outlet Transmission facilities (circuit, transformer, circuit breaker, etc.) linking generation facilities to the main grid.

Power Flow Analysis/FS

A power flow analysis/FS is a forward looking computer simulation of essentially all generation and transmission system facilities that identifies overloaded circuits, transformers and other equipment and system voltage levels.

Reactive Power

Reactive power is generally associated with the reactive nature of motor loads that must be fed by generation units in the system. An adequate supply of reactive power is required to maintain voltage levels in the system.

Remedial Action Scheme (RAS)

A remedial action scheme is an automatic control provision, which, for instance, will trip a selected generating unit upon a circuit overload.

SF6 Sulfur hexafluoride is an insulating medium.

Single Contingency

Also known as emergency or N-1 condition, occurs when one major transmission element (circuit, transformer, circuit breaker, etc.) or one generator is out of service.

Solid dielectric cable

Copper or aluminum conductors that are insulated by solid polyethylene type insulation and covered by a metallic shield and outer polyethylene jacket.

Switchyard A power plant switchyard (switchyard) is an integral part of a power plant and is used as an outlet for one or more electric generators.

Thermal rating

See ampacity.

TSE Transmission System Engineering.

Undercrossing

A transmission configuration where a transmission line crosses below the conductors of another transmission line, generally at 90 degrees.

Underbuild

A transmission or distribution configuration where a transmission or distribution circuit is attached to a transmission tower or pole below (under) the principle transmission line conductors.

VISUAL RESOURCES

Testimony of William Kanemoto and Eric Knight

INTRODUCTION

The following analysis evaluates potential visual impacts of the El Segundo Power Redevelopment Project (ESPR), its consistency with applicable laws, ordinances, regulations, and standards (LORS), and conformance with applicable guidelines of the California Energy Commission and the California Environmental Quality Act.

Because potential project impacts of the ESPR have been evaluated against the baseline of strong existing visual impacts of the El Segundo Generating Station (ESGS), few significant impacts were identified under CEQA. However, staff does not regard either the existing ESGS or the unmitigated ESPR as visually compatible with their scenic coastal setting as viewed from high sensitivity foreground viewpoints on Vista Del Mar and Dockweiler and Manhattan State Beaches. The California Coastal Commission concurred with this opinion, finding the project setting to be “visually degraded, due in large part to the presence of the [existing] facility,” pursuant to Section 30251 of the Coastal Act. The Coastal Commission recommended that specific provisions, reproduced in Condition of Certification **VIS-1**, be implemented if the project is certified, pursuant to Section 25523(b) of the Warren-Alquist Act. These provisions call for the enhancement of views of the facility from areas accessible to the public. The Coastal Commission letter providing its findings relating to the visual resource impacts of the ESPR is reproduced in Appendix VR-2.

With implementation of the applicant’s proposed Tank Farm Plan (ESPR 2000x) and staff’s recommended Conditions of Certification **VIS-6** through **VIS-9**, all significant project impacts would be mitigated to less than significant levels.

Similarly, with implementation of the proposed Tank Farm Plan and staff-recommended Conditions of Certification **VIS-1**, **VIS-2**, **VIS-3**, **VIS-4**, and **VIS-5**, visual/aesthetic characteristics of the project site as seen from sensitive foreground viewpoints would be enhanced, and the project would conform with all applicable LORS. The applicant’s visual mitigation plans as currently proposed are not adequate to meet these requirements, so the project as currently proposed does not yet meet the requirements of the California Coastal Act.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

FEDERAL

The project is not located on federal lands and thus is not subject to federal land management regulations. Consequently, no federal LORS pertaining to visual resources apply to the project.

STATE

California Coastal Act

Provisions of the California Coastal Act apply to the proposed project, which is located within the coastal zone (Pub. Resources Code, Division 20, §§ 30000 et seq.). Authority for implementation of the Coastal Act is delegated to the local jurisdiction under a Local Coastal Program (LCP) approved and certified by the State Coastal Commission. The City of El Segundo's Coastal Zone Specific Plan has been certified by the Coastal Commission as its LCP. The Coastal Act states that "(T)he scenic and visual qualities of coastal areas shall be considered and protected as a resource of public importance. Permitted development shall be sited and designed to protect views to and along the ocean and scenic coastal areas, to minimize the alteration of natural land forms, to be visually compatible with the character of surrounding areas, and, where feasible, to restore and enhance visual quality in visually degraded areas" (Pub. Resources Code, §30251).

Section 30413 of the Coastal Act requires the Coastal Commission to prepare a consistency and suitability report to the Energy Commission on any new power generating facility proposed to be located within the designated Coastal Zone (Pub. Resources Code §30413). The consistency and suitability report includes findings on the "conformance of the proposed site and related facilities with the certified coastal programs in those jurisdictions which would be affected by any such development" (Pub. Resources Code §30413 (d)(5)).

The Coastal Commission has the lead responsibility for determining a power plant's consistency and suitability with the Coastal Act. Under the Warren-Alquist Act, the the Energy Commission must include in its decision the provisions recommended by the Coastal Commission in its section 30413 report unless the Energy Commission determines that adoption of these provisions would result in a greater adverse effect on the environment or that the provisions would not be feasible for the project (Pub. Resources Code, §25523(b)).

LOCAL

City of El Segundo

Local Coastal Program

The City of El Segundo has adopted a Coastal Zone Specific Plan which was certified by the California Coastal Commission as its Local Coastal Program in 1982 (City of El Segundo, 1980). Section VI.L., Visual Resources and Special Communities states that the City General Plan land use element contains policies which apply to industrial areas and which address scenic and visual qualities. The discussion further states that "existing City plans are fully adequate to protect scenic and visual resources in the coastal zone (ibid, p.11)." Applicable policies and objectives of the General Plan include:

General Plan – Land Use Element

Policy LU5-2.1.

New industrial developments shall provide landscaping in parking areas and around the buildings. This landscaping is to be permanently maintained.

Policy LU5-2.2.

All outdoor storage shall be properly screened by masonry walls and landscaping.

Objective LU5-3.

Encourage the rehabilitation of existing substandard blighted industrial areas through the combined efforts of private and public sectors.

Policy LU5-3.1.

Revitalize and upgrade industrial areas which contain aesthetic or functional deficiencies in such areas as landscaping, off-street parking, or loading areas.

Policy LU7-2.2.

Continue long-term programs in conjunction with Southern California Edison and the Los Angeles Department of Water and Power for eventually placing all utilities that they are responsible for underground.

El Segundo Zoning Code Title 15, Chapter 2, General Provisions

Section 15-2-14.

Specifies landscaping requirements applying to vehicular use areas, property perimeters, and building perimeters.

City of Manhattan Beach

The proposed ESPR would be constructed entirely within the City of El Segundo, thus policies of the City of Manhattan Beach would not apply. However, the following General Plan policy and goal indicate the City's intent with regard to the potentially affected residential area south of the ESGS.

Land Use Policy 5.2.

Require the separation or buffering of low density residential areas from businesses that produce noise, odors, high traffic volumes, light or glare, and parking through the use of landscaping, setbacks, and other techniques.

LU Goal 7.

Protect existing residential neighborhoods from the intrusion of inappropriate and incompatible uses.

VISUAL ANALYSIS METHODOLOGY

The following discussion describes the evaluation methodology employed in the visual resource analysis of the proposed ESPR. This methodology was developed by Energy Commission staff and applied on numerous previous power plant siting cases, and is fundamentally consistent with similar professionally accepted visual assessment techniques employed by various government agencies.

In the following analysis the project's visual setting is described in terms of existing visual character and quality. Visual character refers to formal attributes of the visual setting and is descriptive. Visual quality is an evaluative measure that reflects a judgment of a landscape's attractiveness as determined by characteristics broadly recognized as valued and preferred by most viewers. These include the presence of natural features, particularly vegetation and water, and visual attributes typically identified as preferred or valued in various professionally accepted assessment methodologies, such as distinctiveness, coherence, intactness, variety and interest. The project setting was delineated into areas or landscape units of contiguous, broadly consistent visual character and quality. These correspond broadly with land uses as well as typical physiographic characteristics and are also referred to as image types.

Within each landscape type, Key Observation Points (KOPs) were then identified to represent the most critical locations from which the project would be seen and reflect, in particular, those key sensitive viewer groups most likely to be affected. Assessments of project impact are determined from these KOPs.

The visual characteristics of the project are then described. Typically, visual simulations of the project as seen from KOPs, accurately representing the perceived scale of the project from these locations, are required, as described further below.

The Energy Commission staff's visual assessment methodology evaluates impact to a particular KOP in terms of two primary factors: Overall Visual Sensitivity and Overall Visual Change.

Visual Sensitivity captures those aspects of viewers and their setting that determine the likelihood of adverse impact. The fundamental elements of sensitivity include:

- **visual quality** – The evaluation of the existing visual quality of the setting.
- **viewer concern** – A measurement of the level of viewer interest (viewer attitudes and expectations) regarding the visual resources in an area. It is often correlated with viewer activity type (e.g., certain activities, such as recreation, are generally considered to have high concern, while others, such as work-related activities, are generally considered to have lower concern). Residences are generally considered to have high concern. Expressions of public policy with regard to visual resources are given great weight in determining viewer concern.
- **viewer exposure** – The visibility of a landscape feature, the viewing distance to the landscape feature, the number of viewers, and the duration of the view all affect the exposure of viewers to a given landscape feature.

Overall visual sensitivity is rated on a scale of low to high. Thus, high visual quality, high viewer concern, and high viewer exposure to the project combine to create high overall visual sensitivity.

Overall Visual Change captures the degree of visual change expected as a result of the project. The fundamental elements of visual change include:

- **visual contrast** – The conspicuousness or prominence of a project, and its compatibility with its setting, is primarily a function of its contrast with that setting. Contrast is described in terms of formal attributes of form, line, color, and texture of the project in comparison to those of the setting.
- **visual dominance** – In the context of this methodology, dominance refers to the project's apparent size and scale within the field of view and in comparison to other objects in the field of view. A project's dominance is affected by its relative location in the field of view and the distance between the viewer and the project.
- **view blockage/intrusion** – View blockage describes the extent to which any previously visible landscape features are blocked from view by the project. View blockage of existing scenic views is a criterion for determining significant visual impacts under the CEQA Guidelines. View blockage is assigned greater weight according to the quality of the blocked view.

Overall visual change is rated on a scale of Negligible to Very Strong.

Overall visual sensitivity and overall visual change ratings are then combined to arrive at preliminary findings of potential project impact significance.

In addition, the project is evaluated for conformance with applicable LORS. Adopted expressions of local public policy pertaining to visual resources are also given great weight in determining both visual quality and viewer concern.

As needed, conditions of certification are proposed to reduce potentially significant impacts to less than significant levels and to ensure compliance with applicable LORS.

SIGNIFICANCE CRITERIA

The following regulatory criteria were considered in determining whether a visual impact would be significant. Technical criteria for determining the significance of the visual impacts of water vapor plumes are discussed below.

State

The CEQA Guidelines define a “significant effect” on the environment to mean a “substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project including . . . objects of historic or aesthetic significance” (Cal. Code Regs., tit.14, § 15382).

Appendix G of the Guidelines, under Aesthetics, lists the following four questions to be addressed regarding whether the potential impacts of a project are significant.

1. Would the project have a substantial adverse effect on a scenic vista?

2. Would the project substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?
3. Would the project substantially degrade the existing visual character or quality of the site and its surroundings?
4. Would the project create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?

Local

Energy Commission staff considers any local goals, policies, or designations regarding visual resources. Conflicts with such laws, ordinances, regulations, and standards can constitute significant visual impacts. See the section on Compliance with Applicable LORS, below.

Professional Standards

Professionals in visual impact analysis have developed a number of questions as a means of evaluating the potential significance of visual impacts (see, e.g., Smardon et al. 1986). The questions listed below address issues commonly raised in visual analyses for energy facilities. Staff considers these questions in assessing whether a project would cause a significant impact in regard to any of the four CEQA criteria listed above.

1. Will the project substantially alter the existing viewshed, including any changes in natural terrain?
2. Will the project deviate substantially from the form, line, color, and texture of existing elements of the viewshed that contribute to visual quality?
3. Will the project eliminate or block views of valuable visual resources?
4. Will the project result in significant amounts of backscatter light into the nighttime sky?
5. Will the project be in conflict with directly-identified public preferences regarding visual resources?
6. Will the project result in a significant reduction of sunlight, or the introduction of shadows, in areas used extensively by the community?
7. Will the project result in a substantial visible exhaust plume?

Vapor Plume Impact Criteria

Visual impacts of vapor plumes are more difficult to evaluate than structures because they vary in both size and duration depending upon operating and meteorological conditions. Vapor plumes are generally associated with heavy industrial land uses and thus tend to be regarded negatively by visually sensitive observers.

A plume frequency of 10% of seasonal (November through April) daylight no rain/no fog hours is used as an initial plume impact threshold trigger. If the frequency threshold is exceeded, a visual impact analysis of the plumes is conducted. Based on the predicted

dimensions (height, length, and width) of plumes, staff assesses the level of visual change that would be caused by the plumes in terms of their visual contrast, dominance, and view blockage. The determination of whether the plumes would cause significant visual impacts is made after consideration of the level of visual sensitivity of the existing setting and the level of visual change anticipated.

Due to the recreational land uses adjacent to the ESGS and the very high scenic quality and sensitivity of affected foreground portions of the coastal zone, acceptable levels of visual impact and frequency for industrial plumes under today's typical standards of both professional visual assessment and general popular sentiment, would be relatively low. These contemporary standards are reflected in the criteria for determining plume impact that have been described above. The criteria applied here for evaluating plume impacts are comparable to those that would be typically applied in other visually sensitive, high quality urban landscapes in the state.

SETTING

REGIONAL SETTING

The existing ESGS project is located on the coast of Santa Monica Bay in the City of El Segundo, Los Angeles County, approximately 1-1/2 miles south of the Los Angeles International Airport (LAX). The project site is situated at the foot of a coastal bluff west of Vista del Mar, directly overlooking Dockweiler and Manhattan Beach State Parks, which are parts of a system of public beaches along Santa Monica Bay extending for miles to the north and south. Immediately north of the project and on the west side of Vista del Mar is the adjacent Chevron ocean marine terminal and the Scattergood Power Plant staging facility. From the vicinity of the project site to the northern boundary of LAX approximately three miles to the north, Vista del Mar follows the western edge of the elevated coastal bluff, affording outstanding, panoramic, largely unimpeded views of the entire Santa Monica Bay to the northwest, west, and south. By contrast, views from Vista del Mar to the east are generally blocked near the road edge by terrain or structures. From the project site southward, views to the Bay from Vista del Mar are blocked by developed portions of the existing ESGS site and fencing surrounding the adjacent tank farm site to its south, and then by continuous residential and commercial development in the City of Manhattan Beach. Bay views are available however, from publicly accessible local streets and parking lots to the west in and adjacent to Manhattan Beach State Park.

PROJECT SITE

The ESPR is located within the existing ESGS in the approximate location of the existing Units 1 and 2 power block, which would be demolished and replaced by the proposed Units 5, 6 and 7. The proposed Units 5, 6, and 7 location occupies the northernmost portion of the ESGS facility. In addition, the adjacent former Southern California Edison tank farm located directly south of the ESGS has been acquired by ESGS and would serve as the laydown and staging location for construction of the project. The site occupies a portion of the coast of Santa Monica Bay, at the foot of a tall coastal bluff (approximately 90 feet tall in the project vicinity) that extends for much of the Bay coastline.

The site is visually characterized by two large power blocks, Units 1 and 2, and Units 3 and 4, whose tall exhaust stacks and frequent vapor plumes are visible to background distances of 3 miles in unimpeded views within the viewshed. The existing Units 3 and 4 occupy the southern portion of the ESGS site, with a top-of-power block elevation of 156 feet, and a top-of-exhaust stack height of 215 feet. The existing Units 1 and 2, to be replaced, occupy the northern portion of the ESGS site with a top-of-power block height of 157 feet and a top of stack height of 224 feet. Thus, both existing power blocks extend far above the top of the bluff and Vista del Mar, which occupies the bluff's edge. Both existing structures present visually chaotic views of fully exposed industrial machinery, piping, ductwork and scaffolding. They contrast strongly with their highly scenic coastal setting and with the general visual character of other industrial and residential land uses in the surrounding viewshed. The ESGS currently has landscape screening of 8 feet to 10 feet in height on most of its eastern (Vista del Mar) perimeter, which helps screen and soften the presence of the power plants from the immediate foreground but does little to screen views of the taller power blocks and stacks. A number of taller fan palms are located near the ESGS entrance near the southern boundary of the site but are too few in number and extent to provide significant screening of the tall power plant features. A 450-foot-long landscaped area also borders the site to the west of existing Units 1 and 2. Further visual detail of the site is provided in the discussion of particular foreground KOPs, below.

PROJECT AREA SETTING

Key Observation Points (KOPs): Visual character and Quality, Viewer Concern, and Viewing Conditions

The *viewshed* or area of potential visual effect (the area within which the project could potentially be seen) is delineated in **VISUAL RESOURCES Figure 1**, Project Viewshed: Landscape Units and KOPs. As depicted in that figure, the viewshed is restricted to a narrow strip of the coastal zone, enclosed immediately to the east of Vista del Mar by terrain and existing development, but extending to background distances to the north, west and south.

ESGS power plant stacks and vapor plumes are visible to background distances (roughly 3 miles) from Vista del Mar to the north, though such views tend to be dominated by the larger, nearer Scattergood Power Plant. They are also visible to background distances from beaches to the north and south.

The following discussion subdivides the viewshed into landscape types, or areas of broadly uniform visual character and quality, to provide an overview of the existing setting. Visual character and quality as they affect specific KOPs are discussed in detail under each KOP.

All figures referred to in the text may be found at the end of this section.

As delineated in **VISUAL RESOURCES Figure 1**, the viewshed is divided into the coastal industrial zone within which the ESGS itself is located; coastal open space,

encompassing the areas with unimpeded views to Santa Monica Bay; and coastal residential-commercial development of Manhattan Beach.

KOP numbers from the AFC and subsequent Data Responses have been retained, but the order of discussion has been changed to correspond to the organization of this analysis.

Unit 1 - Coastal Industrial Landscape

As depicted in **VISUAL RESOURCES Figure 1**, the project setting, although broadly set within the scenic coastal zone, occupies a portion of an extensive coastal heavy industrial area extending to the east and west of Vista del Mar from 45th Street in Manhattan Beach to Grand Street in El Segundo, and to the east of Vista del Mar from Grand Street north to Imperial Highway, approximately 1-1/2 miles to the north of the ESGS site. Industrial uses within this area include the adjacent Chevron marine loading facility immediately to the north of the ESGS, the Chevron Refinery to the east, and the Los Angeles Department of Water and Power (LADWP) Scattergood Power Plant, and the Hyperion Wastewater Treatment facility to the north. The entire designated coastal zone within the City of El Segundo, bounded to the east by Vista del Mar, consists of the aforementioned industrial uses. Public coastal access to the beach west of the ESGS is provided via a County-managed bike path immediately west of the power plant and loading facility. Beach access within the City of El Segundo is available only at Grand Street and Vista del Mar, north of the Chevron marine terminal. Other access in the vicinity includes 45th Street and other local streets within the City of Manhattan Beach south of the ESGS.

Despite these industrial uses, existing visual quality of the area is mixed and often good as seen from key viewpoints, notably from Vista del Mar. Between Grand Avenue and 45th Street, the entire Chevron site to the east is substantially screened by a very tall, wide, heavily landscaped berm. Industrial facilities of the refinery are reasonably well-screened from Vista del Mar and the vicinity, and the landscaped berm and setback contribute to an attractive roadway corridor character (**VISUAL RESOURCES Figure 2**, Industrial Facilities in the Project Viewshed). From Imperial Highway to the Chevron marine terminal, views westward to Santa Monica Bay from Vista del Mar are generally unimpeded. East of Vista del Mar between Imperial Highway and ESGS, the Hyperion waste treatment facility, though obviously industrial and very extensive, has been treated with architectural and landscape screening measures at the western boundary that conceal much of the plant's functional apparatus and create a degree of visual unity. Similarly, the Scattergood power plant, though obviously industrial and highly exposed to view, is housed within a building-style enclosure, albeit characterized by extremely prominent, red and white striped exhaust stacks. North of this industrial zone, facilities of LAX are almost entirely concealed by tall, vegetated sand dunes.

In the immediate vicinity of the ESGS, views from Vista del Mar to the Bay are largely blocked by a combination of the power plant facilities and perimeter landscape screening. The latter contribute to blocking of Bay views, but also reduce the industrial character of the power plants as seen from these foreground viewpoints, though they do not screen upper portions of the facilities. The effects of the screening are therefore

mixed. The ESGS power blocks and stacks are the only features within the wider viewshed which have sky-line views from Vista del Mar to Santa Monica Bay.

KOPs: No KOPs were identified within this landscape type, because potential viewers in these locations were presumed to have low visual sensitivity or concern with project impacts due to the industrial, work-related nature of their activities.

Unit 2 - Coastal Open Space

As described previously, this portion of the viewshed consists primarily of public beaches and adjacent Vista del Mar. Visual quality is very high, characterized by highly intact, panoramic views of Santa Monica Bay, which extend to the horizon to the north, west, and south and include views of beaches and surrounding mountains. From the public beaches, which occupy the entire coastline within the viewshed, views tend to be partially enclosed to the east by the coastal bluff face, further emphasizing seaward views. Views from Vista del Mar, which follows the bluff edge throughout the entire viewshed from the boundary of the City of Manhattan Beach to background distances to the north, are enhanced by its elevated position.

KOP 1 - Dockweiler Beach

VISUAL RESOURCES Figure 3A depicts the view toward the site from Dockweiler Beach State Park from a distance of approximately 1/2 mile looking south. Dockweiler Beach State Park receives very heavy use throughout much of the year. Views of the ESGS are unimpeded and the facility can appear co-dominant with the LADWP Scattergood Power Plant in this general area of use.

Visual Quality - Despite the prominence of the existing ESGS facility, the visual quality at this KOP is high due to the open panoramic views of the Bay. Slopes east of the beach in the foreground of the Chevron marine loading facility are heavily landscaped.

Viewer Concern - Viewer concern is considered high due to the recreational activities of visitors and their expectations of high scenic quality.

Visibility and Viewer Exposure - Visibility and exposure to the project site are high. Views to the plant are unimpeded, duration of views extended, and number of viewers very high.

Overall visual sensitivity of this KOP is therefore High.

KOP 7 - Bike Path West of ESGS

VISUAL RESOURCES Figure 4A depicts the view toward the project site from Dockweiler Beach State Park from near foreground distance (approximately 500 feet) looking east. This viewpoint is representative of beach visitors in the immediate foreground distances of the ESGS, and particularly, of thousands of walkers, bicyclists, and joggers who use this portion of Dockweiler Beach in transit from the north and south each year. The photograph is taken from the nearby rock groin extending into the Bay, and while it provides a good overview of the location, most viewers in the area actually experience the power plant from the bike path directly adjoining the western

plant boundary, along the fence-line seen in this photograph (see **VISUAL RESOURCES Figure 5**).

Views within this foreground zone surrounding the ESGS are obviously strongly dominated by the existing power plants. Various other features in the visual foreground include the narrow strip of beach; extensive rock revetment at the former SCE tank farm site immediately north of Manhattan Beach State Park; a portion of the ESGS site perimeter enclosed by cyclone fence, affording open views into the site; a 10 foot tall, 350 foot long concrete wall abutting the bike path; and a sizable lawn and landscaped area (approximately 450 feet long) adjoining the bike path west of existing Units 1 and 2. A rock groin extends approximately 500 feet into the Bay at the northern boundary of the ESGS property. The beach in this area was substantially eroded during large storms in 1977 and remains very narrow. The coastal strip thus serves primarily as lateral access between Manhattan and Dockweiler Beaches.

The contrasting viewing conditions of users of the bike path have been broken down for convenience into three distinct image types relevant to determination of potential impacts: the industrial image type of the ESGS site itself; the area of coastal open space and Bay views; and the landscaped area west of existing Units 1 and 2 adjacent to the bike path. Each of these image types has different corresponding sensitivity to impact.

Existing ESGS as Viewed from Bike Path

Visual Quality – Views toward the plant are completely dominated by the existing power plants, whose visually chaotic, highly industrial character is of low visual quality.

Viewer Concern – The relevant viewers in this area are users of the path and beach. Their sensitivity is high as is true elsewhere along the State beaches.

Visibility and Viewer Exposure – Visibility and viewer exposure to the plant are unimpeded and high. View duration at this distance is normally transitory – few visitors remain in this portion of the beach but experience it in transit from one part of the beach to another. Typical duration of exposure within this foreground viewing zone can therefore range from 5 to 20 minutes at a time. Nevertheless the numbers of visitors is very high, and viewing distance very low. Viewer exposure is thus high overall.

Overall, visual sensitivity of views to the existing ESGS is thus Low to Moderate.

Beach

Visual Quality – Visual quality of the beach and Bay views is high.

Viewer Concern – Viewer concern is high.

Visibility and Viewer Exposure – Visibility and viewer exposure are unimpeded and high.

Overall visual sensitivity in this portion of the view is thus High.

ESGS Units 1 and 2 Landscaped Area Viewed from Bike Path

Visual Quality – Despite the backdrop of Units 1 and 2, the landscaped area is seen in the immediate foreground of path users, lowering incompatible contrast of the power plant and representing a substantial (450 feet) area of moderate, rather than low, visual quality.

Viewer Concern – High

Visibility and Viewer Exposure - High

Overall impact sensitivity in this portion of the view is thus Moderate to High.

KOP 2 - Manhattan Beach State Park

VISUAL RESOURCES Figure 6A depicts the view toward the project site from Manhattan Beach State Park at approximately 1/2 mile distance. This view is representative of the hundreds of thousands of annual visitors to Manhattan Beach, at a point nearest the project site.

Visual Quality – Visual quality from the area of this KOP is high due to panoramic Bay views in three directions. The ESGS Units 1 and 2 power block is hidden behind Units 3 and 4, revealing only the visually subordinate exhaust stacks. The ESGS facilities as a whole are sufficiently distant to appear visually subordinate to the tank farm located in the foreground. These industrial features, though tending to lower visual quality, occupy a relatively small sector of the view, and draw less attention than views of the Bay and distant mountains, which exert strong visual attraction westward.

Viewer Concern – Viewer concern is high due to recreational viewer activity.

Visibility and Viewer Exposure – Visibility of the proposed ESPR site from this KOP is low due to the intervening Units 1 and 2, which largely screen it. Overall exposure is thus moderate, despite the very high numbers of viewers.

Overall visual sensitivity is thus Moderate to High.

KOP 4 - Manhattan Beach Pier

VISUAL RESOURCES Figure 7A depicts the view from Manhattan Beach Pier at far middleground (approximately 2-1/2 miles) distance to the south.

Visual Quality – Visual quality is high as at other beach locations due to scenic Bay views.

Viewer Concern – High, as elsewhere at beaches.

Visibility and Viewer Exposure – Visibility and exposure were considered low due to distance. Visual dominance of the ESGS is very subordinate at this distance.

Overall visual sensitivity is thus Low to Moderate.

KOP 8 - Vista del Mar

VISUAL RESOURCES Figure 8A depicts the view toward the project from Vista del Mar at foreground distance (1/2 mile or less), southbound. For motorists on Vista del

Mar, views of the existing ESGS Units 3 and 4 become highly dominant from a distance of roughly ¼ mile, although when viewers are at their nearest proximity to the plant (approximately 500 feet or less), it tends to fall outside of the motorist's normal cone of vision (power block is visible only at nearly perpendicular viewing angles), due to a left turning curve in the roadway in this segment.

Visual Quality – Within the foreground radius represented by this KOP, quality of views for southbound motorists is moderate. On one hand, intermittent views to the Bay may still be seen, and extensive landscaping of the Chevron site contributes to a moderately high scenic quality. On the other, the existing views of the plant itself, including power blocks, stacks, and appurtenant lattice transmission towers and lines at the roadside, as well as visible portions of the Chevron marine terminal to the west, are of low quality. Thus, overall quality was considered to be moderate.

Viewer Concern – Viewer concern was considered moderate to high. Very high numbers of viewers consist of a combination of tourists and recreationists with high scenic expectations, and commuters, workers and others who would be expected to have lower levels of scenic expectation and concern.

Visibility and Viewer Exposure – Overall viewer exposure was considered moderate to high. Visibility of the existing ESGS is high, due to the great height and prominence of the existing power blocks and stacks above the roadway. The ESGS power plants are the only structures within the 6-mile-long viewshed to skyline (intrude into the horizon of) views of the Bay from Vista del Mar. Existing landscape screening in this portion of roadway reduces exposure to the plant, but at 8 feet to 10 feet in height, has little effect in screening the tall plant features. Very high numbers of viewers, almost exclusively motorists, see the plant at very close distances, but the duration of exposure within the ¼- to ½-mile foreground radius (from vicinity of Grand Avenue in El Segundo, and 43th Street in Manhattan Beach) within which strong impacts could be expected is relatively transitory and brief, usually between 20 and 40 seconds at 45 mph.

Overall visual sensitivity is thus Moderate to High.

KOP 10 - Vista del Mar

From middle-ground distances (approximately ½-mile to 3 miles), a combination of moderate viewer concern and low viewer exposure due to distance contributes to an overall low level of visual sensitivity, despite high visual quality of the area.

Unit 3 - El Porto - Coastal Residential

KOP 9 – 45th Street, Manhattan Beach

VISUAL RESOURCES Figure 9 depicts the view from residences on 45th Street, Manhattan Beach (El Porto) toward the tank farm. Potential sensitive receptors within this portion of the viewshed include residents of approximately 166 homes in the City of Manhattan Beach along 45th Street (views from homes further south are largely blocked by intervening structures (ESPR 2000p). While views of the ESGS from the vicinity of 45th Street are largely screened by the existing storage tanks, and proposed Units 5, 6 and 7 would be screened to a large extent by the nearer existing Units 1 and 2,

residents of 45th Street would have very prominent views of laydown and construction activities at the existing tank farm site.

Visual Quality – Bay views are generally present but limited and narrow, and views tend to be dominated by existing residential development, perimeter landscaping, berm, and tank farm, resulting in moderate to high visual quality.

Viewer Concern – Viewer concern of residences is generally considered high.

Visibility and Viewer Exposure – Visibility and exposure to the ESPR project site would be low, but to the tank farm laydown site, very high.

Overall visual sensitivity is thus considered High.

KOP 3 - Vista del Mar.

VISUAL RESOURCES Figure 10A depicts the view toward the project site from Vista del Mar from Manhattan Beach looking north at foreground distance (approximately ½ mile). This KOP is representative of views of the ESGS by northbound motorists on Vista del Mar at distances of about 1/2-mile or less. It is also representative of views from some residences lining Vista del Mar. Within the City of Manhattan Beach, views of the power plant are visually subordinate to co-dominant, framed by low-rise residential development on each side. Entering the City of El Segundo at 45th Street at a distance of approximately 1/3-mile, views of the plant become dominant against the backdrop of the Bay horizon.

Visual Quality – Visual quality from this viewing area is generally moderate, typified by medium density residential structures with little or no landscaping and limited scenic views, but also including some views of the Bay and Santa Monica Mountains in the vicinity of 45th Street.

Viewer Concern – Viewer concern is considered moderate to high, due to the combination of recreationists, tourists, and residents with higher viewer concern, and commuters and others with lower levels of viewer concern.

Visibility and Viewer Exposure – Visibility and exposure to the plant is moderate to high. Near-distance views to the existing plant, strongly sky-lined against a background of Bay and mountains at the horizon, are generally unimpeded.

Overall visual sensitivity is thus considered Moderate to High.

IMPACTS

As described previously under Visual Analysis Methodology, visual impacts are assessed as a function of Overall Visual Sensitivity (viewing attributes) and Overall Visual Change (anticipated degree of visual change as a result of the project).

In this particular case, visual change - the anticipated change in visual character and quality as a result of the proposed project - was assessed in relation to the existing,

developed site, currently occupied by Units 1 and 2, which represent the assessment baseline. Thus, the increment of change in overall impact (contrast, dominance and view intrusion) between the existing ESGS and the proposed ESPR project is the basis for determining the level of project impact and resulting impact significance.

Ratings of existing and proposed project contrast, dominance, and visual change were made on the basis of field observation, photo documentation, and study of applicant-prepared visual simulations and other project information. It is important to note that, particularly due to the panoramic format used in the visual simulations, evaluation of simulations should utilize full-sized (approximately 11" image height) prints viewed at a normal reading distance of roughly one foot in order to approximate the field of view and level of contrast and dominance seen in the actual location.

KOP numbers from the AFC have been retained. However, the order in which they are discussed has been changed to accord with the structure of this analysis.

VISUAL PROJECT DESCRIPTION

Power Plant

VISUAL RESOURCES Figures 11 and 12 depict architectural elevation and isometric views of the proposed power plant. The existing ESGS Units 3 and 4 have a top-of-power block elevation of 156 feet and a top-of-exhaust stack height of 215 feet. The existing Units 1 and 2 to be replaced have a top-of-power block height of 157 feet, and a top of stack height of 224 feet. The proposed units would have a top-of-HRSG elevation of 125 feet, slightly shorter than the existing power blocks, and a top-of-stack elevation of 215 feet, slightly shorter than the existing stacks. The proposed stacks would be slightly broader than existing stacks. The HRSG and exhaust stack structures of Units 5 and 7 would be spatially separated by about 160 feet. Individually, they would be smaller than the existing Units 1 and 2 power block; taken together, they would be of roughly similar scale to the existing plant.

Unit 6 and related structures (the steam turbine generator and related components) are located between the taller, more dominant Units 5 and 7, and would be approximately 40 feet in height.

A 10-foot-tall, approximately 655-foot-long seawall is proposed west of the proposed Units 5, 6 and 7 immediately on the eastern side of the existing bike path. An additional wall west of the existing retention pond south of Units 3 and 4 has also been proposed.

Since the publication of the Staff Assessment (SA) in June, 2001, numerous workshops have been held to resolve visual/aesthetic issues. In response to Energy Commission staff concerns and proposed Conditions of Certification presented in the SA, the Coastal Commission recommendations in March, 2002, and subsequent comments expressing concerns from Intervenors including the Cities of El Segundo and Manhattan Beach, and Murphy and Perkins, the applicant has presented various new proposals for mitigation and enhancement of the project. These were summarized most recently in the applicant's Visual Enhancement Proposals, dated May 14, 2002 (ESPR 2002v) and

subsequent Project Description Amendment, dated June 17, 2002, which responded to questions raised at a workshop on May 22, 2002 (ESPR 2002aa).

Polyethylene Banner Screening System

In the Visual Enhancement Proposals, the applicant proposed a system of extruded, semi-transparent open-weave polyethylene banners to be mounted in horizontal bands on the HRSG superstructures in order to partially conceal the extensive piping and mechanical equipment anticipated on the outside of the HRSGs (see **VISUAL RESOURCES Figure 13**, KOP 7 Architectural Treatment Option No. 4). The fabric banners are described as largely transparent to the wind. The banners would be mounted on a moveable tracked roller system stretched between channels on girts mounted horizontally on the HRSG superstructure, allowing the banners to be drawn back for maintenance of the HRSGs (ESPR 2002cc).

Raised 45th Street Berm and Updated Landscape Concept Plan

In response to concerns of Intervenor Murphy and Perkins, the applicant proposed a large landscaped earthen berm along the southern, 45th Street boundary of the ESPR site. The top of the berm would be approximately 7 feet above the existing 45th Street grade, which is sloped, with a south-facing side slope of approximately 22 feet in width, and an overall width of 70 feet. The plan of the proposed berm is depicted in Appendix B of the Visual Enhancement Proposals and reproduced here in **VISUAL RESOURCES Figure 14** (ESPR 2002v). The north-facing slope of the berm would be retained by a 245-long retaining wall, running east to west. This wall would not be generally visible from off-site locations. The berm would be landscaped with trees and shrubs with the potential to substantially increase screening of views into the site from 45th Street residences, while preserving Bay view corridors from upper floor residences, as depicted in simulated views (**VISUAL RESOURCES Figure 15**, 4420 The Strand, Upper Level Final View) (ESPR 2002v).

The updated Landscape Concept Plan (dated April 23, 2002) includes a landscaped setback area of approximately 475 feet by 25 feet in the northwestern corner of the site adjacent to proposed Units 5, 6, and 7, with park benches and trees (see **VISUAL RESOURCES Figure 16A and B**). The seawall is described as undulating, to add visual interest to passersby on the beach trail, and to accommodate evergreen tree plantings. A 1.2 acre landscaped area is also depicted in the southwestern corner of the site, including 23 trees lining the frontage of the existing tank farm area. Tree and shrub plantings are shown along the Vista del Mar frontage, with the intent of providing interest, complementing landscaping of the Chevron berm on the east side of the road, but preserving any existing Bay views that may exist.

Finally, the revised Landscape Concept Plan (dated April 23, 2002) depicts parking striping, and eight associated trees adjacent to the proposed Administration Building (ESPR 2002v).

Construction Staging Area

The abandoned SCE tank farm site adjoining the ESGS to the south would be modified and used as the construction staging and laydown area as described in the applicant's proposed Tank Farm Plan (ESPR 2000x, Data Response 134b). During project

construction, or a period of up to 3-1/2 years, the existing abandoned tanks would be converted into enclosed domes, which would contain and conceal most material equipment and storage. Toward the end of the construction period, these tank/domes would be removed, the existing rock revetment east of the existing bike path would be removed, and perimeter landscaping would be installed.

Linear Facilities

No new off-site transmission lines are proposed in connection with the ESPR project. New single-pole generator lead towers would be constructed on-site east of proposed Unit 6.

A new 8-inch diameter underground pipeline would be constructed to carry reclaimed water from a tie-in point near the intersection of Richmond Street and West El Segundo Boulevard. The pipeline would run west along West El Segundo Boulevard, north on Richmond Street, west on West Grand Avenue, then south on Vista del Mar to the ESPR site, for a total length of approximately 1.75 miles.

VISUAL IMPACT ASSESSMENT

Operation Impacts

In discussions of simulations or respective KOPs, readers should note that representations are of the applicant's original, unmitigated project (that is, the proposed project without banners, landscaped berm, and other measures added to the project subsequent to publication of the Staff Assessment of June, 2001) except where identified otherwise. These recent visual measures have been added to achieve LORS conformance rather than mitigation of significant impacts, and are thus discussed in detail under Conformance with Applicable LORS, below.

The following discussions apply to potential impacts of the project structures, lighting and visible vapor plumes.

Middleground KOPs (KOPs 4 and 10)

Impact severity or anticipated degree of visual change due to introduction of proposed project structures from middle-ground viewpoints (over 1/2 mile distance) were considered to be weak to negligible due to low levels of contrast with existing conditions, low levels of visual dominance, and negligible view blockage effects. Combined with low to moderate levels of overall visual sensitivity due mainly to distance, and in particular, because significant impacts in this distance zone are not anticipated as a result of project vapor plumes, as discussed below, significant impacts are not anticipated to KOPs in this category. Thus, further discussion of impacts to these middle-ground KOPs is not considered necessary and the following analysis focuses upon potential impacts within the foreground distance zone.

Night Lighting Impacts

The CEQA Guidelines identify "new sources of substantial light or glare which would adversely affect day or nighttime views" as a potentially significant adverse impact.

Due to the prominence of the proposed Units 5 and 7 HRSG structures above the level of Vista del Mar, unmitigated night lighting has the potential to have a significant adverse impact on motorists from KOPs 3 (foreground views from Vista del Mar in Manhattan Beach) and 8 (foreground views from Vista del Mar in El Segundo). Unmitigated night lighting would also potentially adversely impact visitors at Dockweiler Beach at night.

In addition, the removal of existing storage tanks after completion of construction would expose views of night lighting of Units 3 and 4 and related ESGs ground-level lighting to the view of residents on 45th Street. Without mitigation this could also represent a significant adverse impact. Impacts to residents in this area due to lighting at the proposed units are not anticipated because of its obscuration by the intervening existing Units 3 and 4.

With recommended Conditions of Certification **VIS-6** and **VIS-7**, these impacts would be reduced to less than significant levels.

Visible Vapor Plumes

Staff conducted computer modeling of predicted visible vapor plumes using the CSVP computer model.¹ The results are depicted in VISUAL RESOURCES Tables 1 and 2, below.

VISUAL RESOURCES Table 1
Staff Predicted Worst-Case HRSG Steam Plume Seasonal Frequency
Full Load w/o Duct Burner, w/Power Augmentation
1990-1995 LAX Meteorological Data¹

Year		Spring	Summer	Fall	Winter	Annual
1990	Hours	15	0	5	72	92
	Frequency	1.28%	0.00%	0.55%	8.14%	2.21%
1991	Hours	34	0	2	41	77
	Frequency	2.88%	0.00%	0.24%	4.81%	1.94%
1992	Hours	2	0	4	38	44
	Frequency	0.17%	0.00%	0.45%	4.45%	1.09%
1993	Hours	11	1	9	43	64
	Frequency	0.94%	0.09%	1.00%	5.24%	1.58%
1994	Hours	22	0	14	24	60
	Frequency	1.99%	0.00%	1.52%	2.66%	1.46%
1995	Hours	37	2	5	37	81
	Frequency	3.36%	0.18%	0.64%	4.93%	2.18%
Average	Hours	20	1	7	43	70
	Frequency	1.75%	0.04%	0.74%	5.04%	1.74%

¹ – Frequencies based on the seasonal daylight no fog no rain hours.

These results show that even when modeling the most conservative operating condition the plume occurrence frequency for daylight no fog no rain hours is predicted to be less than 10% seasonally.

¹ Vapor plume modeling prepared by William Walters.

Plume magnitudes were predicted to be as follows:

VISUAL RESOURCES Table 2
 Staff Predicted HRSG Steam Plume Dimensions (meters)
 Daylight No Fog No Rain Hours

Full Load w/Duct Burner and Power Augmentation	Length	Height	Width
Maximum	240	172	31
Average	223	153	29
Full Load w/o Duct Burner and Power Augmentation			
Maximum	*	*	*
Average	*	*	*
50% Load w/o Duct Burner and Power Augmentation			
Maximum	131	111	18
Average	121	103	16
Full Load w/o Duct Burner, w/Power Augmentation			
Maximum	465	659	57
Average	166	150	25

* - model results do not show plumes forming during daylight no fog no rain hours for this exhaust condition.

The applicant did not provide Unit 1 and 2 exhaust parameters in response to staff's data request. However, the Unit 3 and 4 Stack Exhaust parameters that were provided by the applicant are considered to be similar to the Unit 1 and 2 Stack Exhaust Parameters, and are being used as a surrogate for this analysis. Using the LAX 1990 to 1995 met data the following plume frequencies were determined for Units 3 and 4:

VISUAL RESOURCES Table 3
 Staff Predicted Unit 3 and 4 Steam Plume Frequency Summary
 1990-1995 LAX Meteorological Data¹

	Full Load w/Duct Burner and Power Augmentation	
	Hours	Frequency
Day	786	2.95%
Day nf/nr	194	0.81%
Night	4107	15.84%
Total	4893	9.31%

¹ - Summary of all six years plume frequencies (52,577 total hours).
 nf/nr – no fog no rain hours

The CSVP predicted plume size characteristics for daylight no fog no rain hours are as follows:

VISUAL RESOURCES Table 4
 Staff Predicted Unit 3 and 4 Stack Steam Plume Dimensions (meters)
 Daylight No Fog No Rain Hours

	Length	Height	Width
Maximum	433	609	57
Average	169	156	25

The modeling results show that the plumes from the existing Unit 3 and 4 stacks are significantly more frequent and somewhat larger than the predicted plumes from the ESPR project Unit 5 and 7 HRSG stacks. When operating with power augmentation on and the duct burners off, the Unit 5 and 7 plume frequencies are predicted to be higher than the Unit 3 and 4 frequencies. However, the applicant has stated that this operating case is not expected to occur frequently. Therefore, as noted above, under the operating conditions that would occur the majority of the time, the plume frequencies for Units 5 and 7 are forecast to be below those forecast for Units 3 and 4. Therefore, because the plume frequencies for Units 1 and 2 are considered to be similar to those for Units 3 and 4, the replacement of Units 1 and 2 with new Units 5 and 7 would serve to reduce the existing visible plume impacts from the plant.

Overall, the staff modeling indicates that frequencies of plumes with significant magnitude would not approach the 10% seasonal daytime no-rain / no-fog criterion used for establishing potentially significant visual plume impacts. In terms of both the existing baseline condition, and absolute criteria established by staff for plume impact evaluation, the ESPR project would thus have less than significant plume impacts.

Landscape Unit 1 – Coastal Industrial

No KOPs were identified within this landscape type, because viewers in these locations were presumed to have low viewer concern due to the industrial, work-related nature of their activities.

Landscape Unit 2 – Coastal Open Space

KOP 1 – Dockweiler Beach

VISUAL RESOURCES Figures 3A and 3B represent views from Dockweiler Beach State Park from approximately ½-mile, looking south.

Existing ESGS

Visual Contrast - From this viewpoint, representing the farther limit of the foreground distance zone at Dockweiler Beach, form, line and texture contrast of the existing ESGS against the horizontal lines of the bluffs, beach, Bay, and background mountain ridges is high, due to its unique blocky, vertical forms and visually chaotic industrial character. Color contrast against the sky and beach are moderate to high, and overall, contrast is high.

Visual Dominance – The existing ESGS is visually dominant from this KOP, strongly drawing attention by prominent sky-lining against the visual setting of level beach and open sky.

View Blockage – The existing ESGS intrudes conspicuously into the otherwise relatively intact view of sky and horizon. At the far limit of the foreground distance zone (about ½ mile), the portion of the overall field of view occupied by the ESGS is relatively small, resulting in a moderate level of scenic view blockage.

Overall Impact – Overall, the existing impact is strong.

Proposed ESPR

Visual Contrast - As depicted in **VISUAL RESOURCES Figure 3B**, the high degree of existing contrast between Units 1 and 2 and their setting would continue under the proposed project due to a comparable level of vertical line and form contrast between the proposed new units and the strong horizontal lines and open sky of the existing setting. The resulting change in levels of contrast between the existing and proposed conditions would, however, be weak.

Visual Dominance - The high degree of existing dominance of the ESGS would continue under the proposed project, increasing somewhat due to more prominent sky-lining against the horizon and open sky. The resulting change in levels of dominance would nevertheless be negligible to weak.

View Blockage – The degree of view blockage of horizon and sky would increase somewhat from the existing condition under the proposed project due to the slightly increased prominence of the new structures. However, the change in levels of view blockage would be negligible.

Overall Impact - The level of impact severity under the proposed ESPR project would be strong. The level of overall visual *change* from this KOP would be weak.

Impact Significance – The sensitivity to impact of this KOP is high. However, since the level of overall visual change between the existing and proposed conditions would be weak, anticipated impacts would be less than significant.

KOP 7 – Bike Path West of ESGS

VISUAL RESOURCES Figures 4A and 4B represent views in the immediate vicinity of the ESGS, as seen from the bike path and beach directly adjacent to the power plant, but seen in this photograph from the existing rock groin facing east. This viewpoint is representative of beach visitors in the immediate foreground of the ESGS, and particularly, of the thousands of pedestrians, bicyclists, and joggers who use this portion of beach in transit from Dockweiler Beach to the north and Manhattan Beach to the south. Although the photograph, taken from the end of the nearby rock groin extending into the Bay, provides a good overview of this use area, nearly all viewers actually experience the power plant from the bike path adjoining the western plant boundary, facing either south, west, or north, due to severe beach erosion from storms in 1977, which left only a very narrow strip of beach remaining. The area's principal use is as an access joining Dockweiler and Manhattan Beaches.

For purposes of convenience this area was described in the Setting discussion as three distinct image types: the ESGS as a whole; the beach itself and a landscaped area west of Units 1 and 2. Each of these has different characteristics, affecting the potential for impacts, as follows:

ESGS

Visual Contrast - As seen in **VISUAL RESOURCES Figure 4A**, the existing contrast of the ESGS with the surrounding, highly scenic landscape is extremely strong. The two power blocks introduce strongly contrasting blocky, vertical forms against an otherwise horizontal landscape of coastal bluffs to the east, and level beaches and Bay in other directions. Texture contrast is also very strong, characterized by visually chaotic scaffolding, piping, machinery, and metallic ductwork, against a backdrop of vegetation, sky, beach and sea.

As depicted in **VISUAL RESOURCES Figure 4B**, the very strong degree of contrast from the main power plant structures would continue under the proposed ESPR project, or decrease slightly, depending upon the exact viewpoint, due to the lower height of the HRSGs compared to the Units 1 and 2 power block, and the spatial separation of Units 5 and 7.

The overall *change* in contrast to the ESGS as a result of the ESPR project would be negligible.

Visual Dominance – Existing strong dominance of Units 1 and 2 would remain strong or decrease slightly. A slight decrease in the bulk of the individual HRSGs compared to the combined Units 1 and 2 power block would be off-set by an increase in the developed site area of Units 5, 6, and 7 and thus, an increase in the duration of exposure of viewers. The overall change in dominance in the ESGS would thus be negligible to weak.

View Blockage - Substantial view blockage of sky as seen from the bike path occurs due to existing Units 1 and 2, and this would remain true under the proposed ESPR project. Despite the spatial separation of the two new HRSGs, the change in the overall amount of view blockage would be negligible to weak.

Overall Impact - Overall change in levels of impact would be negligible to weak.

Impact Significance – Because overall visual sensitivity of views of the ESGS is low to moderate, impacts would be insignificant.

Beach

The proposed ESPR project would not extend outside the existing ESGS site. Therefore, views to the beach and Bay would not be affected, and change to contrast, dominance, and view blockage in this image type would be negligible. Scenic views westward would be unaffected and no overall change in impact would occur.

Landscaped Area West of ESGS Units 1 and 2

Visual Contrast - An approximately 450 foot long landscaped area currently adjoins the bike path west of existing Units 1 and 2, providing a modest degree of screening and a softening of the otherwise completely industrial, mechanical character of views in this portion of the path. Since this area is viewed in the immediate foreground of the path, it has a mitigating effect on contrast and impact to viewers on the path.

Due to proposed construction of an approximately 10 foot tall seawall in the area of the existing landscaping, the landscaping would be removed, resulting in a moderate to strong contrast with the previous landscaped setting, and a resulting decline in visual quality of this portion of the setting. It would also, however, screen views of the ESPR in this section of the path, resulting in a decline in contrast of the ESPR project itself.

Visual Dominance – The proposed seawall would introduce a potentially monotonous vertical feature that would visually dominate portions of the view in the direction of the power plant as seen from the path. However, it would also serve to partially screen views of the visually distracting and chaotic HRSGs and Unit 6 steam turbine generator (STG) structures, resulting in a moderate reduction in contrast and dominance of the ESPR in comparison to the existing Units 1 and 2. A wall of this height and location has the effect of reducing dominance of the power plant increasingly as the viewer draws nearer to the plant. North or south of the wall itself, it would have minimal screening effect.

View Blockage – The proposed seawall would result in moderate to strong blockage of views of the ESPR in the immediate vicinity of Units 5, 6 and 7, a beneficial effect. North or south of the wall itself, this screening effect would be minimal. Any increase in blockage of sky compared to the ESPR power plant itself would be negligible.

Overall Change and Impact Significance – The proposed seawall would have the effect of reducing the level of incompatible contrast from power plant structures to a weak degree through screening as seen from a portion of the path in the immediate vicinity of the proposed units, a weakly beneficial change. An unmitigated seawall would have the potential to introduce a strong degree of adverse visual change through replacement of 450 feet of existing landscaping with a 655-foot monotonous concrete wall. Concern was also expressed by the City of El Segundo for the wall's ability to attract graffiti. Overall, these changes would represent a moderately adverse visual change. With the moderate to high visual sensitivity of this view, impacts would be adverse but less than significant.

With staff recommended Conditions of Certification **VIS-2 and VIS-3**, which incorporate landscaping and seawall requirements consistent with the applicant's most recent Conceptual Landscape Plan (ESPR 2002v), the adverse effects of landscape removal and wall construction would be minimized through landscape and wall design enhancements, and overall impacts would be beneficial.

Tank Farm

A portion of the bike path abuts the existing SCE tank farm. Potential impacts to the bike path due to the use and mitigation of the tank farm would be essentially as already discussed under KOP 2. With recommended Condition of Certification **VIS-2**, overall impacts in this section of the path would be beneficial.

KOP 2 – Manhattan Beach

VISUAL RESOURCES Figures 6A and 6B represent views from Manhattan Beach State Park at a distance of approximately 1/2-mile from Units 1 and 2.

Existing ESGS Units 1 and 2

Visual contrast, dominance, and view blockage of existing Units 1 and 2 from this viewpoint are weak due to screening by the intervening Units 3 and 4. Overall impact of the existing ESGS as a whole is moderate to strong, although it remains visually subordinate to the existing tank farm.

Form, line, color and texture contrast of the existing tank farm is strong. The storage tanks contrast strongly in form and color against the sky and surrounding landscaping, and are co-dominant with other development to the east. They cause minor blockage of views of the sky. Due to the strong visual attraction of the Bay, they are considered subordinate within the overall view. Overall impact of the tanks from this KOP is strong.

Proposed ESPR

Visual Contrast - Contrast in form, line, color and texture of the proposed power plants from this viewpoint would be weak to negligible, due to screening by intervening, existing Units 3 and 4. The ESPR stacks would be slightly shorter, but broader than those of existing Units 1 and 2. This increased contrast would be generally unnoticed. Overall change in contrast from the existing ESGS would thus be negligible.

Ultimate removal of oil storage tanks at the tank farm site after construction would eliminate the existing contrast in character between these prominent industrial features in the immediate foreground and the existing beach, sky, and landscaping. The long-term impact of this change (after completion of construction and tank removal as proposed) would thus represent a strong decrease in contrast from the existing condition.

Visual Dominance – Similarly, the change in visual dominance due to the proposed Units 5, 6 and 7 compared to existing Units 1 and 2 from this viewpoint would be negligible. Visual dominance of the storage tanks would be eliminated.

View Blockage – The proposed project stacks would continue to block a small portion of the view of sky. The change in degree of blockage between the existing and proposed plants from this KOP would be negligible. The change in blockage of sky views by the tanks would be eliminated.

Overall Impact – Overall impact from this KOP would thus be reduced from moderate or strong levels, to weak levels.

Impact Significance – Anticipated visual impacts from this KOP would thus be beneficial. With removal of revetment as proposed by the applicant in the proposed Tank Farm Plan, and installation of perimeter landscaping as depicted in the conceptual landscape plan (ESPR 2000rr), and as described under Condition of Certification **VIS-2**, overall impacts from this viewpoint would be beneficial.

KOP 8 – Vista del Mar

VISUAL RESOURCES Figures 8A and 8B represent views from the project visual foreground as seen by southbound motorists on Vista del Mar.

Existing ESGS

Visual Contrast - The Unit 2 coastal open space landscape is characterized by panoramic views of broad, horizontal lines formed by the marine horizon, mountain ridges enclosing the Bay to the north and south, and beaches which can be seen extending to background distances from elevated viewpoints such as Vista del Mar. Against this background, the existing ESGS, characterized by strongly vertical, blocky, often sky-lined forms of the power blocks and exhaust stacks and, at close distances, by completely unscreened, visually intricate and chaotic views of piping and ducts, machinery, scaffolding and other metallic features, presents very high levels of contrast in form, line, color, and texture.

Visual Dominance - The existing power blocks exhibit strong visual dominance within the visual foreground as well, looming approximately 70 to 134 feet above the adjacent roadway, although existing Units 1 and 2, due to their position in relation to Vista del Mar, tend to fall outside a motorist's normal cone of vision at the point of greatest prominence (roughly 500 feet distance or less).

View Blockage - Blockage of motorists' views to the Bay is total within the immediate foreground of the plant.

Overall Impact – Overall, the existing impact of the ESGS from this KOP is strong to very strong.

Proposed ESPR

Visual Contrast - As depicted in **VISUAL RESOURCES Figure 8B**, contrast in form, line, color, and texture would be similar to those of the existing facility. That is, anticipated levels of contrast of the ESPR project would remain very high. The level of change between the existing and proposed projects would thus be weak.

Visual Dominance - From KOP 8, the proposed Units 5 and 7, in comparison to the existing ESGS, would result in an overall increase in visual dominance from strong to very strong levels. This would result from an increased area of project surface exposed to view, due partly to the rotated orientation of the HRSG structures, which exposes their long dimension to full view of on-coming motorists; to slightly reduced but comparable overall height and increased diameter; to the increased spatial separation of Units 5 and 7, causing them to occupy a wider portion of the field of view than the existing units and to occupy those views for a slightly longer duration of time; and most importantly, due to their closer proximity to the roadway in comparison to the existing Units 1 and 2, causing a larger proportion of both units to fall within a motorist's normal field of view. They would thus appear more dominant from a greater distance than the existing power plant. This increased dominance would be experienced primarily by motorists for relatively brief durations of time within the visual near-foreground of the plant. The change in dominance would be moderate.

View Blockage - Due to the spatial separation of the two tall HRSG and stack structures of the proposed units, increased views to the Bay could be visible between the two units as motorists passed by, if existing landscaping in the area were also to be removed or made shorter. Blockage of high quality views could thus be reduced to a minor degree.

However, the nearly perpendicular angle of such views to motorists, and their extremely short duration (approximately 2 to 3 seconds at 45 miles per hour), would not, in staff's view, compensate for the increased exposure to extremely dominant, visually chaotic views of unscreened industrial machinery at very short distances.

Overall Impact – Overall, impact would be very strong. The anticipated change in level of impact between the existing and proposed projects would be weak to moderate.

Impact Significance – The moderate overall impact, taken with the moderate to high level of visual sensitivity in this location, would result in an adverse but less than significant impact from this KOP.

Landscape Unit 3 - El Porto Coastal Residential

KOP 9 – 45th Street, Manhattan Beach

VISUAL RESOURCES Figure 9 depicts the view toward the tank farm from residences on 45th Street in Manhattan Beach directly south of the existing tank farm proposed as the project staging and laydown area.

The primary impacts of concern from this KOP are construction-related and discussed later, under **CONSTRUCTION IMPACTS**.

However, removal of the existing tanks after construction, though visually beneficial in itself, would increase visibility of Units 3 and 4 from the vicinity of some residences. The resulting moderate adverse increase in visual contrast due to visibility of the tank farm grounds and the ESGS would be offset by a substantial decrease in blockage of Bay views. The overall change in impact would thus be negligible or slightly beneficial.

Under the applicant's proposed perimeter landscape plan, as further described in Condition of Certification **VIS-2**, tanks would be removed, landscape screening would be installed at the perimeter in order to soften views of the site without blocking views, and ultimate post-construction impacts from this KOP would be beneficial. Under the applicant's proposed Tank Farm Plan, tanks would be removed at the end of construction, resulting in enhanced Bay views and additional beneficial effects.

KOP 3 – Vista del Mar, Manhattan Beach

VISUAL RESOURCES Figures 10A and 10B represent views from Vista del Mar in Manhattan Beach, northbound, from approximately ½-mile distance from Units 1 and 2.

Existing ESGS

Existing contrast, dominance, view blockage and thus, overall impact of the existing ESGS in this distance zone are strong.

Proposed ESPR

Visual Contrast – Overall contrast of the ESGS with the proposed ESPR project would remain strong from these viewpoints. Overall change in contrast would generally be

weak. In the immediate vicinity of the proposed Units 5, 6 and 7, project contrast would increase to a moderate degree due to the increased prominence of the HRSGs as a result of their location nearer the roadway than the existing Units 1 and 2. However, the portion of the view so affected, directly adjacent to the power plant, would affect passing motorists only, who would experience this change for brief durations, and not more distant residents in Manhattan Beach.

Visual Dominance - Scale and spatial dominance of the proposed project would increase somewhat in comparison to the existing Units 1 and 2 but would remain subordinate to Units 3 and 4 for northbound motorists. Proposed Units 5 and 7 would have noticeably increased dominance in the portion of roadway adjacent to the new facilities, as discussed under KOP 8, above, but the duration of these views would be very brief.

View Blockage – Blockage of Bay views would be unchanged as a result of the ESPR project. Blockage of sky would increase slightly due to the more prominent location of the HRSGs, but overall change would be weak.

Overall Impact and Impact Significance – Overall impact from the ESPR would increase from strong to very strong due to an increase in visual dominance, a generally weak level of overall change. With the setting's moderate to high visual sensitivity, this weak degree of change in overall levels of impact would be somewhat adverse, but less than significant.

Construction Impacts

Construction Activities at Tank Farm Laydown Area from KOP 9

Construction activities proposed at the tank farm staging and laydown site are a primary concern of residents in Manhattan Beach. The period of construction could extend for up to 3-1/2 years, and result in significant adverse effects if unmitigated. Under the applicant's proposed Tank Farm Plan (ESPR, 2000x) the existing abandoned storage tanks would be converted into dome structures, which would visually shield and contain most construction activities and lighting to less than significant levels. The applicant has also proposed related construction measures, such as control of vehicle head light glare at night. With these measures, as described under recommended applicant's Tank Farm Plan, together with perimeter landscaping as described in applicant's conceptual landscape plan (ESPR, 2002v) and specified in recommended Conditions of Certification **VIS-2** and **VIS-9**, visual effects of construction from 45th Street would be reduced to less than significant levels.

Construction from KOPs 3 and 8 (Vista del Mar)

Although construction of upper portions of the proposed Units 5 and 7 would be visible from Vista del Mar, these activities would not be expected to be more visually adverse than the existing or proposed facilities themselves, which currently have and would continue to have strong to very strong levels of impact. Expected change to this level of impact due to construction activities would be weak and less than significant.

Construction from KOPs 2 and 7 (Manhattan Beach, Bike Path)

As described under KOP 9, principal visible construction activities from these locations would be those at the tank farm staging area. With implementation of the proposed Tank Farm Plan, visual impacts of construction would be minimal and less than significant.

Construction from KOP 1 (Dockweiler Beach)

Although construction activities would be visible from this location, these activities would not be expected to be more visually adverse than the existing or proposed facilities themselves, which currently have and would continue to have a visually chaotic character and strong to very strong levels of impact. Expected change to this level of impact due to construction activities would be noticeable but weak and less than significant.

Cumulative Impacts

No reasonably foreseeable future cumulative projects were identified. The only available parcel capable of future development in the vicinity is the former SCE tank farm site. Future development of that site is not currently anticipated.

Potential project contributions to cumulative visible vapor plume impacts when combined with existing plumes of Units 3 and 4 and the Scattergood Plant, are sufficiently infrequent that staff considered these to be *de minimis* and less than significant.

COMPLIANCE WITH APPLICABLE LORS

City of El Segundo

The City of El Segundo Coastal Zone Specific Plan/Local Coastal Program, adopted by the City in 1980 and certified by the Coastal Commission in 1982, Section VI.L. Visual Resources and Special Communities, states that the City General Plan contains policies which apply to industrial areas and which “are fully adequate to protect scenic and visual resources in the coastal zone.” Applicable policies of the General Plan include:

Policy LU5-2.1. New industrial developments shall provide landscaping in parking areas and around the buildings. This landscaping is to be permanently maintained.

The conceptual landscape plan submitted by the applicant on April 23, 2002 depicts enhanced perimeter landscape treatments on all four boundaries of the ESGS. With inclusion of this measure, as further described under recommended Condition of Certification **VIS-2**, the proposed project would comply with this policy. As described under recommended Condition of Certification **VIS-2**, the applicant would be required to maintain the proposed landscaping.

Policy LU5-2.2. All outdoor storage shall be properly screened by masonry walls and landscaping.

The applicant has proposed that temporary construction-related outdoor storage of materials and equipment would be screened by conversion of existing tanks on the

proposed tank farm laydown area into dome enclosures for the duration of construction activities.

A segment of the bike path southwest of the existing Units 3 and 4 is currently screened only by chain link fence, exposing open views into the ESGS site.

With applicant's proposed perimeter landscaping as specified under recommended Condition of Certification **VIS-2**, the project would be in conformance with the intent of this policy.

Objective LU5-3. Encourage the rehabilitation of existing substandard blighted industrial areas through the combined efforts of private and public sectors.

Policy LU5-3.1. Revitalize and upgrade industrial areas which contain aesthetic or functional deficiencies in such areas as landscaping, off-street parking, or loading areas.

The existing and proposed facilities, due to their heavy industrial character within the scenic coastal zone and within foreground views of the ocean as viewed from heavily traveled Vista del Mar, represent an industrial area of substandard, blighted appearance with aesthetic deficiencies in the areas of landscaping and general architectural treatment. These deficiencies would be addressed through implementation of the landscape plan as submitted by the applicant and called for in recommended Condition of Certification **VIS-2**, and would be addressed most fully with additional recommended Conditions of Certification **VIS-3**, **VIS-4** and **VIS-5**.

El Segundo Zoning Code Title 15, Chapter 2, General Provisions.

Section 15-2-14.

1. Vehicular Use Areas: All surface vehicular use areas (VUA) shall provide landscape areas including shade trees and permanent irrigation systems, to cover five percent of the VUA. Landscaping shall be distributed uniformly throughout the VUA, and shall be in addition to the required property perimeter and building perimeter landscaping. There shall be one tree for every 3,000 square feet of VUA. These trees shall be evenly distributed throughout the automobile parking area to provide shade and provided around the perimeter of truck loading/waiting areas to provide screening. Individual tree and planter areas shall not be less than three feet in width, excluding curbs.

2. Building Perimeter: In those instances where setbacks are provided, all buildings, including parking structures, shall have landscape areas and permanent irrigation systems around their perimeter. A minimum horizontal depth of five feet of landscape materials, excluding curbs, shall be provided around the buildings, except additions to buildings in the rear one-third of a lot, which do not abut residential property, where landscaping would not be visible from the public right of way need not provide building perimeter landscaping in the rear. A combination of soft and hard landscape materials may be installed, provided the use of such materials form a cohesive, attractive and functional design. (Ord.1257, 6-18-1996)

3. Property Perimeter: All required setback areas shall be fully landscaped including permanent irrigation systems. The landscaping shall incorporate the theme utilized for the public rights of way and one shade tree shall be provided for every 25 feet of street frontage.

At the visual issues workshop conducted at El Segundo on July 3, 2001, the City of El Segundo expressed concern over potential non-compliance of the proposed project with local zoning requirements for minimum landscaping of vehicular parking areas and building perimeters in the area of the existing 'Tank Farm,' to be utilized during and after construction as a staging area, and for parking. Therefore, all parties agreed that an additional Condition of Certification stipulating conformance with these portions of the City zoning ordinance be added to the Conditions of Certification. This measure has been incorporated into Condition of Certification **VIS-2**.

Subsequently, in a letter dated June 20, 2002, the City of El Segundo requested that a portion of proposed trees as described in the Landscape Concept Plan dated April 23, 2002 (ESPR 2002v) be relocated to the existing berms on the north and west side of the tank farm, in order to integrate the appearance of the existing berms with the proposed berm on 45th Street (COES 2002c). With this alteration in the proposed Landscape Plan, the City of El Segundo indicated that specific LORS conformance issues with respect to landscaping requirements would be addressed to the City's satisfaction. These requested changes by the City will thus be addressed during the required City review of the final Landscape Plan under Conditions of Certification **VIS-2** and **VIS-9**.

City of Manhattan Beach

The proposed ESPR project would take place entirely within the City of El Segundo, thus polices of the City of Manhattan Beach would not apply. However, the following policy and goal indicate the City's intent with regard to the potentially affected residential area south of the ESGS.

Land Use Policy 5.2. Require the separation or buffering of low-density residential areas from businesses that produce noise, odors, high traffic volumes, light or glare, and parking through the use of landscaping, setbacks, and other techniques.

LU Goal 7. Protect existing residential neighborhoods from the intrusion of inappropriate and incompatible uses.

As discussed previously, with implementation of the proposed Tank Farm Plan and recommended Conditions of Certification **VIS-2**, **VIS-7**, **VIS-8**, and **VIS-9**, the project would appear to staff to conform with the visual aspects of these policies.

Neighboring residents of Manhattan Beach have expressed considerable concern throughout the Staff Assessment process, however, and residents Murphy and Perkins were assigned Intervenor status in the proceedings. Particular concern was raised prior to publication of the SA with regard to potentially significant visual and noise impacts from project construction, which would occur for several years. These concerns were largely resolved by the parties through the applicant's proposed Tank Farm Plan.

Subsequent responses by the applicant to visual and other land use compatibility issues raised by residents in Manhattan Beach have been made primarily in the context of the need for visual enhancements to achieve compliance with the California Coastal Act, as described in detail below, and not in relation to local policies. These concerns of Manhattan Beach residents and the measures proposed by the applicant are thus described in detail below under discussion of Coastal Act conformance.

In addition, at the workshop of May 22 and in a letter to the Energy Commission responding to the Visual Enhancement Proposals dated June 20, 2002, the City of Manhattan Beach expressed concerns about the visual effects of the ultimate replacement of existing oil storage tanks with an asphalt surface (COMB 2002d). The City proposed leaving the area not used for parking unpaved, and hydroseeding and irrigating it when not in use for staging purposes. Again, this concern is raised under the Coastal Act requirements and not local policies.

California Coastal Act

Section 30251 of the Coastal Act states:

“Permitted development shall be sited and designed to protect views to and along the ocean and scenic coastal areas, to minimize the alteration of natural land forms, to be visually compatible with the character of surrounding areas, and, where feasible, to restore and enhance visual quality in visually degraded areas.” (Pub. Resources Code, § 30251)

The existing ESGS and proposed ESPR plants are not regarded by staff as visually compatible with their scenic, high use, high sensitivity coastal setting. While they do not represent the only industrial features in the viewshed, they are the only features between the City of Manhattan Beach and the northern boundary of LAX to substantially intrude upon views of Santa Monica Bay from Vista del Mar. Further, neither the existing ESGS nor an unmitigated ESPR would be of a comparable level of visual quality to other industrial development in the surrounding viewshed. For example, the adjoining Chevron refinery is substantially screened from views on Vista del Mar by tall, heavily landscaped berms; the Scattergood Power Plant is housed within an architectural enclosure that emulates the appearance of a building, lowering its potential visual impact; and the machinery and equipment of the Hyperion waste treatment facility are substantially screened by extensive exterior architectural housing which enhances the visual unity of the facility as seen from the road (see **VISUAL RESOURCES Figure 2**). In contrast, the existing ESGS does, and proposed ESPR would, expose views of visually chaotic piping and mechanical equipment to hundreds of thousands of viewers annually on adjoining Vista del Mar, and Manhattan and Dockweiler State Beaches (see **VISUAL RESOURCES Figures 4A and B and 8A and B**). Further, the redevelopment of the ESGS provides a rare opportunity to feasibly "restore and enhance visual quality in visually degraded areas" of the coastal zone. Therefore, in the SA, Energy Commission staff recommended Conditions of Certification **VIS-2, VIS-3, VIS-4, and VIS-5**, requiring perimeter landscaping, seawall design enhancement, architectural screening of mechanical equipment on the proposed power blocks, and structural painting, in order to achieve conformance with section 30251 of the Coastal Act.

In response to staff data requests 105 and 106, the applicant submitted artist renderings of the proposed project with pop-off architectural panels mounted on the HRSG superstructures, which staff found to be effective in screening the power plant mechanical equipment, and enhancing the overall appearance of the project (ESPR 2000mm, supplemental data responses 105 and 106). On this basis staff stated in the SA that adoption of recommended Conditions of Certification, including **VIS-4** (architectural screening) would achieve full compliance with the Coastal Act and other applicable LORS (see **VISUAL RESOURCES Figure 17**).

In a letter addressed to the Energy Commission dated May 21, 2001, the City of El Segundo stated that “the project would be significantly improved by the inclusion of (removable screening) panels in the design of the new units” (COES, 5/21/2001).

However, at workshops following publication of the SA, and in other correspondence with the Energy Commission, the applicant questioned the need for Condition of Certification **VIS-4** to achieve LORS conformance, and did not agree to adoption of the pop-off panel screening system previously depicted.

At a February 7, 2002 workshop, architectural screening of the power plants as called for under Condition **VIS-4** was discussed and endorsed by both the Cities of Manhattan Beach and El Segundo, and by local citizen groups who commented. Only one citizen questioned the need for such a measure at that workshop, acknowledging however that her viewpoint was not likely to be shared by most other observers.

Coastal Commission Decision

On March 6, 2002, the Coastal Commission met to hear the issue of the ESPR project’s conformance with the Coastal Act on specifically visual resource-related issues pursuant to its responsibilities under Section 30413(d) of the Coastal Act and Section 25523(b) of the Warren-Alquist Act. The Coastal Commission’s findings are summarized here briefly, and may be found in their entirety as **Appendix VR-2** (CCC 2002a).

In its decision the Coastal Commission determined that of four requirements of Section 30251 of the Coastal Act, relating to visual resources in the coastal zone, the proposed ESPR project would not conform with three: 1) that “permitted development shall be sited and designed to protect views to and along the ocean and scenic coastal areas;” 2) that ‘development shall minimize the alteration of natural land forms’; and 3) that development ‘shall be visually compatible with the character of the surrounding areas.’

The Coastal Commission further found that the proposed ESPR project is a coastal-dependent use, and therefore may nevertheless be found consistent with the Coastal Act if it mitigates adverse environmental effects ‘to the maximum extent feasible,’ as called for under section 30260 of the Coastal Act.

Regarding the fourth requirement of Section 30251, that ‘where feasible, (development shall) ... restore and enhance visual quality in visually degraded areas,’ the Coastal Commission observed that this requirement involves a three-part test: 1) is the area

‘visually degraded’; 2) if so, are there measures that would restore or enhance visual quality; and 3) if so, are those measures feasible? To summarize very briefly, regarding these three tests the Coastal Commission found the answers to all three to be ‘yes.’

The Coastal Commission findings generally concurred with the recommended conditions for mitigation and enhancement of visual resources presented in the SA, but are presented in the form of specific provisions in accordance with Section 25523(b) of the Warren-Alquist Act. The Coastal Commission however, expressed concern that determination of conformity with the Coastal Act normally requires that the effects of a proposed project, and measures necessary to mitigate those effects, be known *before* the impacts occur. In the SA, Energy Commission staff recommended that mitigation measures, including specific architectural screening design, be finalized *after* project certification and be implemented prior to project operation. The Coastal Commission therefore recommended that plans for such mitigation measures be submitted for review and approval as early in the process as possible. In its specific provisions, the Coastal Commission called for the completion of the visual mitigation plans before the start of construction, and to be made available for review and comment by the Coastal Commission Executive Director and review and approval by the Energy Commission.

In addition, the Coastal Commission recommended that the visual enhancement measures contained within the Staff Assessment’s recommended conditions be consolidated under a single ‘Facility Visual Enhancement Plan,’ including the various specific conditions and recommendations, in order to ‘allow a coordinated evaluation of the necessary visual mitigation measures’ and ‘provide an overall assessment of the facility’s visual effects.’ In its findings, the Coastal Commission therefore recommended that the conditions of certification included in the June 2001 SA be amended to add certain stated conditions in order to enhance the views of the facility from areas accessible to the public.

It should be noted that the specific provisions requested by the Coastal Commission, do not in themselves add any substantive new conditions to those already included in Energy Commission staff-recommended Conditions of Certification **VIS-2** through **VIS-5**, though certain conditions are stated with greater specificity than the original Conditions of Certification presented in the SA. Rather, the effect of these provisions in relation to staff’s recommended Conditions are mainly procedural, consolidating the reporting of those measures into two documents, called the ‘Facility Visual Enhancement Plan’ and the ‘Seawall Design Plan,’ that may be reviewed at one time in two final documents by the Coastal Commission Executive Director prior to approval by the Energy Commission.

With the recommended changes enumerated in the specific provisions of its findings of March 6, 2002, the Coastal Commission stated that it believed the visual aspects of the proposed facility would be consistent with the policies of the Coastal Act, but reserved the right to comment further on subsequent proposals as they became more specific and detailed. ■

Applicant's Visual Enhancement Proposals and Response of Agencies and Staff

Outstanding Visual Issues Following Publication of SA

Several visual issues workshops were held in El Segundo to resolve the remaining visual issues subsequent to the publication of the SA. Some of these issues, relating to terms of staff-recommended Conditions of Certification on night lighting, temporary landscape screening, and landscaping of parking areas, administration building perimeter, and site perimeter, were resolved in workshops focusing on refinement of Conditions of Certification held in July, 2001.

Remaining issues then included the need for and ways to implement Condition of Certification **VIS-4** (architectural screening); a request for an earthen berm on the site's southern boundary made by Intervenors Murphy and Perkins; and concerns of the City of Manhattan Beach over paving of the post-construction tank farm area.

Architectural Screening

Background on this issue was provided in the discussion above. The Cities and the Coastal Commission endorsed the measure. The applicant questioned the need for the measure. Ultimately, the Coastal Commission formally determined the need for such a measure to achieve compliance with the Coastal Act.

45th Street Berm

Intervenors Murphy and Perkins, residents of Manhattan Beach, requested that the applicant consider installation of a 20-foot- tall earthen berm along the site's 45th Street (southern) boundary, in order to achieve both visual and noise mitigation, as a part of the applicant's compliance with the visual enhancement requirements of the Coastal Act.

Neither Energy Commission staff, nor the Coastal Commission in its March, 2002, report, specifically recommended such a berm to achieve conformance with CEQA or with applicable LORS. However, neither Energy Commission staff nor the Coastal Commission staff are opposed to such a measure, which would enhance the appearance of the site from the vicinity of 45th Street in Manhattan Beach, providing certain conditions are met.

Energy Commission staff, the Coastal Commission staff, and the City of Manhattan Beach support berm configurations that would not result in substantial Bay view blockage, but would provide some screening of views into the site. Coastal Commission staff has recommended that berm landscaping not include invasive non-native plant species, consistent with specific provisions of the Coastal Commission findings of March 5, 2002. Views from 45th Street into the site are currently characterized by large oil storage tanks, and after project construction, would, without the berm, consist of views of a paved asphalt area to be used for parking, staging and maintenance, partly screened by perimeter landscaping as described in the perimeter landscape plan.

Paved Tank Farm Area

At a workshop on May 22, 2002, and in a letter to the Energy Commission responding to the Visual Enhancement Proposals dated June 20, 2002, the City of Manhattan Beach expressed additional concerns about the visual effects of the ultimate replacement of existing oil storage tanks with an asphalt surface (COMB 2002d). The City proposed leaving the area not used for parking unpaved, and hydroseeding and irrigating it when not in use for staging purposes.

Applicant's Visual Enhancement Proposals

At a May 22, 2002, workshop the applicant presented a revised plan to achieve the architectural screening proposed in Condition of Certification **VIS-4**, and a major berm construction and landscape enhancement along the 45th Street boundary of the ESPR site, in response to concerns of Intervenors Murphy and Perkins. These proposals are consolidated in applicant's Visual Enhancement Proposals (ESPR 2002v), as subsequently amended and explained by a Project Description Amendment, dated June 17, 2002 (ESPR 2002aa; ESPR 2002cc), and have been described above under Visual Project Description.

Banner Screening System

Simulated representations of the proposed architectural screening or 'banner' proposal and 45th Street Landscaped Berm are depicted in **VISUAL RESOURCES Figure 13** (KOP 7 Architectural Treatment Option No. 4) (ESPR 2002cc (Additional simulations may be found in Appendix C of Visual Enhancement Proposals, ESPR 2002v).

As depicted in **Figure 13** and described above, the proposed architectural screening would consist of three retractable horizontal banners of polyethylene fabric of partial transparency. Large open areas remain unscreened between each of the horizontal banners, and the top portions of the HRSG superstructure remain unscreened. Consequently, both Energy Commission and Coastal Commission staff indicated that while the approach appeared to have potential, the applicant should investigate whether more complete coverage of the structures was possible. In addition, Coastal Commission staff indicated that the applicant should also investigate similar screening of existing Units 3 and 4, and of the Unit 6 Steam Turbine Generator (STG) pipe racks visible from the beach, and requested additional information on durability of the fabric, and the feasibility of using more opaque fabric.

In its response to questions raised at the workshop, the applicant presented in its Project Description Amendment dated June 17, 2002, arguments why more complete screening of new units, and screening of the STG pipe racks and existing units, would be infeasible (ESPR 2002aa). Briefly, these included issues such as piping penetrations of the HRSG superstructure frame, which would interfere with placement of more complete screening, and potential interference with maintenance by more complete screening. Screening of visible STG pipe racks was said to be infeasible due to potential interference with inspection and maintenance. Regarding greater material opacity, the applicant indicated it would investigate this further during the detailed design phase. While these arguments have been noted by staff, staff also concluded that insufficient evidence has been provided to date to substantiate these various claims

of infeasibility or to devise potential solutions for more adequate screening, as discussed further below under staff discussion of Coastal Act conformance.

45th Street Berm

A full description of the proposed berm has been presented above under Visual Project Description. The plan of the proposed berm is depicted in Appendix B of the Visual Enhancement Proposals (ESPR 2002v) and reproduced here as **VISUAL RESOURCES Figure 14**. A simulation of this proposal as seen from an adjacent residence is depicted in **VISUAL RESOURCES Figure 15** (Landscaped Berm Simulation)(ESPR 2002v). Coastal Commission staff have indicated that the proposed berm is 'an appropriate and feasible measure,' and that the proposed 7-foot-tall berm, combined with landscaping, represented a reasonable balance between screening of the industrial elements of the site while maintaining coastal views. Coastal Commission staff noted that a taller berm, as proposed by Murphy and Perkins, would result in additional adverse traffic and erosion impacts due to the need for several hundred truckloads of additional fill. In accordance with specific provisions of the Coastal Commission findings of March 6, 2002, Coastal Commission staff also recommended that the landscape plantings on the berm and elsewhere should consist of native and drought resistant species or at least, non-invasive species (CCC 2002c).

Updated Landscape Concept Plan

An updated landscape plan dated April 23, 2002 was also submitted with the Visual Enhancement Proposals, and is reproduced here as **VISUAL RESOURCES Figures 16A and B**. Principal features of this plan are described above under Visual Project Description, and include design enhancements of the seawall at the northwest corner of the site. As depicted, the landscape plan is not completely consistent with the berm plan because it does not reflect the proposed layout of the berm, nor the appearance represented in the visual simulations included in the Visual Enhancement Proposals. However, it is assumed that these preliminary plans will be refined and reconciled in response to comments prior to submittal of final plans. Coastal Commission concerns that native or, minimally, non-invasive non-native plants be selected apply to the Landscape Plan as well as the berm.

Current Status of Responses to Visual Enhancement Proposals

Coastal Commission

Coastal Commission staff submitted to the Energy Commission staff a written response to the Visual Enhancement Proposals and Project Description Amendment in a letter dated July 31, 2002 (CCC 2002e). The purpose of the letter was to discuss whether the measures proposed conform to the specific provisions issued by the Coastal Commission in its findings of March 6, 2002, and is summarized in the following paragraphs.

Coastal Commission staff acknowledged that a final comprehensive visual enhancement plan, as called for in the specific provisions, has not yet been developed or submitted and that they believe the applicant is working toward a plan adequate to

meet those provisions. However, the proposals to date do not yet conform to the Commission's specific provisions.

The shortcomings of the proposals fall into two general categories: failure of the proposals to meet certain specific requirements of the provisions; and insufficient information on the feasibility of accomplishing the provisions of the Commission's findings.

Specific provision #1a called for all industrial equipment below elevation 125 feet and visible from public areas be screened. However, the applicant's proposals provide only incomplete screening. The proposals leave large areas of the superstructure of the new units remaining unscreened, and no screening on the two existing units.

In explaining their concern about insufficient information on feasibility, Coastal Commission staff state in the July letter that the "documents submitted thus far do not provide the necessary level of detail to determine whether various visual enhancement elements are infeasible.... For example, the applicant has expressed concerns about the weight of the banner material and the wind loading that could occur, but has not presented a quantitative analysis of how much weight or wind load the facility could handle.... [T]he applicant has expressed concerns that complete coverage of the facility would increase risk to workers and equipment ... but there is little explanation or quantification of how or why this would occur.... We therefore reiterate the provision that the facility be screened below the 125' elevation or that the applicant provide a thorough, detailed, and site-specific analysis of why it is not feasible to screen particular locations of the facility."

Additional comments on the banner concept included recommendations for use of a denser opacity material unless thorough evaluation of wind loading and weight shows that more opaque material is not feasible; and a recommendation that the applicant be required to replace banner material no less often than the length of the manufacturer's warranty. Other comments included endorsement of the berm plan as proposed; and a recommendation that, in order to meet Specific Provisions #1b and #2b, that native and non-invasive non-native plants be used in the proposed landscape plantings. The Coastal Commission staff received an updated plant list from the applicant consisting of several dozen California native plant species described as suitable for the proposed project (cited as Memo #JN 10-101281.001, July 25, 2002 in CCC 2002e). Coastal Commission staff stated it believed this list of plant species would meet the intent of the Coastal Commission's special provisions and recommended that the Energy Commission require the use of this list as the basis for the facility's landscape plan.

On September 5, 2002, Coastal Commission staff responded to an Energy Commission staff request for a status report on issues of conformance of the proposed project with prior Coastal Commission findings and specific provisions relating to a variety of issues, including visual enhancement. As stated in that letter, absent further information from the applicant, Coastal Commission staff's evaluation of the proposed enhancements remains as stated in the July 31 letter. As described above, the most recent proposals do not yet provide the level of screening and enhancement called for in the specific provisions, and do not provide the level of detail necessary to support the applicant's

claims that certain visual enhancement measures such as more complete architectural screening of Units 5 and 7, and screening of Units 3 and 4, were infeasible. (CCC2002f)

However, Coastal Commission staff has consulted with Energy Commission staff since the preparation of the July letter. Information developed by Energy Commission staff in that period suggests that the configuration and outer structure of Units 3 and 4 may preclude architectural screening of Units 3 and 4 as a feasible screening measure, as discussed in detail below. Coastal Commission staff indicated that if an adequate feasibility assessment by the applicant were to establish that this is actually true, then it might be acceptable to use measures other than banners attached directly to the units in order to provide adequate screening (additional landscaping, architectural screening in locations away from the units, etc.) pursuant to the specific provisions. Coastal Commission staff recommends that new information, feasibility assessments, and enhancement measures should be submitted as part of a comprehensive updated proposal (CCC2002f).

City of El Segundo

In its letter of June 20, 2002 (COES 2002c), the City of El Segundo stated that it “believes the proposed banner configuration ... will provide visual enhancement of the area as required by the Coastal Act, but does not fully meet the requirements of the Coastal Act.... The City believes additional screening of the (HRSGs) is warranted. The City also believes that the steam turbine generator ... should also be screened from the west side to provide uniformity of the screening.”

The City concurs with the Coastal Commission staff on the insufficiency of feasibility analysis of screening options: “Without more detailed elevation drawings of the HRSG units, it is difficult to visualize how the various penetrations might prevent more of the units from being screened, as suggested by the applicant....”

Other comments by the City of El Segundo included endorsement of the 45th Street berm concept, and acknowledgement that strict interpretation of the City’s vehicle use area landscaping ordinance might not be appropriate. The City instead recommended relocation of some trees shown in the Landscape Plan to the north and west side of the tank farm area to integrate the appearance of these berms with the proposed berm. The City states that with this change, “all specific LORS conformance issues related to landscaping will have been addressed....”

City of Manhattan Beach

In a letter dated June 25, 2002, the City of Manhattan Beach stated that it deferred to residents’ opinion on the banner screening proposal; strongly supported the proposed landscaped berm; recommended that *Myoporum* not be used on the berm; and reiterated a proposal that the current tank farm area, after construction, not be paved but left in an unpaved, hydroseeded condition. The City expressed concern with visual effects to neighbors of the large paved areas that would replace the existing storage tanks, following their ultimate removal as part of the ESPR project (COMB 2002d).

Intervenors

The Intervenors agreed with the applicant's proposal for a berm on the southern portion of the property and strongly emphasized the need for appropriate landscaping not only on the berm but also around the rest of the facility perimeter.

The Intervenors have taken a neutral to negative position regarding the banners and have suggested that additional landscaping is preferable to expending funds on banners that the community feels are unnecessary and an increase in the chaotic views. These views were expressed at both the workshops of May 22 and June 11, 2002 and in writing (Cripe 2002b; Murphy Perkins 2002b).

Staff Discussion

In general Energy Commission staff concurs with the above opinions of participating agencies, and has additional concerns that need to be addressed either before or after certification.

In particular staff has heretofore accepted the applicant's banner proposal as a potential solution to the need for visual enhancement of the proposed and existing power plants, and believes that the concept could be a viable one. However, staff does not believe that it has yet received sufficient information to have confidence that the proposed approach would be both reliable and effective. For example, can the applicant reasonably assure that the proposed screening can in fact be applied in an attractive way to form a reasonably taut, stable and uniform surface, capable of withstanding anticipated wind loads without tearing, sagging, discoloration, or unsightly mounting supports? Consequently, Condition **VIS-4** has been modified to include performance criteria that a banner system, if adopted, shall meet.

Subsequent to filing of applicant's Project Description Amendment, staff has investigated and documented instances of the use of screening similar to that proposed by the applicant. **VISUAL RESOURCES Figure 18a** depicts a structure for screening mechanical equipment utilizing plastic mesh fabric required by the City of Emeryville, California on an industrial facility. These photographs illustrate both the effectiveness of mesh fabric to provide visual screening, and potential problems that may arise (i.e., tearing and sagging). In this example, the fabric used was light-weight *woven* plastic mesh, not the more robust *knitted* plastic fabric proposed by the applicant. **VISUAL RESOURCES Figure 18b** depicts an installation of knitted plastic fabric very similar to that proposed by the applicant, used for visual screening. These photographs appear to illustrate a taut, uniform surface and absence of tearing, as well as effective visual screening. This example was identified by the material supplier as 60 percent opacity fabric (Stephens, 2002). Staff concluded from this investigation that the method proposed could be feasible, if its application meets the standards of performance described in revised Condition **VIS-4** below. These performance standards include stable, taut, uniform mounting of the material capable of withstanding anticipated wind loads without sagging, tearing, unsightly discoloration, or adverse visual effects from the mounting system itself; and with sufficient durability to allow good performance between maintenance cycles.

In the view of Energy Commission staff the partial screening depicted in the Visual Enhancement Proposals partially achieves the screening objectives stipulated under Condition of Certification **VIS-4**. However, the concept of three horizontal banners leaves large areas of piping and mechanical equipment exposed. Ideally, a larger proportion of coverage, and a somewhat higher level of screening opacity would be desirable. The appearance of the applicant's proposal is somewhat lacking in unity of the visual profile and structural envelope, as a result of the intermittent coverage, particularly the uncovered upper portions of the superstructure, which define the architectural silhouette. Nevertheless, as depicted the proposal appears preferable to no mitigation at all.

However, Energy Commission staff concurs with the Coastal Commission and City of El Segundo that a convincing demonstration that more complete coverage of Units 5, 6 and 7, and of Units 3 and 4, is infeasible has not been provided in the Visual Enhancement Proposals and Project Description Amendment. Information provided to establish feasibility or infeasibility lacks both the scope and level of detail needed for staff to make an informed decision. For example, penetrations by piping of the superstructure's outer plane is provided as evidence of infeasibility, yet the concept as described by the applicant demonstrates the method by which protruding piping could be accommodated (see **VISUAL RESOURCES Figure 19, Detail of Banner**). Further, the renderings of the proposed plants with and without mitigation do not depict the kind of outer plane penetration by piping to which the feasibility discussion refers. Is the routing of piping outside the superstructure unavoidable and so frequent as to represent an insurmountable obstacle, and if so, why and where? It has not, for example, been sufficiently explained why a design capable of accommodating the desired screening cannot be specified as a performance criterion in the plant design specifications. Coastal Commission staff has recommended a higher degree of screening opacity than currently proposed, and the proposed material has been described as transparent to the wind, yet no detailed analysis has been provided to explain why a higher degree of screen opacity would not be feasible. Plant safety has been cited as a reason for infeasibility of complete screening, but how the presence of semi-transparent fabric, or the activity of opening and closing the proposed 'curtains' at the time of maintenance work would pose a safety hazard has not been explained. Further, in what way would more complete banner coverage represent a greater safety hazard or interference with maintenance activities than the proposed partial coverage? Inability to prevent the fabric from sagging is cited as the reason for infeasibility of covering the pyramid shaped top of the superstructure. Yet it would seem that the fabric, which is very light, could be supported by very light-weight, simple supporting members that could attach to the superstructure and serve as a supporting frame. Unavailability of wider fabric has been cited as a reason for partial coverage, yet staff conversations with fabric suppliers suggests that wider widths can be created by sewing of individual pieces to achieve greater widths (Sharp, 2002). These instances serve as examples of the level of design specificity that would enable a substantive evaluation of feasibility by staff to take place. They also serve to illustrate the fact that a meaningful evaluation of feasibility of such measures is difficult without reference to a specific, concrete project design.

Coastal Commission Specific Provision #1a recommends that "if the applicant proposes, and the [Energy Commission] concurs, that it is impractical or infeasible to shield portions of the facility using architectural screening, the applicant may instead

propose other measures such as landscaping, berms, or fencing to provide the necessary screening.” Energy Commission staff suggests that if, in fact, the applicant provides sufficient detailed information to establish infeasibility of more complete coverage of the structures with a banner system or other means, then this deficiency should be compensated by other methods as suggested in this provision. For example, in staff’s professional opinion it would be possible to substantially enhance screening of upper portions of the existing units and proposed HRSG structures as seen from Vista del Mar by more extensive, modified landscaping designed with the specific aim of increasing screening of existing and proposed structures while preserving existing Bay view corridors. A combination of closely spaced plantings of appropriately selected tall evergreen street trees with high canopies, along with a mix of low, medium and tall roadside shrubs distributed so as to leave the intermittent view corridors to the Bay in the vicinity of the plant open and unobstructed, would preserve those Bay views while still substantially screening views of the power plants. While this would take effect only in the long term and would not provide complete screening in views from portions of the beaches, in combination with the partial architectural screening proposed to date, such enhanced landscaping could nevertheless represent a substantial improvement to the proposal as it now stands, benefiting many hundreds of thousands of viewers on Vista del Mar each year. It would also be easily achieved. Staff also observed that additional trees shown on the western facility perimeter northwest and southwest of Units 3 and 4 added under the revised Conceptual Landscape Plan dated April 23, 2002 could, with a sufficiently tall and dense canopy, have a substantial screening effect on upper portions of the visible façades of Units 3 and 4 as seen by pedestrians from the adjoining beach-side bike path in the long term (i.e. at tree maturity).

Staff has documented the current visual condition of existing Units 3 and 4. Photographs of these units are included here as **VISUAL RESOURCES Figure 20**.

VISUAL RESOURCES Figure 20A depicts the north and south facades of Units 3 and 4, respectively. As the views depict, approximately the lower three-quarters of the façade appear to be enclosed by a somewhat complex steel superstructure, with the worker access walkways and railings located largely within that superstructure. There appear to be a variety of protruding features, including the large crane gantry platform, and various mechanical features penetrating the outer superstructure plane that would currently present obstacles to mounting of screening. It is possible that structural modifications or additions of some kind would be necessary to mount screening material in these areas.

As depicted in these close-up views, approximately the upper one-quarter of the plant’s walkways and equipment are not enclosed by a superstructural frame. Screening of these upper portions of the plant would thus require the construction of some sort of additional structural enclosure.

Figure 20B depicts portions of the western and eastern facades of Units 3 and 4, respectively. A large portion of these facades are enclosed by solid metal housing. Equipment between the two generating units expose piping and mechanical equipment, and are not enclosed by a superstructural frame. Screening of equipment between the generating units could thus require introduction of additional structural support.

Figure 20C depicts views of Units 3 and 4 from Vista del Mar, showing existing perimeter vegetation along the road, as well as existing Bay view corridors between generating units. In staff's opinion, these photographs illustrate an isolated existing example of how properly designed perimeter landscaping, if applied generally in a similar fashion along the Vista del Mar frontage, could potentially screen much of Units 3 and 4 as seen from the road, while preserving Bay view corridors where they exist. Currently, such screening is very spotty and in somewhat run-down condition, and has not been designed to specifically preserve Bay views. However, this example serves to demonstrate the principal by which screening of structures and view preservation might both be achieved. In general, screening of Units 3 and 4 in this manner is much more feasible than screening of the proposed new units in the same manner, because Units 3 and 4 are set back much farther from the road than the proposed Units 5 and 7, which would loom over the roadway due to their greater proximity.

With regard to the berm proposal presented at the workshop on June 11, 2002, Energy Commission staff has no objections to the proposal and regards the proposal as an enhancement to this portion (south side of site) of the viewshed. Staff agrees with Coastal Commission staff that the proposed lower-elevation berm, in combination with landscaping, offers the optimal visual solution by allowing flexibility in retaining Bay view corridors, while allowing for as much screening of the site as may be desired by neighboring residents. It also minimizes potentially substantial construction impacts that could result from creation of a much larger earthen berm. View studies conducted by Energy Commission staff confirmed that a combination of berm and landscape screening with an overall height of 20 to 25 feet above street grade would substantially block views into the tank farm site from most adjacent residences, yet preserve newly created Bay views above the landscape screen as viewed from second story windows, where living areas of 45th Street residences are located. The net result of a visual barrier of this height would thus be both an increase in Bay views compared to the existing condition with tanks, and a substantial improvement in foreground visual quality.

Regarding plant selection, Energy Commission staff defers to the recommendations of the Coastal Commission staff, so long as adequate screening, erosion control, maintenance, and an attractive landscape design, can be achieved. As discussed previously, in their July 31 letter Coastal Commission staff cited a list of native plant species that could be used as the basis of proposed project landscape plantings, and which would meet Coastal Commission's concerns with invasive non-native planting on this site. Energy Commission staff believes this or similar lists of native and non-invasive plants could potentially fulfill the screening, aesthetic, and other objectives of the landscape plan as described in Condition of Certification VIS-2.

The proposed improvements to the seawall design appear to staff to be a substantial compensation for the loss of existing landscaping that would occur due to the project in that area of the site.

In response to City of Manhattan Beach proposals regarding the after-construction tank farm site, the applicant has argued that keeping the area in question unpaved would be infeasible. While the infeasibility of this measure seemed unclear, staff studied both existing views and potential views into the ESPR site from neighboring residences both

east and west of Vista del Mar, both with and without the proposed 45th Street berm and landscape measures, and at both ground and second story levels. Staff concluded that potential views of the after-construction asphalt site would, in the long term with planting maturity, be minimal from these off-site locations with the proposed landscaped berm measure (**VISUAL RESOURCES Figure 21**).

In determining compliance with the Coastal Act, Energy Commission staff gives due deference to the Coastal Commission. In accordance with the specific provisions set forth by the Coastal Commission and reproduced as proposed Condition **VIS-1**, approval of a final Facility Visual Enhancement Plan is required by the Energy Commission prior to construction. In light of the comments and discussion presented above, all information needed to reach resolution on the content of such a plan is clearly not yet available. However, the assumption of Condition **VIS-1** is that final, detailed resolution of the Visual Enhancement Plan may be achieved either before or, if necessary, after certification. In addition, Coastal Commission staff has indicated, and Energy Commission staff agrees, that the proposals to date are “a significant step forward in the applicant’s recognition of the visual impacts of both the existing and proposed facility” and that the applicant is “working towards submitting measures adequate to mitigate the facility’s adverse visual effects.” (CCC2002f)

Therefore, staff recommends that major issues relating to Coastal Act compliance should be resolved if possible prior to certification. Staff also recommends that if the Energy Commission certifies the project, it adopt all recommended Conditions of Certification in order to ensure Coastal Act compliance. Under the proposed Conditions, any remaining issues must be resolved prior to final approval of the Facility Visual Enhancement Plan, as recommended by the Coastal Commission and incorporated in Condition **VIS-1**.

RECOMMENDED MITIGATION MEASURES

Staff recommends the adoption of mitigation measures to ensure compliance with provisions of the Coastal Act, the City of El Segundo Zoning Ordinance, and to reduce potentially significant impacts to less than significant levels. These measures are described below.

COASTAL ACT CONFORMANCE

The California Coastal Commission determined that the project as originally proposed would not comply with requirements of Section 30251 of the Coastal Act. Therefore, in order to achieve compliance, staff recommends adoption of Conditions of Certification **VIS-1**, **VIS-2**, **VIS-3**, **VIS-4**, and **VIS-5** to restore and enhance this visually degraded area pursuant to Section 30251 of the Coastal Act. These measures are discussed in the paragraphs below.

Facility Visual Enhancement Plan and Seawall Design Plan (VIS-1)

In order to ensure conformity with the California Coastal Act, the specific provisions for the visual enhancement of the project presented in this Condition, written by the Coastal Commission, should be incorporated in the project. The measure re-states the

requirements of Conditions **VIS-2** through **VIS-5**, and provides a consolidated method for review by the Coastal Commission.

Perimeter Landscape Screening (VIS-2)

To partially screen vertically prominent features from off-site foreground viewpoints, the applicant should implement a perimeter landscape plan, similar to that depicted in the applicant's revised Conceptual Landscape Plan (ESPR, 2002v) and modified as feasible to incorporate recommendations by the Cities of El Segundo and Manhattan Beach and the Coastal Commission, following their review of final plans. At a minimum such plan shall include: continuous tree canopies on the eastern roadside perimeter to enhance visual unity of the road corridor, compatibility of the ESPR project with its coastal setting, and at least partial long-term screening of upper portions of the HRSGs; shrub plantings to screen views of the structures, while preserving perpendicular view corridors to the Bay; landscape screening along 45th Street reflecting comments by the City of Manhattan Beach and the Coastal Commission, to provide long-term screening of the tank farm site; tree planting on the western site perimeter to screen upper portions of Units 3 and 4 from the bike path; and landscape planting in the vicinity of the proposed seawalls as depicted in the revised Landscape Plan, in order to mitigate loss of landscaping in that area. The plan shall utilize native or non-invasive plant material.

Design Treatment of Seawall (VIS-3)

To mitigate adverse effects of the loss of 450 linear feet of existing landscaping west of existing Units 1 and 2, the applicant should install landscaping as described in the revised Landscape Plan and in recommended Condition of Certification **VIS-2**; and treat the proposed seawall in this location with mitigating surface texture treatment as described under Condition of Certification **VIS-3** in order to enhance design quality, reduce visual monotony, and reduce likelihood of attracting graffiti.

Architectural Screening of Power Plant (VIS-4)

In order to screen the visual blight of highly chaotic exposed mechanical equipment and piping on the HRSG structures of Units 5, 6 and 7, the applicant should utilize architectural panels or other means to visually screen piping and interior machinery to the maximum extent feasible. In order to meet the level of enhancement called for by the Coastal Commission, such screening should also be applied to exposed mechanical equipment on existing Units 3 and 4, to the maximum extent feasible.

Staff recommends that if the applicant provides sufficient detailed information to establish infeasibility of more complete coverage of the structures with a banner system or other means, then this deficiency should be compensated by other methods, such as modified landscaping, as suggested in the specific provisions stipulated by the Coastal Commission.

Structure Surface Painting and Treatment (VIS-5)

In order to mitigate visual contrast and chaos of the facility's industrial features, the applicant should paint exterior portions of the visible to the public in a harmonizing color or colors with a low gloss finish to blend with the surroundings and eliminate potential reflective glare to motorists.

EL SEGUNDO LORS CONFORMANCE

On-Site Landscaping (VIS-2)

In order to ensure compliance with applicable zoning codes of the City of El Segundo (Title 15, Chapter 2, Sec. 15-2-14) pertaining to on-site landscaping, staff has incorporated this requirement into Condition **VIS-2**, as requested by the City of El Segundo and agreed to by the applicant.

MITIGATION OF POTENTIALLY SIGNIFICANT IMPACTS

Potentially significant impacts identified under the proposed project would be reduced to less than significant levels by the measures described below.

Permanent and Construction Night Lighting for Existing and Proposed Units (VIS-6, VIS-7 and VIS-8)

To mitigate potentially significant night lighting impacts, the applicant should implement shielding and controls of night lighting as described in applicant's Tank Farm Plan, and in Conditions of Certification **VIS-6**, **VIS-7** and **VIS-8**.

Temporary Landscaping (VIS-9)

In order to mitigate potentially significant construction impacts to residents along 45th Street, the applicant should install temporary landscape screening in conjunction with implementation of the applicant-proposed Tank Farm Plan.

FACILITY CLOSURE

INTRODUCTION

There are at least three circumstances in which a facility closure can take place, planned closure, unexpected temporary closure, and unexpected permanent closure.

PLANNED CLOSURE

Planned closure occurs when the facility is closed in an anticipated, orderly manner, at the end of its useful economic or mechanical life, or due to obsolescence. At the end of the ESPR Units 5, 6 and 7 economic, mechanical, or operational life, the project owner shall prepare and submit a closure plan describing procedures and timetable for the complete removal of the power plant structures and the transmission poles to reduce visual impacts.

UNEXPECTED TEMPORARY CLOSURE

Unexpected temporary closure occurs when the facility is closed suddenly and/or unexpectedly, on a short-term basis, due to unforeseen circumstances such as a natural disaster, or an emergency. No special conditions regarding visual resources are expected to be required to address temporary closure.

UNEXPECTED PERMANENT CLOSURE

Unexpected permanent closure occurs if the project owner closes the facility suddenly and/or unexpectedly, on a permanent basis. This includes unexpected closure where

the owner remains accountable for implementing the on-site contingency plan. It can also include unexpected closure where the project owner is unable to implement the contingency plan, and the project is essentially abandoned. The contingency plan that the project owner is required to prepare shall address removal of the power plant structures to reduce visual impacts in the event of unexpected permanent closure.

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

Because potential project impacts of the ESPR have been evaluated against the baseline of strong existing visual impacts of the ESGs, few significant impacts were identified under CEQA. However, staff does not regard either the existing ESGs or unmitigated ESPR as visually compatible with their scenic coastal setting as viewed from high sensitivity foreground viewpoints on Vista del Mar and Dockweiler and Manhattan State Beaches. The California Coastal Commission concurred with this opinion, finding the project setting to be 'visually degraded' pursuant to section 30251 of the Coastal Act. The Coastal Commission recommended that specific provisions, reproduced in proposed Condition of Certification **VIS-1**, be implemented if the project is certified, pursuant to Section 25523(b) of the Warren-Alquist Act. This condition essentially brings together the requirements of Conditions **VIS-2**, **VIS-3**, **VIS-4**, and **VIS-5**, and gives them definition and specificity in the form of two consolidated plans, for review by the Executive Director of the Coastal Commission and approval by the Energy Commission.

With implementation of applicant's proposed Tank Farm Plan (ESPR 2000x) and staff's recommended Conditions of Certification **VIS-6** through **VIS-9**, project impacts would be mitigated to less than significant levels.

With implementation of the proposed Tank Farm Plan and proposed Conditions of Certification **VIS-1**, **VIS-2**, **VIS-3**, **VIS-4**, **VIS-5**, and **VIS-9**, visual/aesthetic characteristics of the project site as seen from sensitive foreground viewpoints would be enhanced, pursuant to Section 30251 of the Coastal Act, and the project would conform with all applicable LORS. As discussed above, the applicant's visual mitigation plans as currently proposed are not adequate to meet these requirements, so the project as currently proposed does not yet meet the requirements of the California Coastal Act.

RECOMMENDATIONS

In its March 6, 2002, report, the Coastal Commission found that, with implementation of the specific provisions outlined in its letter and reproduced in proposed Condition of Certification **VIS-1**, the visual aspects of the proposed facility will be consistent with the policies of the Coastal Act (CCC 2002a). The Coastal Commission made clear in its report that the project did not meet the requirements of the specific provisions either as initially proposed by the applicant or based on the Conditions of Certification proposed in the June 2001 Staff Assessment.

After the March 2002 Coastal Commission recommendation was issued, the applicant proposed additional screening using berms, landscaping, and a series of banners on

the power plant structures. Energy Commission staff, Coastal Commission staff, and the City of El Segundo, have each stated that they do not consider the project as initially proposed or as currently proposed by the applicant, to fulfill the requirements specified by the Coastal Commission.

The Coastal Commission has recommended screening of the industrial equipment, either through architectural screening if feasible or through other measures, and that a comprehensive visual enhancement plan be approved prior to the start of construction. Staff believes that the nature of the screening of this project (e.g. architectural v. landscaping), given the project's location, is something that should be resolved as early as possible. Although the Coastal Commission's specific provisions allow for resolution of such issues after certification (though prior to construction), the approval of required plans is left to the Energy Commission and not staff. Therefore, staff recommends that, if at all possible, the visual enhancement plans required under Condition of Certification **VIS-1** be developed in time for review and approval by the Energy Commission as part of the certification process. If these plans are not approved as part of the certification decision, adoption and implementation of Condition **VIS-1** will be adequate to ensure conformance with the Coastal Act. If the Energy Commission certifies the project, staff recommends adoption and implementation of all of the proposed Conditions of Certification in order to ensure that the project is built and operated consistent with all LORS and that the project will not result in any significant impacts.

PROPOSED CONDITIONS OF CERTIFICATION

VIS-1 Facility Visual Enhancement Plan. Before starting construction, the project owner shall complete a comprehensive visual enhancement plan that includes architectural screening, landscaping, painting, lighting, and other measures that result in an overall enhancement of views of the facility from areas accessible to the public. The plan shall be made available for review and comment by the Executive Director of the Coastal Commission and for review and approval by the Energy Commission. The plan shall include:

Architectural screening: All industrial equipment below elevation 125' (i.e., below the elevation of the outlet dampers on the facility's exhaust stacks) and visible from the beach, coastal waters, Vista Del Mar Avenue, and other areas accessible by the public shall be screened using panels, wire mesh, louvers or other forms of architectural screening. The screening shall be opaque or semi-transparent and have a non-glare finish, and the color shall be harmonious with the facility's setting on a public beach. If the project owner proposes, and the Energy Commission concurs, that it is infeasible to shield portions of the facility using architectural screening, the project owner may instead propose other measures such as landscaping, berms, or fencing to provide the necessary screening. Any such proposal must be based on the definition of feasibility in Coastal Act section 30108 and is subject to review and comment by the Executive Director of the Coastal Commission, and review and approval by the Energy Commission.

Landscaping: Where used to screen the facility, vegetation chosen shall be selected or maintained to provide year-round screening (e.g., evergreen species). Preference shall be given to native species and/or species requiring little or no irrigation, or at a minimum, non-invasive species.

Other structural screening: Where berms, fencing, or other structural elements are selected as the primary method to screen the facility, the structures shall harmonize with the facility's setting on a public beach. If berms are used, they shall be vegetated and maintained with evergreen, native, and/or species requiring little or no irrigation. If fencing is used, it shall include a non-glare finish or be painted in a neutral color.

The Facility Visual Enhancement Plan shall include photographs showing existing conditions and simulated post-construction conditions from Key Observation Points (KOPs) around the facility (these may be the same KOPs that were used to develop the Staff Assessment). The plan shall also include anticipated costs for completing and maintaining the various visual enhancement measures and a detailed schedule for completing construction of these components.

Seawall Design Plan: Before starting construction, the project owner shall complete a plan of the seawall design for review and comment by the Executive Director of the Coastal Commission, and for Energy Commission review and approval. This plan shall include:

Final design: The seawall along the west side of the facility shall be textured and finished in a neutral color harmonious with its location adjacent to a public bike path and beach. If painted, graffiti-resistant paint shall be used.

Landscaping: Where used to enhance the seawall design, vegetation chosen shall be selected or maintained to provide year-round screening (e.g., evergreen species). Preference shall be given to native species and/or species requiring little or no irrigation.

This seawall design plan shall include photographs showing the existing conditions and simulated post-construction conditions from observation points along the bike path adjacent to the seawall, from the beach, and from other points where the seawall is highly visible. The plan shall also include anticipated costs for completing and maintaining the seawall and a schedule for construction.

Verification: At least 120 days prior to the start of construction, the project owner shall submit the required Facility Visual Enhancement Plan and Seawall Design Plan to the Executive Director of the Coastal Commission and the Cities of Manhattan Beach and El Segundo for comment, and to the Energy Commission for review and approval. If the Energy Commission notifies the project owner that revisions of the submittal are needed before the Energy Commission will approve the submittal, the project owner shall prepare and submit to the Coastal Commission staff, the Cities, and Energy Commission a revised submittal.

VIS-2 Perimeter screening and on-site landscaping. The project owner shall prepare and implement an approved perimeter screening and on-site landscape plan.

The screening shall, at a minimum, utilize landscape opportunities on all four boundaries of the project site. Landscape screening shall include: continuous tree canopies on the eastern roadside perimeter to enhance visual unity of the Vista del Mar road corridor, compatibility of the ESPR project with its coastal setting, and at least partial long-term screening of upper portions of the HRSGs; shrub plantings along Vista del Mar to screen views of the structures, while preserving perpendicular view corridors to the Bay; plantings along 45th Street to provide long-term screening of the tank farm site; and tree planting on the western site perimeter to screen upper portions of Units 3 and 4 from the bike path. Landscape screening shall also include planting on the path (west) side of all new concrete walls constructed along the existing bike path. The plan shall comply with City of El Segundo Zoning codes (Title 15, Chapter 2, Sec. 15-2-14) pertaining to on-site landscaping.

Final plant selection shall be made in consultation with the Compliance Project Manager (CPM), Coastal Commission staff, and the Cities of Manhattan Beach and El Segundo. Suitable irrigation shall be installed to ensure survival and desired rate of growth. The landscape screening and irrigation system shall be monitored for a period of five years to ensure survival. During this period all dead plant material shall be replaced.

To achieve year-round screening, evergreen species shall be used. Spacing of trees shall be sufficiently dense to ensure substantial screening by the tree canopy at maturity.

Prior to start of construction, the project owner shall submit a landscape plan to the Coastal Commission and the Cities of Manhattan Beach and El Segundo for review and comment, and to the CPM for review and approval. The plan shall include, but not be limited to:

- 1) A detailed landscape, grading, and irrigation plan, at a reasonable scale, which includes a list of proposed tree and shrub species and installation sizes, and a discussion of both the suitability of the plants for the site conditions and mitigation objectives, and conformance with the specific provisions of the Coastal Commission decision, including 1b and 2b specifying preference for native, non-invasive, and drought tolerant species. A list of potential tree species that would be viable in this location shall be prepared by a qualified professional landscape architect familiar with local growing conditions, with the objective of providing the widest possible range of species from which to choose.
- 2) A demonstration of how the screening conditions shall be met, including:
 - evidence provided by a qualified landscape architect that the specified species are both viable and available;

- graphic documentation on the plan of Bay view corridors which would exist from Vista del Mar after project construction;
 - a description of tall and short shrub planting zones along Vista del Mar, such that screening of the existing and proposed power plants is maximized, while the aforementioned Bay view corridors are retained.
- 3) Elevation views or visual simulations of the landscape screening at maturity, in order to show the extent of screening that the landscaping is expected to achieve from the west side of the project, from 45th Street and from Vista del Mar.
 - 4) A detailed schedule for completion of the installation.
 - 5) Maintenance procedures, including any needed irrigation and a plan for routine and regular debris removal for the life of the project.
 - 6) A procedure for monitoring and replacement of all unsuccessful plantings for the life of the project.

The project owner shall not implement the plan until the project owner receives written approval of the plan from the CPM.

Verification: At least 120 days prior to the start of construction, the project owner shall submit the perimeter screening and onsite landscape plan to the Coastal Commission and the Cities of Manhattan Beach and El Segundo for comment, and the CPM for review and approval. If the CPM notifies the project owner that revisions of the submittal are needed before the CPM will approve the submittal, the project owner shall prepare and submit to the Cities and CPM a revised submittal.

The project owner shall implement the landscape plan prior to start of commercial operation.

The project owner shall notify the CPM within seven days after completing installation of the landscape plan that the planting and irrigation system are ready for inspection.

The project owner shall report landscape maintenance activities, including replacement of dead vegetation, for the previous year of operation in the Annual Compliance Report.

VIS-3 Design treatment of seawall. The project owner shall construct the proposed seawall with architectural design treatment to reduce visual monotony, enhance design quality and interest, and discourage graffiti. Techniques may include pre-cast or cast-in-place texturing, split-faced concrete block, or other methods feasible to produce a textured surface.

Prior to the start of construction, the project owner shall submit a design plan for the seawall to the Coastal Commission and City of El Segundo for review and comment, and to the CPM for review and approval. The treatment plan shall include:

- 1) Specification, and 11" x 17" color elevations, of the treatment proposed for use on the seawall;
- 2) A detailed schedule for completion of construction; and,
- 3) A procedure to ensure proper maintenance, including graffiti removal, for the life of the project.

Seawall construction shall not commence until the design plan has been approved by the CPM.

Verification: At least 120 days prior to start of construction, the project owner shall submit the seawall design plan to the Coastal Commission and City of El Segundo for review and comment and to the CPM for review and approval.

If the CPM notifies the project owner of any revisions that are needed before the CPM will approve the plan, the project owner shall submit a revised plan to the CPM.

Not less than 30 days prior to start of commercial operation, the project owner shall notify the CPM that the seawall is ready for inspection.

The project owner shall provide a status report regarding wall maintenance in the Annual Compliance Report.

VIS-4 Architectural screening of power plant. The project owner shall install architectural screening to cover the outer framework of the HRSG structures of the new proposed Units 5 through 7 and reduce visibility of mechanical equipment below 125 feet elevation of the superstructures to the extent determined to be feasible in the Energy Commission's decision. Such screening shall conform to the requirements of the Energy Commission's decision.

To the extent determined to be feasible by the Energy Commission in its decision, the project owner shall install similar architectural screening on existing Units 3 and 4 to conceal exposed piping and mechanical equipment.

Prior to the start of construction, the project owner shall submit an architectural screening plan to the California Coastal Commission (as a part of the facility Visual Enhancement Plan described in Condition **VIS-1**), and the City of El Segundo for review and comment, and to the CPM for review and approval. The screening plan shall include:

- 1) Detailed plans and specifications sufficient to enable the CPM and Chief Building Official (CBO) to determine adequacy and performance of the proposed screening. Determination of adequacy includes confirmation of consistency with the terms of the Energy Commission's decision.

Determination of adequacy also requires sufficient evidence that the screening can be installed to be stable, uniform, able to withstand anticipated wind loads, and attractively mounted, without sagging, tearing, unsightly discoloration, or adverse visual effects from the mounting system itself; and with sufficient durability to allow good performance between maintenance cycles. Required performance data shall include design information of sufficient detail and specificity to establish confidence in the design's ability to perform as desired, or to clearly establish limitations on the feasibility of particular measures.

- 2) 11" x 17" color simulations at life-size scale of the treatment proposed for use on project structures.
- 3) A detailed schedule for completion of the treatment.
- 4) A procedure to ensure proper treatment maintenance for the life of the project.

Verification: Not later than 120 days prior to start of construction, the project owner shall submit the final architectural screening plan and details to the Coastal Commission, the Cities of El Segundo and Manhattan Beach for review and comment, and the CPM for review and approval.

If the CPM notifies the project owner of any needed revisions before the CPM will approve the plan, the project owner shall submit a revised plan to the CPM.

Not less than thirty 30 days prior to the start of commercial operation, the project owner shall notify the CPM that the architectural screening is ready for inspection.

The project owner shall provide a status report regarding screening maintenance in the Annual Compliance Report.

VIS-5 Structure surface painting and treatment. Prior to the start of commercial operation, the project owner shall paint or treat portions of Units 5, 6 and 7 structures visible to the public, such that their colors minimize visual intrusion and contrast by blending with the landscape; their surfaces do not create glare; and they are consistent with local laws, ordinances, regulations, and standards.

Prior to the start of construction, the project owner shall submit to the Coastal Commission and the Cities of El Segundo and Manhattan Beach for review and comment, and to the CPM for review and approval, a specific treatment plan whose proper implementation will satisfy these requirements. The treatment plan shall include:

- a) Specification, and 11" x 17" color simulations at life size scale, of the treatment proposed for use on project structures, including structures treated during manufacture;
- b) A list of each major project structure, building, tank, transmission line tower and/or pole, and fencing/walls specifying the color(s) and finish proposed for

- each (colors must be identified by name and by vendor brand or a universal designation);
- c) Two sets of brochures and/or color chips for each proposed color;
 - d) Samples of each proposed treatment and color on each material to which they would be applied that would be visible to the public;
 - e) A detailed schedule for completion of the treatment; and
 - f) A procedure to ensure proper treatment maintenance for the life of the project.

The project owner shall not specify to the vendors the treatment of any buildings or structures treated during manufacture, or perform the final treatment on any buildings or structures treated on site, until the project owner receives notification of approval of the treatment plan by the CPM.

Verification: The project owner shall submit its proposed treatment plan at least 90 (ninety) days prior to ordering the first structures that are color treated during manufacture.

If revisions are required, the project owner shall provide the CPM with a revised plan within 30 (thirty) days of receiving notification that revisions are needed.

Prior to commercial operation, the project owner shall notify the CPM that all buildings and structures are ready for inspection.

The project owner shall provide a status report regarding treatment maintenance in the Annual Compliance Report.

VIS-6 Project lighting. Prior to the start of commercial operation, the project owner shall design and install new permanent lighting for Units 5, 6 and 7, such that light bulbs and reflectors are not visible from public viewing areas; lighting does not cause reflected glare; and illumination of the project, the vicinity, and the nighttime sky is minimized. To meet these requirements the project owner shall ensure that:

- a) Lighting shall be designed so exterior light fixtures are hooded, with lights directed downward or toward the area to be illuminated and so that backscatter to the nighttime sky is minimized. The design of the lighting shall be such that the luminescence or light source is shielded to prevent light trespass outside the project boundary;
- b) All lighting shall be of minimum necessary brightness consistent with worker safety;
- c) Wherever feasible and safe, lighting shall be kept off when not in use; and
- d) A lighting complaint resolution form (following the general format of that in Appendix VR-1) shall be used by plant operations to record all lighting complaints received and document the resolution of those complaints. All records of lighting complaints shall be kept in the on-site compliance file.

Verification: At least 60 days prior to ordering any permanent exterior lighting, the project owner shall submit to the CPM for review and comment written documentation describing the lighting control measures and fixtures, hoods, shields proposed for use, and incorporate the CPM's comments in lighting equipment orders.

Prior to first turbine roll, the project owner shall notify the CPM that the lighting has been completed and is ready for inspection. If the CPM notifies the project owner that modifications to the lighting are needed to minimize impacts, within 30 days of receiving that notification the project owner shall implement the modifications and notify the CPM that the modifications have been completed.

The project owner shall report any lighting complaints and documentation of resolution in the Annual Compliance Report, accompanied by any lighting complaint resolution forms for that year.

VIS-7 Site lighting. Prior to demolition of existing storage tanks, the project owner shall modify Unit 3 and 4 permanent lighting, such that light bulbs and reflectors are not visible from public viewing areas; lighting does not cause reflected glare; and illumination of the project, the vicinity, and the nighttime sky is minimized. To meet these requirements the project owner shall ensure that:

- a) Lighting shall be designed so exterior light fixtures are hooded, with lights directed downward or toward the area to be illuminated and so that backscatter to the nighttime sky is minimized. The design of the lighting shall be such that the luminescence or light source is shielded to prevent light trespass outside the project boundary;
- b) All lighting shall be of minimum necessary brightness consistent with worker safety;
- c) Project owner shall implement where feasible and practical modifications of circuits in order to allow turning off specific lights when not in use;
- d) A lighting complaint resolution form (following the general format of that in Appendix VR-1) shall be used by plant operations to record all lighting complaints received and document the resolution of those complaints. All records of lighting complaints shall be kept in the on-site compliance file.

Verification: At least 60 days prior to ordering of any new permanent exterior lighting for Units 3 and 4, the project owner shall submit to the CPM for review and comment written documentation describing the lighting control measures and fixtures, hoods, shields proposed for use, and incorporate the CPM's comments in lighting equipment orders.

Prior to demolition of the tanks, the project owner shall notify the CPM that the lighting modifications to Unit 3 and 4 have been completed and are ready for inspection. If the CPM notifies the project owner that modifications to the lighting are needed to minimize impacts, within 30 days of receiving that notification the project owner shall implement the modifications and notify the CPM that the modifications have been completed.

The project owner shall report any complaints about permanent lighting and provide documentation of resolution in the Annual Compliance Report, accompanied by any lighting complaint resolution forms for that year.

VIS-8 Construction Lighting. Prior to site mobilization, the project owner shall ensure that lighting for construction of the power plant is used in a manner that minimizes potential night lighting impacts, as follows:

- a) All lighting shall be of minimum necessary brightness consistent with worker safety.
- b) All fixed position lighting shall be shielded, hooded, and directed downward to minimize backscatter to the night sky and prevent light trespass (direct lighting extending outside the boundaries of the construction area).
- c) Wherever feasible and safe, lighting shall be kept off when not in use and motion detectors shall be employed.
- d) A lighting complaint resolution form (following the general format of that in Appendix VR-1) shall be maintained by plant construction management, to record all lighting complaints received and to document the resolution of that complaint.
- e) All construction-related lighting shall be completely shielded or screened so as not to be visible to residents of 45th Street in Manhattan Beach. Construction lighting in the tank farm area shall be limited to the hours of 7:30 a.m. to 6:00 p.m. except as necessary for safety or security purposes.

Verification: Within seven days after the first use of construction lighting, the project owner shall notify the CPM that the lighting is ready for inspection.

If the CPM notifies the project owner that modifications to the lighting are needed to minimize impacts, within 15 days of receiving that notification the project owner shall implement the necessary modifications and notify the CPM that the modifications have been completed.

The project owner shall report any lighting complaints and documentation of resolution in the Monthly Compliance Report, accompanied by any lighting complaint resolution forms for that month.

VIS-9. Temporary landscaping and 45th Street Berm. Temporary landscaping shall be installed prior to the start of ground disturbing activities at the site in those opportunity areas that do not create a hindrance to construction activities. Temporary landscaping shall be maintained for the duration of construction, and shall be designed to the extent feasible to be retained permanently as part of the perimeter landscaping plan required in Condition of Certification **VIS-2**. Installation of the 45th Street berm shall be initiated concurrent with construction of the new tank farm access road.

Prior to start of ground disturbance, the project owner shall submit a temporary perimeter landscape plan and final berm plan to the Cities of Manhattan Beach and El Segundo and the Coastal Commission for review and comment, and to the CPM for review and approval. The plans shall include, but not be limited to:

- a) A detailed landscape, grading and irrigation plan, at a reasonable scale, which includes a list of proposed tree and shrub species and installation sizes, and a discussion of the suitability of the plants for the site conditions and mitigation objectives. A list of potential tree species that would be viable in this location shall be prepared by a qualified professional landscape architect familiar with local growing conditions, with the objective of providing the widest possible range of species from which to choose. The plan shall demonstrate how the screening shall be met, including:
- b) Elevation views or visual simulations of the landscape screening at one year's growth in order to show the extent of screening that the landscaping is expected to achieve from the west side of the project, 45th Street and from Vista del Mar.
- c) A detailed schedule for completion of the installation.
- d) Maintenance procedures, including any needed irrigation and a plan for routine semi-annual debris removal for the life of the project; and
- e) A procedure for monitoring and replacement of unsuccessful plantings.

The project owner shall not implement the plan until the project owner receives written approval from the CPM.

Verification: At least 60 days prior to start of ground disturbance, the project owner shall submit the temporary perimeter landscape plan and final berm plan to the Coastal Commission and Cities of Manhattan Beach and El Segundo for comment, and to the CPM for review and approval. If the CPM notifies the project owner that revisions of the submittal are needed before the CPM will approve the submittal, the project owner shall prepare and submit to the CPM a revised plan.

The project owner shall notify the CPM within seven days after completing installation of the temporary landscape screening that the planting and irrigation system are ready for inspection.

The project owner shall notify the CPM within seven days after completing installation of the 45th Street berm that the berm is ready for inspection.

The project owner shall report landscape maintenance activities, including replacement of dead vegetation, for the previous month of construction in the Monthly Compliance Report.

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- CCC (California Coastal Commission/Luster) 2002d. Coastal Commission staff comments on cooling options and visual mitigation. Submitted to the California Energy Commission on June 28, 2002.
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- CCC (California Coastal Commission/ Luster). 2002f. Status of Coastal Commission staff review for AFC #00-014 – El Segundo Generating Station. Submitted to the California Energy Commission on September 5, 2002.
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- City of El Segundo (COES), 2002c. City of El Segundo response to May 2002 Visual Enhancement proposals and CEC Cooling Options Report POS. Submitted to the California Energy Commission on June 20, 2002.
- City of Manhattan Beach (COMB), 1988. General Plan.
- COMB 2002d. Regarding June 26th-Cooling Options and Visual Issues Workshop Comments POS. Submitted to the California Energy Commission on June 25, 2002.
- Cripe 2002ff. Letter to Energy Commission docketed August 9, 2002.
- ESPR (El Segundo Power Station) 2000a. Application for Certification. Submitted to the California Energy Commission on December 18, 2000.
- ESPR - 2000mm, Supplemental Responses to Visual Data Requests. Submitted to the California Energy Commission on May 16, 2001.
- ESPR 2000p. Visual and Noise Data Response. Submitted to the California Energy Commission on April 16, 2001.

ESPR 2000x. Response to CEC Data Requests, Set 4 – POS (including proposed Tank Farm Plan). Submitted to the California Energy Commission on May 04, 2001.

ESPR 2002v. Visual Resources Enhancement Proposals – POS. Submitted to the California Energy Commission on May 14, 2002.

ESPR 2002aa. Project Description Amendment – POS. Submitted to the California Energy Commission on June 17, 2002.

ESPR 2002cc. Full size KOP 7 Option 4 POS. Submitted to the California Energy Commission on June 24, 2002.

Murphy Perkins 2002b. Revised comments on proposed berm. Submitted to the California Energy Commission on June 10, 2002.

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LIGHTING COMPLAINT RESOLUTION FORM

EL SEGUNDO POWER STATION Los Angeles County, California
Complainant's name and address:
Phone number: _____
Date complaint received: _____ Time complaint received: _____
Nature of lighting complaint:
Definition of problem after investigation by plant personnel:
Date complainant first contacted: _____
Description of corrective measures taken:
Complainant's signature: _____ Date: _____
Approximate installed cost of corrective measures: \$ _____
Date installation completed: _____ Date first letter sent to complainant: _____ (copy attached) Date final letter sent to complainant: _____ (copy attached)
This information is certified to be correct:
Plant Manager's Signature: _____

(Attach additional pages and supporting documentation, as required.)

Appendix VR-2

[COPY of CCC LETTER HERE](#)

CALIFORNIA COASTAL COMMISSION

45 FREMONT, SUITE 2000
SAN FRANCISCO, CA 94105-2219
VOICE AND TDD (415) 904-5200
FAX (415) 904-5400



March 5, 2002

Mr. Robert Pernell, Presiding Commissioner
California Energy Commission
1516 Ninth Street
Sacramento, CA 95814

**RE: Coastal Commission Visual Findings on Application For Certification (AFC) #00-014
– El Segundo Generating Station**

Dear Mr. Pernell:

This letter provides the Coastal Commission's findings regarding the visual impacts of the above-referenced proposed project and its conformity with Coastal Act policies on visual resources. The proposed project involves removing two of four existing electrical generating units at the El Segundo Generating Station (ESGS) and replacing them with three new units. The proposal also includes removing two large storage tanks and extending an existing seawall along the west side of the facility adjacent to Dockweiler State Beach.

We are submitting this letter as part of the full review required pursuant to section 30413(d) of the Coastal Act. The California Energy Commission's (CEC's) enabling legislation, the Warren-Alquist Act, recognizes the CEC's exclusive jurisdiction to approve power plants of greater than 50-megawatt capacity within the coastal zone. Nevertheless, section 30413(d) of the Coastal Act authorizes the Coastal Commission to participate in the AFC review process by submitting to the CEC an analysis of the consistency of a proposed power plant project with, among other things, the policies of the Coastal Act. Subject to certain exceptions stated therein, section 25523(b) of the Warren-Alquist Act requires the CEC to include in its decision on the AFC "specific provisions" that the Coastal Commission determines to be necessary to bring the project into conformity with the policies of the Coastal Act.

This letter addresses the proposed project's conformity only with the visual resource protection policy of the Coastal Act. We have additional concerns about other elements of the proposal, including: 1) the adverse effects of its ocean cooling water intake system on marine biological resources; 2) its treatment of existing soil and groundwater contamination at the project site; 3) the increased risk of damage due to seismic events, liquefaction, and erosion; and, 4) other impacts associated with project construction. However, based on your staff's conclusion that the applicant will not be providing additional information regarding visual impacts and mitigation, at this time we are submitting only findings on visual impacts and mitigation measures. We intend to submit later in the review process additional findings on other issues related to the proposal's consistency with applicable Coastal Act policies. We also reserve our right to review additional information related to visual impacts and mitigation if the applicant or CEC provide such information. In addition, our staff will continue to be involved in your review and will evaluate additional information and provide data requests as needed.

Facility and Surrounding Area – Existing Conditions:

The El Segundo Generating Station (ESGS) is an industrial facility located on and adjacent to Dockweiler State Beach in El Segundo. The facility currently includes electrical generating units, exhaust stacks, fuel storage tanks, cooling water intakes and outfalls, and other equipment and buildings related to power generation. It is located adjacent to Vista Del Mar Avenue on the north and east, a residential area in the City of Manhattan Beach to the south, and Dockweiler and Manhattan State Beaches to the west, north, and south.

ESGS is the predominant visual element along a several mile stretch of Dockweiler and Manhattan State Beaches, in part because it consists of relatively large and highly visible power generating equipment, tall exhaust stacks (up to 224 feet high), and other related facilities, and in part because it protrudes out from the coastal bluffs on the east side of the site and extends onto the beach, interrupting the beach profile. The facility also predominates visually compared with other nearby facilities, such as the Chevron Tank Farm, the Scattergood Generating Station, and the Hyperion Water Treatment Plant. These other facilities mitigate for visual impacts by employing architectural screening, plantings, berms, and other elements.

The CEC's Staff Assessment determined that ESGS contrasts strongly with its highly scenic coastal setting and that the facility includes "visually chaotic" elements. Its high visual contrast, unscreened or partially screened industrial equipment, occasional vapor plumes, and location immediately on and adjacent to a recreational beach make it a significant contributor to the visual degradation of the immediate area. Additionally, the facility disrupts views to and along the coast and is not visually compatible with much of the character of the surrounding area. The other industrial facilities nearby are generally less obtrusive, due to their locations away from the beach and due to measures taken to reduce their visual impacts.

Review of Proposed Project:

In December 2000, the applicant submitted to the CEC an Application For Certification (AFC) for the proposed project. Coastal Commission staff has worked closely with the CEC staff, the applicant, and other interested parties to address concerns about the proposed project's conformity with various policies of the Coastal Act. Regarding visual impacts and mitigation measures, the Commission staff requested through letters of June 8, 2001 and October 4, 2001, and through comments at several meetings and workshops, that the applicant respond to various data requests on the visual components of the proposed project, and provide an evaluation of feasible visual mitigation measures. The applicant has not yet provided adequate responses to these requests and the CEC staff has concluded that the applicant will submit no further information on the subject of impacts on visual resources.

Summary of Proposed Project's Visual Impacts:

The primary visual changes resulting from the proposed project are:

- Replacing two existing electrical generating units with three new units, including two new exhaust stacks and other associated equipment. Overall, the new units will have taller exhaust stacks but will be less bulky than the existing units.
- Extending an existing seawall several hundred feet along the west side of the facility between ESGS and the adjacent bike path and beach.
- Removing two (approximately 180' diameter) fuel storage tanks at the facility's south end.
- Reducing visible vapor plumes during plant operations.

In addition, the proposal is expected to significantly extend the life of the current facility and will therefore increase the length of time the area will experience visual degradation due to the facility. The two units proposed for replacement are nearing the end of their useful life. The AFC states that the estimated economic life of the proposed project is approximately 30 years. Absent this proposed project, all or part of the ESGS facility would likely be removed, thus reducing the overall negative visual impact of the facility within a shorter timeframe.

To address visual impacts, the applicant has agreed to meet the City of El Segundo's ordinances related to landscaping requirements. This would provide some vegetative plantings in the interior and around the perimeter of the facility. The applicant has also agreed to design the seawall with curving surfaces and landscaping to add visual interest. Further, the applicant has discussed, but has not yet agreed to, other measures that would further reduce visual impacts of the existing and proposed facilities, such as covering some portions of the generating units and modifying the night lighting at ESGS.

CEC Staff Recommended Conditions:

The CEC Staff Assessment contains five recommended conditions of certification to address visual impacts:

- **Condition VIS-1** would require the applicant to prepare and implement a perimeter landscape screening plan (evergreen species only to ensure year-long screening) for all four sides of the facility.
- **Condition VIS-2** would require the applicant to construct the extended seawall using architectural treatments meant "to reduce visual monotony, enhance design quality and interest, and discourage graffiti." The final design would be subject to CEC approval and would include a maintenance plan for graffiti removal.
- **Condition VIS-3** would require the applicant to use architectural screening (such as pop-off panels, wire mesh, or other opaque or semi-transparent cladding) to cover the new generating units to reduce visibility of mechanical equipment. The final design would be subject to CEC approval and would include a maintenance plan.

- **Condition VIS-4** would require the applicant to paint or treat portions of the new generating units that are visible to the public and not screened by exterior paneling described under Condition VIS-3. The paint colors and finish would be selected to blend with the surroundings and eliminate potential reflective glare to motorists. The final design would be subject to CEC approval and would include a maintenance plan.
- **Condition VIS-5** would require the applicant to design and install lighting at the new units and modify lighting at the existing units to minimize night lighting impacts. The design would ensure that lighting is the minimum brightness necessary for operational safety, that lights are shielded and directed downward, and would including the use of motion detectors, where feasible, to further reduce lighting impacts. It is also to include a “lighting complaint resolution form” to document and respond to complaints from nearby residents.

Conditions VIS-1 through VIS-4 would require the applicant to submit the plans for approval before the start of the new units’ commercial operations. Condition VIS-5 would require the applicant to provide the lighting plan at least 60 days before ordering exterior lighting.

Project’s Conformity with the Visual Resource Protection Policy of the Coastal Act:

Section 30251 of the Coastal Act is the applicable policy for regulating the visual impacts of proposed development on coastal resources. Section 30251 states:

The scenic and visual qualities of coastal areas shall be considered and protected as a resource of public importance. Permitted development shall be sited and designed to protect views to and along the ocean and scenic coastal areas, to minimize the alteration of natural land forms, to be visually compatible with the character of surrounding areas, and, where feasible, to restore and enhance visual quality in visually degraded area.

The policy’s four requirements, and their applicability to the ESGS facility, are as follows:

Requirement 1: Permitted development shall be sited and designed to protect views to and along the ocean and scenic coastal areas: The CEC Staff Assessment (Section 4.11) determined, and the Coastal Commission concurs, that the ESGS facility contrasts strongly with its highly scenic coastal setting. It includes “visually chaotic” elements, such as extensive pipe and duct systems, scaffolding-type structures, exposed electrical system components, and the like, and stands out more strongly than other industrial facilities in the area. It protrudes out from coastal bluffs, interrupting the beach profile and interrupting views up and down the coast as well as views from inland towards the beach and ocean. Therefore, the Commission finds that the project, as proposed, does not conform to this Coastal Act policy.

Requirement 2: The development shall minimize the alteration of natural landforms: The existing ESGS facility includes a large steep retaining wall on its inland side, and a substantial seawall on the ocean side. The proposal includes extending and raising the existing seawall. The proposal may also require additional and as-of-yet-unknown shoreline alterations, as the CEC Staff Assessment recommends ongoing monitoring of beach erosion rates, which could result in the

applicant requesting further approval for additional shoreline hardening at some point in the future. Additional shoreline hardening is likely to result in changes to the beach profile and may cause increased erosion along nearby areas of the shoreline. Because the recommended monitoring has not yet been completed, we do not yet have the information necessary to determine likely impacts and mitigation measures necessary; therefore, the Commission finds that the proposed project does not conform to this Coastal Act policy.

Requirement 3: It shall be visually compatible with the character of the surrounding areas: As stated above, the CEC Staff Assessment found, and the Coastal Commission concurs, that the ESGS facility contrasts strongly with its setting, includes “visually chaotic elements” such as unscreened or partially-screened industrial equipment, and protrudes out from coastal bluffs to interrupt views from the beach. It is adjacent to, and visible from, beaches used by millions of visitors per year and a bike path used for coastal access and recreation. The proposed removal of large tanks on the southern part of the site will open coastal views from some areas accessible to the public, but will also result in more extensive views of the electrical generating units and associated facilities from the south of ESGS. Therefore, the Commission finds that the proposed project does not conform to this Coastal Act policy.

In instances such as this, when a proposed industrial development does not conform to one or more Coastal Act policies, the Commission may review it to determine if it is “coastal-dependent” and therefore able to be approved subject to provisions of Coastal Act section 30260. Section 30260 states:

Coastal-dependent industrial facilities shall be encouraged to locate or expand within existing sites and shall be permitted reasonable long-term growth where consistent with this division. However, where new or expanded coastal-dependent facilities cannot feasibly be accommodated consistent with other policies of this division, they may nonetheless be permitted in accordance with this section and Sections 30261 and 30262 if (1) alternative locations are infeasible or more environmentally damaging; (2) to do otherwise would adversely affect the public welfare; and (3) adverse environmental effects are mitigated to the maximum extent feasible.

Coastal Act section 30101 defines “coastal-dependent development or use” as “any development or use which requires a site on, or adjacent to, the sea to be able to function at all.” The proposed project is coastal dependent due to its current and proposed use of an existing ocean cooling water system. Recognizing that the proposal may change through future submittals, the Commission nevertheless finds that the current proposal is coastal dependent, and may therefore be found consistent with the Coastal Act if it mitigates its adverse environmental effects on coastal resources to the maximum extent feasible. Feasibility also is an issue of the fourth requirement of section 30251, as shown below, and is discussed in more detail later in this letter.

Requirement 4: In visually degraded areas and where feasible, the development shall restore and enhance visual quality: This requirement establishes a three-part test to determine conformity – (a) is the area visually degraded; (b) if so, are there measures that would restore or enhance visual quality; and, (c) if so, are those measures feasible?

- a) Is the area visually degraded? The CEC Staff Assessment determined that the ESGS facility contrasts strongly with its highly scenic coastal setting. It includes “visually chaotic” elements, and stands out more strongly than other industrial facilities in the area. It protrudes out from coastal bluffs, interrupting the beach profile and interrupting views up and down the coast as well as views from inland towards the beach and ocean. It is not visually compatible with much of the character of the surrounding area. Therefore, the Commission finds that the ESGS facility and the surrounding area are visually degraded, due in large part to the presence of the facility.
- b) If so, are there measures that would restore or enhance visual quality? There are a number of measures available that would enhance the visual quality of the facility and the area. Visual restoration or enhancement measures exist along a continuum – from relatively minor enhancements, such as partial screening with vegetation or the use of non-reflective paints, to much more significant visual enhancements, such as enclosing all or most of the facility within architectural screening, fencing, or other structural elements. The CEC Staff Assessment includes several recommended conditions intended to enhance the visual qualities of the facility, such as requiring the applicant to provide perimeter landscaping, architectural screening, painting, and special lighting.

However, while those conditions would appear to eventually result in visual enhancement of the facility, conformity with the Coastal Act, as stated above, requires that project-related impacts and mitigation be determined before making a permit decision rather than after. Because the recommended conditions in the CEC Staff Assessment would require plans be developed and submitted only after construction is completed, the Commission finds that additional measures are needed to ensure conformity with this requirement of the Coastal Act. These measures are further detailed below.

- c) If so, are those measures feasible? Section 30108 of the Coastal Act defines feasibility as “capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, social, and technological factors.” We can determine feasibility in several ways, including reviewing an applicant’s feasibility study or by determining what is feasible based on other information available to the Commission. Since, as stated above, the applicant has declined to respond to requests for an assessment of what visual enhancement measures would be feasible for this proposed project, the Commission must therefore conduct its own analysis.

In determining what is “feasible” under the definition in section 30108, the Commission believes it is appropriate to compare the proposed project to other nearby industrial facilities and other energy projects located elsewhere in California. As stated above, other industrial facilities near ESGS have included several extensive measures to mitigate visual impacts. The nearby Scattergood Generating Station, for example, is largely enclosed within architectural screening. The Chevron Refinery is screened from most viewpoints by a large vegetated berm. The Hyperion Treatment Plant includes both architectural and vegetative screening. These all provide examples of standard and feasible enhancement measures that

partially mitigate the adverse visual impacts of nearby coastal industrial facilities. For recent energy facilities subject to CEC reviews elsewhere in California, designs have included similar enhancement measures, such as architectural screening, vegetative treatments, landscaping, and other measures. For example, the CEC's Staff Assessments for Calpine's Metcalf and Russell City energy facilities describe extensive architectural screening and landscaping measures.

"Feasibility", as defined above, also takes into account economic considerations. In the case of the Metcalf and Russell City facilities mentioned above, CEC staff determined that the visual enhancement measures cost approximately \$10 million per facility. This represents about 2.5 to 3.3% of their total project costs of \$300 to \$400 million. Using the same percentages for visual enhancement at ESGS (with project costs estimated to be between \$350 and \$400 million) results in a "feasible costs" range of about \$8.75 to \$13.2 million. In addition, some visual enhancement measures are found to help reduce other costs associated with the facility. For example, the CEC staff determined, and the applicant has concurred, that architectural screening measures meant to improve the facility's visual quality would help reduce maintenance costs on some of the equipment currently exposed to salt spray from the ocean.

The Metcalf and Russell City facilities cited above, however, are not in the coastal zone, and their visual enhancement measures were based on factors other than conformity with the Coastal Act. For the ESGS facility, located near a highly scenic coastal setting used for recreation and public access, other components of feasibility, such as environmental and social considerations, may weigh more heavily in determining what measures are feasible.

Specific Provisions Needed to Provide Coastal Act Compliance:

We generally concur with the substance of the recommended conditions in the CEC Staff Assessment, and we consider those conditions to be within the range of feasible visual enhancement measures. However, as stated above, conformity with Coastal Act policies requires that the effects of a proposed project on coastal resources and measures necessary to mitigate those effects be known and evaluated before the impacts occur. If this proposed project were being reviewed for a coastal development permit, final mitigation plans would generally be required before permit issuance. While we recognize that the CEC's process allows for such plans to be approved after certification, we recommend that they be submitted for review and approval as early in the process as possible – if not before certification, then at least before construction begins.

We also recommend that the visual enhancement measures contained within the CEC Staff Assessment's recommended conditions be consolidated under a facility visual enhancement plan, as described below. This would allow a coordinated evaluation of the necessary visual mitigation measures and would provide an overall assessment of the facility's visual effects on the surrounding area.

Therefore, the Coastal Commission recommends that the CEC amend its conditions of certification to add the following conditions in order to mitigate “to the maximum extent feasible” the adverse visual effects of the proposed project as required by Coastal Act section 30260:

- 1) Facility Visual Enhancement Plan: Before starting construction, the applicant shall complete a comprehensive visual enhancement plan that includes architectural screening, landscaping, painting, lighting, and other measures that result in an overall enhancement of views of the facility from areas accessible to the public. The plan shall be made available for review and comment by the Executive Director of the Coastal Commission and for review and approval by the CEC. The plan shall include:
 - a) Architectural screening: All industrial equipment below elevation 125’ (i.e., below the elevation of the outlet dampers on the facility’s exhaust stacks) and visible from the beach, coastal waters, Vista Del Mar Avenue, and other areas accessible by the public shall be screened using panels, wire mesh, louvers or other forms of architectural screening. The screening shall be opaque or semi-transparent and have a non-glare finish, and the color shall be harmonious with the facility’s setting on a public beach. If the applicant proposes, and the CEC concurs, that it is impractical or infeasible to shield portions of the facility using architectural screening, the applicant may instead propose other measures such as landscaping, berms, or fencing to provide the necessary screening. Any such proposal must be based on the definition of feasibility in Coastal Act section 30108 and is subject to review and comment by the Executive Director of the Coastal Commission and review and approval by the CEC.
 - b) Landscaping: Where used to screen the facility, vegetation chosen shall be selected or maintained to provide year-round screening (e.g., evergreen species). Preference shall be given to native species and/or species requiring little or no irrigation.
 - c) Other structural screening: Where berms, fencing, or other structural elements are selected as the primary method to screen the facility, the structures shall harmonize with the facility’s setting on a public beach. If berms are used, they shall be vegetated and maintained with evergreen, native, and/or species requiring little or no irrigation. If fencing is used, it shall include a non-glare finish or be painted in a neutral color.
 - d) Necessary submittals: The Facility Visual Enhancement Plan shall include photographs showing existing conditions and simulated post-construction conditions from Key Observation Points (KOPs) around the facility (these may be the same KOPs that were used to develop the CEC Staff Assessment). The plan shall also include anticipated costs for completing and maintaining the various visual enhancement measures and a detailed schedule for completing construction of these components.

- 2) Seawall Design Plan¹: Before starting construction, the applicant shall complete a plan of the seawall design for review and comment by the Executive Director of the Coastal and for CEC review and approval. This plan shall include:
- a) Final design: The seawall along the west side of the facility shall be textured and finished in a neutral color harmonious with its location adjacent to a public bike path and beach. If painted, graffiti-resistant paint shall be used.
 - b) Landscaping: Where used to enhance the seawall design, vegetation chosen shall be selected or maintained to provide year-round screening (e.g., evergreen species). Preference shall be given to native species and/or species requiring little or no irrigation.
 - c) Necessary submittals: This seawall design plan shall include photographs showing the existing conditions and simulated post-construction conditions from observation points along the bike path adjacent to the seawall, from the beach, and from other points where the seawall is highly visible. The plan shall also include anticipated costs for completing and maintaining the seawall and a schedule for construction.

We also strongly recommend that the CEC provide opportunities for local residents, beach users, and other interested parties review and comment on the plans.

With these changes, the Coastal Commission believes the visual aspects of the proposed facility will be consistent with the policies of the Coastal Act.

Conclusion:

We recognize that the applicant or the CEC may at some point recommend additional visual enhancement measures or provide additional information regarding the feasibility of various proposed measures. We therefore reserve the right to review future submittals for conformity with the Coastal Act pursuant to our obligations under section 30413.

In closing, we greatly appreciate the efforts of the CEC to work closely with the Coastal Commission to ensure that the proposed project will be carried out in conformity with the Coastal Act. We look forward to continuing to work with you.

Sincerely,

SARA L. WAN
Chair
California Coastal Commission

¹ Please note that we will provide additional findings and recommended conditions later in the review process related to the proposed seawall's effect on beach erosion.

VISUAL RESOURCES APPENDIX B EL SEGUNDO HRSG EXHAUST VISIBLE PLUME ANALYSIS

Testimony of William Walters

The following testimony provides an assessment of the El Segundo Power Redevelopment Project (ESPR) heat recovery steam generator (HRSG) exhaust stack visible plume modeling analyses conducted by the Applicant. Staff conducted a separate modeling analysis for comparison.

HRSG PLUME ANALYSIS

The Applicant's Data Request Responses #110 and 111 (ESPR 2000u) were evaluated and an independent psychrometric analysis and dispersion modeling analysis was performed to determine the validity of the Applicant's response. The Combustion Stack Visible Plume (CSVP) model was used to estimate the potential plume frequency, and provide data on predicted plume length, width, and height. This project has two separate HRSG stacks, and the plume data presented below represents plume frequencies and dimensions for each stack individually. Some minor plume interaction may occur, but it would be limited due to the separation of the stacks.

HRSG PARAMETERS

The Applicant modeled three turbine operating conditions (100% load w/duct firing and power augmentation; 100% load w/o duct firing and power augmentation; and 50% load, w/o duct firing and power augmentation) for an entire year each. The Applicant stated in the response to Data Request #110 that these conditions represent the range of worst case operating conditions for the proposed plant. The AFC did not provide enough data to confirm the Applicant's contention that the conditions modeled were in fact conservative for use under all potential operating conditions; therefore, staff asked the Applicant if a 100% load w/power augmentation and no duct firing operating condition could occur. The Applicant identified that this operating condition was possible and identified the exhaust conditions for this operating scenario; however, they also noted that this operating condition was unlikely to occur on a regular basis. Table 1 provides exhaust parameters for the identified operating conditions.

Table 1 - HRSG Exhaust Parameters Provided by the Applicant

Parameter	HRSG Exhaust Parameters			
	100% Load, Duct Firing & Power Augmentation	100% Load, no Duct Firing, no Power Augmentation	50% Load, no Duct Firing, no Power Augmentation	100% Load, Power Augmentation, no Duct Firing ^b
Stack Height	65.5 meters	65.5 meters	65.5 meters	65.5 meters
Stack Diameter	5.8 meters	5.8 meters	5.8 meters	5.8 meters
Exhaust Temperature	442.39°K	368.56°K	352.78°K	365°K
Exit Velocity (calculated)	24.04 m/s	19.90 m/s	12.08 m/s	21.56 m/s
Exhaust mass flow rate	3,819,342 lbs/hr	3,895,776 lbs/hr	2,462,156 lbs/hr	4,168,727 lbs/hr
Moisture Content (% by vol.)	15.53%	8.00% to 9.01% ^a	7.79% to 8.55% ^a	12.0% to 14.26% ^a

^a - Values are interpolated based on the ambient temperature.

^b - Determined through e-mail and telephone contact with Gary Rubinstein of Sierra Research, May 2001.

The Applicant, subsequent to the filing of the original plume analysis, revised the Unit 5 and 7 stack height from 250 feet (76.2 meters) to 215 feet (65.5 meters). This modification to the stack height will not effect the plume frequency predicted by the CSVP model. The lowering of the stack height will lower the predicted plume height by an equivalent amount (i.e. 35 feet/11 meters). The plume height values provided in Table 8, staff's modeling results, have been adjusted to account for the lower stack height.

METEOROLOGICAL DATA SUMMARY

The Applicant provided one year of meteorological data, which was a combination of the SCAQMD Lennox 1981 data set and 1981 relative humidity data from the LAX meteorological station. This data set did not include weather phenomena data (i.e. occurrence of fog, rain, etc.).

APPLICANT DATA REQUEST RESPONSES SUMMARY

The Applicant modeled the first three HRSG stack conditions provided above with a modified version of the ISCST3 model and three other modules (CLAUSIUS, DISTANCE, AND COUNT) as explained in Data Request Response #110. The following is a summary of their results:

**Table 2- Applicant Predicted HRSG Steam Plume Frequency Summary
1981 Lennox/LAX Meteorological Data**

	Full Load w/Duct Burner and Power Augmentation		Full Load w/o Duct Burner and Power Augmentation		50% Load w/o Duct Burner and Power Augmentation	
	Hours	Frequency	Hours	Frequency	Hours	Frequency
Day	2	0.05%	1	0.02%	4	0.09%
Night	3	0.07%	2	0.05%	15	0.34%
Total	5	0.06%	3	0.03%	19	0.22%

It can be seen that the Applicant's modeling results indicate that plumes will occur very rarely. It should also be noted that the meteorological file provided by the applicant did not indicate fog, rain or other hours with impaired visibility conditions.

The Applicants predicted plume size characteristics are as follows:

TABLE 3 - APPLICANT PREDICTED DAYLIGHT HRSG STEAM PLUME DIMENSIONS (METERS)

	100% Load, Duct Firing & Power Augmentation	100% Load, w/o Duct Firing & Power Augmentation	50% Load, w/o Duct Firing & Power Augmentation
Plume Length	No data	No data	No data
Plume Height			
Maximum	a	a	162
Average ^b	a	a	8
Plume Width (diameter)			
Maximum	41-83 ^c	41-83 ^c	53
Average ^b	24-35 ^c	24-35 ^c	3

^a - Theoretical unlimited plume height.

^b - The average values reflect the average dimensions when plumes occur.

^c - Range of nominal values for a similar project.

STAFF CSVP MODELING ASSESSMENT

Initially, the conditions that the Applicant used for modeling the HRSG exhaust were reviewed. The 1981 Lennox/LAX meteorological data set provided by the Applicant was used to model the HRSG plume potential using the CSVP model. The plume frequency results were determined as follows:

**Table 4- Staff Predicted HRSG Steam Plume Frequency Summary
1981 Lennox/LAX Meteorological Data**

	Full Load w/Duct Burner and Power Augmentation		Full Load w/o Duct Burner and Power Augmentation		50% Load w/o Duct Burner and Power Augmentation		Full Load w/o Duct Burner, w/Power Augmentation	
	Hours	Frequency	Hours	Frequency	Hours	Frequency	Hours	Frequency
Day	1	0.02%	0	0%	2	0.05%	120	2.70%
Night	2	0.05%	0	0%	7	0.16%	644	14.91%
Total	3	0.03%	0	0%	9	0.10%	744	8.49%

Staff's plume frequency results are slightly lower than the Applicant's results for the three cases they modeled and agree with the overall finding that there will be a very low frequency of plume formation considering the exhaust conditions and meteorological conditions modeled. The potential visible plume frequency when operating at full load with power augmentation is much higher than the other three cases modeled, and can be considered the worst case operating condition for visible plume formation.

Staff obtained a six year (1990 to 1995) met data set for LAX from the National Climatic Data Center (NCDC), which was formatted for use with CSVP. This multi-year data set is believed to provide more representative results. Additionally, this met data set included weather phenomena data (i.e. rain and fog). Using this met data the following plume frequencies were determined:

**Table 5- Staff Predicted HRSG Steam Plume Frequency Summary
1990-1995 LAX Meteorological Data¹**

	Full Load w/Duct Burner and Power Augmentation		Full Load w/o Duct Burner and Power Augmentation		50% Load w/o Duct Burner and Power Augmentation		Full Load w/o Duct Burner, w/Power Augmentation	
	Hours	Frequency	Hours	Frequency	Hours	Frequency	Hours	Frequency
Day	19	0.07%	2	0.01%	40	0.15%	1, 2 9 9	4.87%
Day nf/nr	2	0.01%	0	0%	2	0.01%	4 1 8	1.74%
Night	97	0.37%	14	0.05%	202	0.78%	6, 3 4 0	24.45 %
Total	116	0.22%	16	0.03%	242	0.46%	7,639	14.53 %

¹ - Summary of all six years plume frequencies (52,577 total hours).
nf/nr – no fog no rain hours

Staff's predicted plume frequencies using the 1990-1995 LAX met data are marginally higher than those obtained from using the 1981 Lennox/LAX met data set provided by the Applicant. However, the plume frequencies predicted are still very low. The plume frequencies predicted for the full load case with power augmentation and without duct firing are significantly higher than the other cases; therefore, a seasonal frequency analysis was also performed for plumes during daylight no fog no rain conditions.

The results of the seasonal frequency analysis are as follows:

**Table 6 - Staff Predicted Worst-Case HRSG Steam Plume Seasonal Frequency
Full Load w/o Duct Burner, w/Power Augmentation
1990-1995 LAX Meteorological Data¹**

Year		Spring	Summer	Fall	Winter	Annual
1990	Hours	15	0	5	72	92
	Frequency	1.28%	0.00%	0.55%	8.14%	2.21%
1991	Hours	34	0	2	41	77
	Frequency	2.88%	0.00%	0.24%	4.81%	1.94%
1992	Hours	2	0	4	38	44
	Frequency	0.17%	0.00%	0.45%	4.45%	1.09%
1993	Hours	11	1	9	43	64
	Frequency	0.94%	0.09%	1.00%	5.24%	1.58%
1994	Hours	22	0	14	24	60
	Frequency	1.99%	0.00%	1.52%	2.66%	1.46%
1995	Hours	37	2	5	37	81
	Frequency	3.36%	0.18%	0.64%	4.93%	2.18%
Average	Hours	20	1	7	43	70
	Frequency	1.75%	0.04%	0.74%	5.04%	1.74%

¹ - Frequencies based on the seasonal daylight no fog no rain hours.

These results show that even when modeling the most conservative operating condition the plume occurrence frequency for daylight no fog no rain hours is predicted to be less than 10% seasonally.

The ambient conditions that occur during predicted plume events are characterized by cool ambient temperatures with high relative humidities.

The range of ambient conditions where HRSG plumes are predicted are given as follows:

Table 7 - Ambient Conditions During Hours with Predicted HRSG Plumes LAX Meteorological Data 1990 - 1995

ALL HOURS	Temperature	Relative Humidity
Full Load w/Duct Burner and Power Augmentation		
MAXIMUM	49.7°F	100%
Minimum	39.6°F	86%
Average	47.8°F	99%
Median	48.6°F	100%
Full Load w/o Duct Burner and Power Augmentation		
MAXIMUM	46.7°F	100%
Minimum	43.8°F	100%
Average	46.0°F	100%
Median	46.2°F	100%
50% Load w/o Duct Burner and Power Augmentation		
MAXIMUM	51.7°F	100%
Minimum	39.6°F	83%
Average	49.0°F	99%
Median	49.7°F	100%
Full Load w/o Duct Burner, w/Power Augmentation		
MAXIMUM	66.6°F	100%
Minimum	34.8°F	16%
Average	54.1°F	90%
Median	54.8°F	93%

Plume frequencies during clear daytime hours are the most important issue when determining potential significance. The temperature and relative humidity conditions necessary to cause visible plume formation under the four operating cases modeled are very infrequent, particularly during the daytime.

The CSVP predicted plume size characteristics for daylight no fog no rain hours are as follows:

**Table 8 - Staff Predicted HRSG Steam Plume Dimensions (meters)
Daylight No Fog No Rain Hours**

Daylight No Rain No Fog Hours	Length	Height	Width
Full Load w/Duct Burner and Power Augmentation			
Maximum	240	161	31
Average	223	142	29
Full Load w/o Duct Burner and Power Augmentation			
Maximum	*	*	*
Average	*	*	*
50% Load w/o Duct Burner and Power Augmentation			
Maximum	131	100	18
Average	121	92	16
Full Load w/o Duct Burner, w/Power Augmentation			
Maximum	465	648	57
Average	166	139	25

* - model results do not show plumes forming during daylight no fog no rain hours for this exhaust condition.

EXISTING CONDITIONS

Currently, El Segundo Units 3 and 4 operate with the following estimated exhaust conditions:

**Table 9 – Unit 3 and 4 Stack Exhaust Parameters
Provided by the Applicant**

PARAMETER	EXHAUST PARAMETER VALUES
Stack Height	65.55 meters
Stack Diameter	6.452 meters
Exhaust Temperature	390.78°K
Exit Velocity (calculated)	15.39 m/s
Exhaust mass flow rate	3,071,202 lbs/hr
Moisture Content (% by volume)	15.55%

The Applicant did not provide Unit 1 and 2 exhaust parameters in response to staff's Data Request. However, the Unit 3 and 4 Stack Exhaust parameters, that were provided by the Applicant, are considered to be similar to the Unit 1 and 2 Stack Exhaust Parameters, and are being used as a surrogate for this analysis. However, the Unit 1 and 2 plume dimensions would likely be predicted to be somewhat smaller than those from Unit 3 and 4 since they have a smaller power production/fuel use capability.

Using the LAX 1990 to 1995 met data the following plume frequencies were determined for Units 3 and 4:

**Table 10 - Staff Predicted Unit 3 and 4 Steam Plume Frequency Summary
1990-1995 LAX Meteorological Data¹**

	Unit 3 and 4 Stack	
	Hours	Frequency
Day	786	2.95%
Day nf/nr	194	0.81%
Night	4107	15.84%
Total	4893	9.31%

¹ - Summary of all six years plume frequencies (52,577 total hours).
nf/nr – no fog no rain hours

The CSVP predicted plume size characteristics for daylight no fog no rain hours are as follows:

**Table 11 - Staff Predicted Unit 3 and 4 Stack Steam Plume Dimensions
(meters)
Daylight No Fog No Rain Hours**

	Length	Height	Width
Maximum	433	609	57
Average	169	156	25

The modeling results show that the plumes from the existing Unit 3 and 4 stack are significantly more frequent and somewhat larger than the predicted plumes from the ESM project Unit 5 and 7 HRSG stacks under most operating conditions.

When operating with power augmentation on and the duct burners off, the Unit 5 and 7 plume frequencies are predicted to be higher than the Unit 3 and 4 frequencies. However, the Applicant has stated that this operating case is not expected to occur frequently. Therefore, as noted above, under most operating conditions that would occur the majority of the time, the plume frequencies for Units 5 and 7 are forecast to be below those forecast for Units 3 and 4. Therefore, since the plume frequencies for Units 1 and 2 are considered to be similar to those for Units 3 and 4, the replacement of Units 1 and 2 with new Units 5 and 7 will likely reduce the existing visible plume impacts from the plant.

CONCLUSIONS AND RECOMMENDATIONS

Visible plumes from the HRSG exhausts will occur from the ESPR during periods of cold and wet weather. The actual frequency of occurrence is weather dependent and will vary from year to year. The results of the plume modeling are dependent on both the exhaust condition inputs and the meteorological data. If the exhaust conditions modeled do not properly reflect the most conservative exhaust temperature and moisture conditions then the plume frequencies may be underestimated. The results of the staff CSVP modeling analysis show slightly less frequent plumes than the applicant. This difference in part may be differences in the modeling programs used and in part may be due to slightly different mathematical representations of the saturation curve.

The plume modeling results indicate that visible plumes from the Unit 5 and 7 HRSG stacks will not cause a significant visual impact.

WASTE MANAGEMENT

Testimony of Alvin Greenberg, Ph.D.

INTRODUCTION

This staff assessment presents an analysis of the issues associated with managing wastes generated from constructing and operating the proposed El Segundo Power Redevelopment Project (ESPR 2000a). It evaluates the proposed waste management plans and mitigation measures designed to reduce the risks and environmental impacts associated with handling, storing, and disposing of project-related hazardous and nonhazardous wastes. The technical scope of this analysis encompasses wastes generated during facility construction (including demolition of existing structures) and operation, except wastewater discharged pursuant to National Pollutant Discharge Elimination System (NPDES) permits. Wastewater is discussed in the **Soil and Water Resources** section of this document.

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

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

LAWS, ORDINANCES, REGULATIONS AND STANDARDS

FEDERAL

Resource Conservation and Recovery Act (42 U.S.C. § 6922)

RCRA establishes requirements for the management of hazardous wastes from the time of generation to the point of ultimate treatment or disposal. Section 6922 requires generators of hazardous waste to comply with requirements regarding:

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

Title 40, Code of Federal Regulations, part 260

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

STATE

California Health and Safety Code §25100 et seq. (Hazardous Waste Control Act of 1972, as amended).

This act creates the framework under which hazardous wastes must be managed in California. It mandates the State Department of Health Services (now the Department of Toxic Substances Control (DTSC) under the California Environmental Protection Agency, or Cal EPA) to develop and publish a list of hazardous and extremely hazardous wastes, and to develop and adopt criteria and guidelines for the identification of such wastes. It also requires hazardous waste generators to file notification statements with Cal EPA and creates a manifest system to be used when transporting such wastes.

Title 14, California Code of Regulations, §17200 et seq. (Minimum Standards for Solid Waste Handling and Disposal)

These regulations set forth minimum standards for solid waste handling and disposal, guidelines to ensure conformance of solid waste facilities with county solid waste management plans, as well as enforcement and administration provisions.

Title 22, California Code of Regulations, §66262.10 et seq. (Generator Standards)

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

LOCAL

Hazardous waste is regulated locally by the City of El Segundo in its 1992 General Plan. El Segundo Municipal Code, Title 6 Chapter 6.22 regulates petroleum underground storage tank cleanup. The Certified Unified Program Agency for hazardous wastes at the ESPR Project is the El Segundo Fire Department and has authority to administer the state and local programs.

The Los Angeles County Wastewater Treatment plant in Carson issues permits for sanitary discharges.

SETTING

PROJECT AND SITE DESCRIPTION

EL Segundo Power II LLC (ESP II), is seeking approval to replace the existing El Segundo Generating Station (ESGS) Units 1 and 2 natural gas-fired, combined cycle electric generation facility. ESGS Units 3 and 4 located adjacent to Units 1 and 2 will

not be modified by this project. The new facility is expected to generate 630 megawatts (MW) under nominal conditions. This is 280 MW more than the old Units 1 and 2 were capable of generating when operating. The project includes demolition and removal of the existing Units 1 and 2 and replacement with Units 5, 6, and 7 in the location previously occupied by Units 1 and 2.

The ESPR site is located at 301 Vista Del Mar in the City of El Segundo. The site is bordered by Vista Del Mar and the Chevron Refinery to the east, 45th St., in the City of Manhattan Beach on the south, Santa Monica Bay on the west, and the Chevron Marine Terminal to the north. The site is 33 acres and an existing tank farm comprises approximately 9 of those acres.

Sanitary wastes will be collected and transferred via a new sewer connection to the City of Manhattan Beach Public Works Department, in accordance with the city's discharge requirements. Facility process wastewater will be sent to the existing retention pond on facility property and discharged to Santa Monica Bay in accordance with the current National Pollutant Discharge Elimination System (NPDES) permit.

A Phase I Environmental Site Assessment (ESA) was prepared in 1997 (CH2M Hill 1997). The purpose of the ESA was to determine the potential for the presence or likely presence of any hazardous substances or petroleum products under conditions that may indicate a release or threat of a release from present or past activities. The Phase I ESA identified a number of environmental conditions at the site (summarized in ESPR 2000a, AFC section 5.14.1.1) including:

- Total petroleum hydrocarbons (TPH) and volatile organic compounds (VOCs) have been detected in soils and groundwater beneath the ESGS. Cleanup is currently being conducted pursuant to Chevron's Cleanup and Abatement Order issued by the Los Angeles Regional Water Quality Control Board (LARWQCB).
- TPH, VOCs, and metals were found in groundwater beneath the retention basins. Southern California Edison conducts quarterly monitoring pursuant to a Consent Order with DTSC.
- TPH was detected in soil and groundwater under tank farm.
- Oil staining was found around the transformers adjacent to Units 1 through 4.
- VOCs were detected in soil and groundwater near the hazardous waste storage area.

The Phase I ESA provided the basis for additional sampling and analysis of soil and groundwater performed as part of several Phase II ESAs and other site assessments to further define the extent of existing contamination. The results of these investigations and a new investigation are summarized in a 1998 report (Woodward-Clyde 1998). This report identified remediation issues for several identified localized areas at the ESGS. The contaminants identified include TPH, VOCs, semivolatile organic compounds (SVOCs), metals, and in soil and groundwater. TPH-impacted soils were

found in four areas at the ESGS, VOC-impacted soil in two areas, and metal-impacted soil at five areas. TPH was found in groundwater at five areas, VOCs throughout the ESGS (particularly benzene in five areas), SVOCs in nine areas, and metals were generally found in groundwater throughout the site.

Additionally, metals and VOCs have been found beneath the retention basin (originally one basin when constructed but divided in two by a concrete wall several years ago) located to the south of the site and north of the above-ground fuel oil tanks to be demolished. Information on this contamination was provided by Southern California Edison to DTSC. Edison is the responsible party and will address the contamination as per DTSC guidance (DTSC 2002). The applicant has taken the position that this basin is not part of the project yet has been used by the existing power plant in the past, is currently used by the existing power plant, and will be used by the new ESPR when completed.

Staff has reviewed the Phase I and II ESAs and has concerns about the lack of remedial investigations conducted beneath existing structures which are to be demolished. Angle borings beneath these structures were not obtained and thus investigations will not occur until the structures are removed. Staff has proposed a condition of certification (**WASTE-6**) which would require the applicant to prepare a Remedial Investigation Workplan (RI Workplan) prior to demolition. This plan would include a detailed site characterization plan with soil and groundwater sampling and analysis to determine the extent and nature of contamination existing beneath these structures. The RI Workplan would be provided to the Los Angeles County Fire Department, the California Department of Toxic Substances Control (DTSC), the LARWQCB, the City of El Segundo Fire department, and to the CEC CPM for review and approval. If contaminated soil or groundwater is found to exist, the project owner would contact representatives of the above-named agencies for further guidance and possible oversight. The applicant has indicated that it will provide this workplan (ESPR 2000y).

Southern California Edison has made a request for designation of an administering agency to oversee site investigation and remedial action, pursuant to California Health and Safety Code section 25260 et seq. The LARWQCB is the lead agency for the project site remediation and DTSC is the lead agency for addressing the contamination found beneath the retention basin.

IMPACTS

PROJECT SPECIFIC IMPACTS

Construction and Demolition

Demolition, site preparation, and construction of the generating plant and associated facilities will generate both nonhazardous and hazardous wastes. Individual contractors are considered to be the generators of construction wastes, and as part of its contract specifications for construction contractors, the ESPR will require that materials be handled and disposed in accordance with applicable LORS. AFC Tables 5.14-4 and 3.4-6 (ESPR 2000a) provide descriptions of construction and demolition waste streams and management methods.

Site preparation will also include dewatering of the soil after removal of the foundations of existing Units 1 and 2. Groundwater levels will be lowered as much as 14 feet below average levels. Because TPH and VOCs have been detected in groundwater, treatment to meet the waste discharge requirements of the LARWQCB will be required prior to discharge to Santa Monica Bay. A pump test will be performed according to a test protocol developed by the applicant to ensure adequate treatment and flow rates (ESPR 2000y).

Nonhazardous waste streams from construction include paper, scrap wood, glass, metal, plastics, concrete, asphalt, oil absorbent mats, and oily rags (ESPR 2000a, AFC Table 5.14-4). The applicant estimates that about 20-40 cubic yards of these types of wastes will be generated on a weekly basis plus about 1000 sq. feet of oily mats and three to four 55-gallon drums of oily rags per month during the construction period. Most, if not all, of these wastes would be sent to a waste disposal facility.

Demolition, dewatering, and construction are expected to generate both solid and liquid hazardous wastes (ESPR 2000a, AFC Tables 5.14-2, 5.14-3, and 5.14-4). Hazardous wastes associated with Asbestos Containing Materials (ACM), lead-based paint, contaminated soil, and groundwater is expected. Much ACM has already been removed (about 60 percent of that identified as ACM) but the quantity of materials containing lead-based paint is unknown (ESPR 2000a, AFC p.5.14-8). Estimates of ACM and lead-based paint materials are provided in AFC Tables 5.14-2 and 5.14-3 and are as high as 163,000 sq. feet of materials. During demolition, as much as 40,000 cubic yards of soil will be excavated and managed. More may be encountered in other areas including soils beneath the footprints of Units 1 and 2 and other structures to be demolished. All excavated soil will be characterized and managed according to the Draft Waste Management Plan prepared as Appendix S to the AFC and Appendix N-3, Hazardous Materials and Hazardous Waste Management Plan. If soils are classified as hazardous wastes, the City of El Segundo Fire department and the Los Angeles County Hazardous Materials Division will be notified. The soil will be transported to a soil recycling facility or a Class I landfill. It is also estimated that dewatering will generate as much as 13 to 65 million gallons of contaminated groundwater for treatment and discharge according to the permit conditions of an NPDES permit.

AFC Table 5.14-4 also lists wastes typically generated during construction include waste oil and grease, paint, used batteries, spent solvent, welding materials, and start-up cleaning of the HRSG. The 200,000 gallons generated during this process can mostly be recycled. This table additionally lists the management methods of the wastes.

Operation

The proposed facility will generate both nonhazardous and hazardous wastes under normal operating conditions. These waste streams are identified in AFC Table 5.14-5.

Nonhazardous wastes generated during operation of Units 5, 6, and 7 are expected to be similar to those generated by the present facility and include trash, paper, wood, plastic, cardboard, broken and rusted metal and machine parts, defective electrical materials, empty containers, and other typical worker-generated solid wastes. The

quantities of nonhazardous wastes generated from gas-fired facilities are typically minor and operation of the new units is expected to generate the same amount as currently generated. Nonhazardous solid waste at the existing facility is routinely segregated according to recyclable content to minimize the quantity disposed offsite (ESPR 2000a, AFC p.5.14-20). This practice will continue for operation of the proposed ESPR.

Hazardous wastes likely to be generated during routine project operation include oily water, CTG washwater, heat recovery steam generator (HRSG) washwater, spent selective catalytic reduction (SCR) catalysts, and minimal amounts of used cleaning solvents. About 50 gallons per year (g/y) of oily water, 7200 g/y of CTG washwater, 50,000 gallons of HRSG washwater per cleaning (2 cleanings every 5 years), and 50 cubic meters of SCR catalyst (containing heavy metals such as vanadium) are expected to be generated on an annual basis from the new combined cycle units (ESPR 2000a, AFC Table 5.14-5).

Solid wastes will be disposed of at either Class I, II, or III landfills (depending on the waste type) while liquid wastes will be either discharged to municipal sewage treatment plants or transported to hazardous waste treatment or disposal facilities.

IMPACT ON EXISTING WASTE DISPOSAL FACILITIES

The AFC identifies three nonhazardous waste disposal facilities in the area (ESPR 2000a , AFC Table 5-14-1). They are located in Corona, Ca. (permitted disposal capacity of 4000 tons per day and is expected to remain operational until 2050), Simi Valley (4000 tons per day from 2020 to 2050), and Orange County (8500 tons per day through 2024). Even discounting the effects of recycling on the total amount of non-hazardous wastes destined for landfilling, the amounts of waste generated during project construction and operation are insignificant relative to existing disposal capacity.

Three Class I landfills in California, at Kettleman Hills in Kings County, Buttonwillow in Kern County, and Laidlaw in Imperial County, are permitted to accept hazardous waste. In total, there is in excess of 22 million cubic yards of remaining hazardous waste disposal capacity at these landfills, with remaining operating lifetimes up to the year 2078. The amount of hazardous waste transported to these landfills has decreased in recent years due to source reduction efforts by generators, and the transport of waste out of state that is hazardous under California law, but not federal law.

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

CUMULATIVE IMPACTS

Additional waste management impacts which could contribute to those from construction and operation of the ESPR project include those associated with the demolition of the existing fuel oil storage tanks with related environmental remediation, and installation of selective catalytic reduction (SCR) pollution control on the new units.

Demolition of fuel oil storage tanks is a separate phase due to the planned use of two tanks as construction areas. Wastes (including hazardous and nonhazardous) generated by such demolition could be significant. Much of this waste can be recycled or used on-site. Once the tanks are removed, soil or groundwater contamination may be present, and remediation may be required. Until the tanks are removed, the extent of potential contamination is unknown.

Installation of SCR pollution control will not result in any significant waste related impacts. Periodically, the catalysts must be replaced to maintain operating efficiency, and are typically recycled.

The quantities of wastes generated during construction and operation of the ESPR project will not result in any significant waste management related impacts. Quantities of wastes associated with the activities described above, including continued operation of units three and four, site preparation, demolition of existing units one and two, and installation of SCR catalyst, although significant, are mitigatable. However, considering the lack of impacts on individual disposal facilities and the availability of additional regional landfills and the efforts made to recycle, cumulative impacts will be insignificant for both hazardous and nonhazardous wastes.

FACILITY CLOSURE

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

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

An approved on-site contingency plan is also required to protect public health and safety in the case of unexpected permanent closure. As above, the plan must provide for the removal of hazardous materials and hazardous wastes, draining of all chemicals from storage tanks and other equipment, and the safe shutdown of all equipment.

For planned permanent closure, ESPR will develop a facility closure plan at least twelve months prior to commencement of closure and is committed to complying with LORS which are applicable at the time of closure.

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

Energy Commission staff concludes that the applicant will be able to comply with all applicable LORS regulating the management of hazardous and non-hazardous wastes during site preparation, demolition, construction and operation. The applicant is required to dispose of hazardous and non-hazardous wastes at facilities approved by the LARWQCB or the CAL EPA Department of Toxic Substances Control. Because hazardous wastes will be produced during project construction and operation, the applicant has indicated that it has an existing EPA identification number as a hazardous waste generator. The applicant also indicated that they will apply to Cal/EPA for a hazardous waste generator number and a treatment permit. Accordingly, ESPR will be required to properly store, package and label waste, use only approved transporters, prepare hazardous waste manifests, and keep detailed records. Pursuant to California Code of Regulations, Title 22, section 67100.1 et seq., a hazardous waste Source Reduction and Evaluation Review and Plan which meets the requirements of SB-14 will be required. Neither waste management plans found in the AFC (Appendixes N-3 or S) provide this plan.

MITIGATION

Based on the analysis of impacts and the design and operational features that have been incorporated into the project, the applicant has proposed mitigation measures beyond those already in place at the ESGS (AFC §5.14.4). The applicant will develop and submit waste management plans that will include details on the handling, packaging, labeling, storage, treatment, and disposal of wastes (proposed Condition of Certification **WASTE-3**). The applicant has also stipulated to four Conditions of Certification (**WASTE 1 through 4**).

In order to address concerns about the lack of remedial investigations conducted beneath existing structures which are to be demolished, staff has proposed a condition of certification (**WASTE-6**) which would require ESPR to prepare a Remedial Investigation Workplan prior to demolition. This plan would be provided to the LA County, El Segundo Fire Department, the California Department of Toxic Substances Control, the LA Regional Water Quality Control, and the CEC CPM for review and approval. If contaminated soil or groundwater are found to exist, the project owner would contact representatives of those agencies for further guidance and possible oversight. This proposed condition would also prohibit any site preparation or construction on soils containing hazardous wastes until the wastes are either remediated or otherwise found to pose an insignificant risk to humans and the environment as demonstrated to the satisfaction of the LARWQCB, DTSC, and the CPM.

Staff has examined the waste management related measures proposed by the Applicant and concluded that, together with applicable LORS and the additional measure proposed by staff, they will adequately assure that no significant environmental impacts will result from the management and disposal of project-related waste.

CONCLUSIONS AND RECOMMENDATIONS

Management of the wastes generated during site preparation, demolition, construction, and operation of ESPR will not result in any significant adverse impacts if ESPR implements the waste management measures proposed in the Application for Certification (00-AFC-14) and the proposed conditions of certification.

CONDITIONS OF CERTIFICATION

WASTE-1 The project owner and, if necessary, its construction contractor, shall each obtain a hazardous waste generator identification number from the Department of Toxic Substances Control prior to generating any hazardous waste.

Verification: The project owner shall notify the CPM via the monthly compliance report of its receipt and keep a copy of the identification number on file at the project site.

WASTE-2 Upon becoming aware of any impending waste management-related enforcement action by any local, state, or federal authority, the project owner shall notify the CPM of any such action taken or proposed to be taken against the project itself, or against any waste hauler or disposal facility or treatment operator with which the owner contracts.

Verification: The project owner shall notify the CPM in writing within 10 days of becoming aware of an impending enforcement action. The CPM shall notify the project owner of any changes that will be required in the manner in which project-related wastes are managed.

WASTE-3 Prior to the start of both site mobilization and project operation, the project owner shall prepare and submit to the LA County Department of Hazardous Materials for review and comment and to the CPM for review and approval, a waste management plan for all wastes generated during construction and operation of the facility, respectively. The plans shall contain, at a minimum, the following:

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

Verification: No less than 30 days prior to the start of site mobilization, the project owner shall submit the construction waste management plan to the (insert local agencies, if applicable) and the CPM. The operation waste management plan shall be submitted no less than 30 days prior to the start of project operation. The project owner shall submit any required revisions within 20 days of notification by the CPM (or mutually agreed upon date). In the Annual Compliance Reports, the project owner shall document the actual waste management methods used during the year compared to planned management methods.

WASTE-4 The project owner shall have a Registered Professional Engineer or Geologist, with experience in remedial investigation and feasibility studies, available for consultation during soil excavation and grading activities. The Registered Professional Engineer or Geologist shall be given full authority to oversee any earth moving activities that have the potential to disturb contaminated soil.

Verification: At least 30 days prior to the start of site mobilization, the project owner shall submit the qualifications and experience of the Registered Professional Engineer or Geologist to the CPM for approval.

WASTE-5 If potentially contaminated soil is unearthed during excavation at either the proposed site or linear facilities as evidenced by discoloration, odor, detection by handheld instruments, or other signs, the Registered Professional Engineer or Geologist shall inspect the site, determine the need for sampling to confirm the nature and extent of contamination, and file a written report to the project owner and CPM stating the recommended course of action. Depending on the nature and extent of contamination, the Registered Professional Engineer or Geologist shall have the authority to temporarily suspend construction activity at that location for the protection of workers or the public. If, in the opinion of the Registered Professional Engineer or Geologist, significant remediation may be required, the project owner shall contact representatives of the LA County Department of Hazardous Materials, the Los Angeles Regional Water Quality Control Board and the Glendale Regional Office of the California Department of Toxic Substances Control for guidance and possible oversight.

Verification: The project owner shall submit any reports filed by the Registered Professional Engineer or Geologist to the CPM within 5 days of their receipt. The project owner shall notify the CPM within 24 hours of any orders issued to halt construction.

WASTE-6 Before demolition of the fuel oil tanks, the existing generator buildings, and any other building, the project owner shall prepare a Remedial Investigation Workplan (RI Workplan). This plan shall include a detailed site characterization plan with soil and groundwater sampling and analysis to determine the extent and nature of contamination existing beneath these structures. The RI Workplan shall be provided to the Los Angeles County Fire Department, the Glendale Regional Office of the California Department of Toxic Substances Control, the Los Angeles Regional Water Quality Control, and the City of El Segundo Fire Department for review and comment, and to the CEC CPM for review and approval. If contaminated soil or groundwater is found to exist, the project owner shall contact representatives of the above-named agencies for further guidance and possible oversight. In no event shall the project owner proceed with site preparation or construction activities at any location on the site where hazardous waste contamination is found to be present until that location is either remediated or shown to pose an insignificant risk to humans and the environment as demonstrated to the satisfaction of the LARWQCB, DTSC, and the CPM.

Verification: At least sixty (60) days prior to commencement of tank or structure demolition, the project owner shall provide the RI Workplan to the Los Angeles County

Fire Department, the Glendale Regional Office of the California Department of Toxic Substances Control, the Los Angeles Regional Water Quality Control, and the CEC CPM. Within thirty (30) days of completion of the sampling and analysis and prior to the initiation of any construction activities, the project owner shall provide the results of the sampling and analysis to the Los Angeles County Fire Department, the Glendale Regional Office of the California Department of Toxic Substances Control, the Los Angeles Regional Water Quality Control, and the CPM for review and guidance on possible remediation.

WASTE-7 Before demolition of the fuel oil tanks, the existing generator buildings, and any other building, the project owner shall ensure that the entire site is surrounded by a berm or other solid structures capable of containing any runoff from the site and preventing this runoff from leaving the site. In no event shall the project owner proceed with site preparation or construction activities at any location on the site where hazardous waste contamination is found to be present until that location has such containment in place to the satisfaction of the CPM. At least thirty (30) days prior to commencement of site preparation activities, the project owner shall provide written plans on containment to the CPM for review and approval.

REFERENCES

CH2M Hill (1997). Phase I Environmental Site Assessment, ESGS.

DTSC 2002. Personal communication with Adela Weinstein, DTSC Southern California Region. January 16.

ESPR (El Segundo Power Station) 2000a – Application for Certification Submitted to the California Energy Commission on December 18, 2000.

ESPR (El Segundo Power Station) 2000e – Water Quality and Waste Management Information Submitted to California Energy Commission on December 21, 2000.

ESPR (El Segundo Power Station) – 2000r – Applicant’s Response to Staff’s Data Requests, Sets One and Two Submitted to the California Energy Commission on April 20, 2001.

ESPR (El Segundo Power Station) – 2000w – Spill Prevention Control and Countermeasure Plan, Emergency Preparedness and Emergency Response Plan, Hazardous Materials and Hazardous Waste Management Plan

ESPR (El Segundo Power Station) – 2000y – Response to CEC Data Requests, Set 5, May 18, 2001

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SOIL AND WATER RESOURCES

Testimony of Dominique Brocard, Joe Crea, Tim Landis,
and Rich Sapudar

INTRODUCTION

This section of the Final Staff Assessment (FSA) analyzes potential effects on soil and water resources by the El Segundo Power Redevelopment Project (ESPR), which would be located on the northern portion of the existing El Segundo Generating Station (ESGS) site within the City of El Segundo, Los Angeles County. The potential for the project to adversely affect surface and groundwater supplies, degrade ocean, inland surface and groundwater quality, and to induce erosion and sedimentation was evaluated. This assessment also addresses the project's ability to comply with all applicable federal, state and local laws, ordinances, regulations and standards (LORS). Where the potential for impacts is identified, staff proposes mitigation measures to reduce the significance of the impact and, as appropriate, recommends Conditions of Certification to ensure that any impacts are less than significant and the project complies with all applicable LORS.

Flooding and drainage issues are addressed in the **Facility Design** section of this document. Biological issues associated with cooling water intake and discharge are addressed in the **Biological Resources** section and aspects of sediment and soil contamination are addressed in the **Waste Management** section of this FSA. References to these sections are made in the appropriate discussions.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

FEDERAL

Clean Water Act

The Clean Water Act (33 USC § 1251), formerly the Federal Water Pollution Control Act of 1972, was enacted with the intent of restoring and maintaining the chemical, physical, and biological integrity of the waters of the United States.

The Clean Water Act requires states to set standards to protect, maintain, and restore water quality through the regulation of point source and certain non-point source discharges to surface water. These discharges are regulated by the National Pollutant Discharge Elimination System (NPDES). In California, NPDES permitting authority is delegated to, and administered by, the nine Regional Water Quality Control Boards. For the ESPR project, the local board is the Los Angeles Regional Water Quality Control Board (LARWQCB), Region 4.

STATE

California Constitution, Article 10, Section 2

This section requires that the water resources of the State be put to beneficial use to the fullest extent possible. The waste, unreasonable use, or unreasonable method of use of water is prohibited. The conservation of such waters is to be exercised with a view to the reasonable and beneficial use in the interest of the people and for the public welfare. This section is self-executing, and the Legislature may also enact laws in the furtherance of the policy contained in this section.

Porter - Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act of 1967, Water Code section 13000 et seq., requires the State Water Resources Control Board (SWRCB) and the nine RWQCBs to adopt water quality criteria to protect state waters. These criteria include the identification of beneficial uses, narrative and numerical water quality standards and implementation procedures. The criteria for the project area are contained in the *Basin Water Quality Control Plan – Los Angeles Region – Basin Plan for Coastal Watersheds of Los Angeles and Ventura Counties*. This plan sets numerical and/or narrative water quality standards controlling the discharge of wastes to the State's waters and land. These standards are applied to the proposed project through the Waste Discharge Requirements (WDRs) by the RWQCB.

California Water Code

Water Code section 461 encourages the reuse of wastewaters. The administering agency is the SWRCB.

Water Code sections 8571, 8608, and Title 22, California Code of Regulations (CCR), chapter 4 sets water standards and treatment criteria for water recycling. This includes bacteriological water quality. Disinfected tertiary treatment is required for waters that have potential for contact with the public.

Water Code section 13550 requires the use of reclaimed water where available. The availability of recycled water is based upon a number of criteria, which include provisions that the quality and quantity of the reclaimed water are suitable for the use, the cost is reasonable, the use is not detrimental to public health, and will not impact downstream users or biological resources.

California Thermal Plan

In 1972, the State Water Resources Control Board adopted the "Water Quality Control Plan for the Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries of California," more commonly known as the Thermal Plan. The Thermal Plan, which was later amended in 1975, sets limits on the discharge of wastewaters with elevated temperatures into coastal, estuarine and interstate waters in order to meet water quality objectives. A major aim of the Thermal Plan is to protect marine resources in the ocean and enclosed bays and estuaries from the adverse impacts of thermal waste.

Thermal waste is defined as cooling water and industrial process water used to carry waste heat from such large point sources as power plants. Two categories of

discharges exist: “existing,” which are discharges in place or under construction prior to the plan’s 1972 development, and “new,” which are discharges developed after the plan was adopted. The project as proposed would discharge to Santa Monica Bay using the existing El Segundo Generating Station discharge channel. The following water quality objectives of the Thermal Plan are applicable to the ESGS.

- Elevated temperature wastes shall comply with limitations necessary to assure protection of the beneficial uses and areas of special biological significance.
- The Thermal Plan provides the authority for the RWQCB to grant exceptions to the specific water quality objectives in accordance with Section 316(a) of the Clean Water Act. Such exceptions require the approval of the SWRCB.

California Ocean Plan

In 1997, the SWRCB (Resolution 97-026) adopted the latest version of the Water Quality Control Plan for Ocean Waters of California (California Ocean Plan). The California Ocean Plan establishes beneficial uses and water quality objectives for the state’s ocean waters outside of enclosed bays, estuaries and lagoons. The plan also sets forth effluent limitations, management practices and prohibitions. Every three years the plan is reviewed and, if necessary, updated.

Enclosed Bays and Estuaries

The principal policy of the State Board, which addresses enclosed bays and estuaries, is the “Water Quality Control Policy for the Enclosed Bays and Estuaries of California” (adopted by the Board on May 16, 1974 by Resolution 74-43). This policy contains a number of prohibitions on waste discharges including chemical, biological and petroleum related waste.

Spills, Leaks, Investigation & Cleanup

The Spills, Leaks, Investigation & Cleanup (SLIC) Program involves investigation and corrective action at sites not regulated by the Underground Tank Program and the Well Investigation Program. The Regional Board oversees site investigation and cleanup after determining that an unauthorized discharge is polluting or has potential to pollute regional waterbodies. Guidelines for this program are defined in State Board Resolution No. 92-49 entitled *Policies and Procedures for Investigation and Cleanup and Abatement of Discharges Under Water Code Section 13304*.

California Coastal Act of 1976

The Coastal Resources Planning and Management Policies of the California Coastal Act require that the “...biological productivity and the quality of coastal waters, wetlands, estuaries and lakes shall be maintained by minimizing adverse effects of wastewater discharges and entrainment, controlling runoff, preventing depletion of groundwater...” (Pub. Resources Code, § 30231).

Department of Toxic Substances Control

The Department of Toxic Substances Control (DTSC), under the authority of the federal Resource Conservation and Recovery Act, must approve remediation at the ESGS/ESPR site before any site closure or clearance. Workplans and reports regarding site remediation must be submitted to DTSC, Southern California Permitting

Branch, 1011 North Grandview Avenue, Glendale, California 91201 in addition to other agencies overseeing the project.

state policies

State Water Resources Control Board Policy 75-58

The SWRCB has adopted a number of policies that provide guidelines for water quality protection. The principal policy of the State Board that addresses the specific siting of energy facilities is the "Water Quality Control Policy on the Use and Disposal of Inland Waters Used for Power Plant Cooling" (adopted by the Board on June 19, 1976 by Resolution 75-58). This policy specifically discourages the use of fresh inland waters for power plant cooling and gives priority to other than fresh water sources of water for this purpose. This SWRCB policy recommends that power plant cooling water should, in order of priority, come from wastewater being discharged to the ocean, ocean water, brackish water from natural sources or irrigation return flow, inland wastewaters of low total dissolved solids, and other inland waters. This policy also defines cooling water discharge prohibitions.

LOCAL

Los Angeles County Department of Public Works

The Hydrology Manual establishes the LA County Department of Public Works' hydrologic design procedures and standards. The manual serves as a guide to establish steps involved in converting precipitation to runoff in accordance with Public Works standards. The techniques contained within the manual are applicable to design and evaluation of hydrologic facilities. Since the City of El Segundo does not contain design procedures and standards that govern stormwater, the ESGS must comply with provisions required by the LA County Department of Public Works Hydrology Manual.

El Segundo Ordinance 1329 (Chapter 6.28) – Standard Urban Stormwater Mitigation Plan Implementation

Ordinance 1329 of the City of El Segundo Stormwater and Urban Runoff Pollution Control serves as a model to address stormwater pollution from new development and redevelopment projects. All persons engaging in earthmoving activities are required to demonstrate proof of compliance regarding stormwater discharge requirements mandated by the LARWQCB.

Chapter 6.28 of this ordinance ensures that Best Management Practices (BMPs) are implemented to reduce pollution from stormwater runoff during pre- and post-construction activities. The purpose of Chapter 6.28 is to enhance and protect the water quality of the Santa Monica Bay and receiving watercourses of the U.S. through the prohibition of non-stormwater discharges into storm sewers and the reduction of pollutant loads in stormwater and urban runoff to the maximum extent practicable.

City of El Segundo Work in Public Street Permit

A permit for the installation of water lines and for construction in the public street right-of-ways is required from the Public Works Department via the Engineering Division. The applicant must submit plans that are designed by a Professional Engineer.

City of Manhattan Beach Street Excavation Permit

A portion of the sanitary sewer line would connect to an existing sewer line within the City of Manhattan Beach. Therefore, the applicant must obtain a Street Excavation Permit. Permit provisions require the submittal of pipeline plans, including pipeline location(s) and flow estimates, to the Community Development Department. The applicant must comply with the City of Manhattan Beach Standard Urban Storm Water Mitigation Plan (SUSMP) requirements, which are identical to those of the City of El Segundo.

ENVIRONMENTAL SETTING

REGIONAL SETTING

The El Segundo Power Redevelopment Project (ESPR) would be located on the northern portion of the existing El Segundo Generating Station (ESGS) site within the City of El Segundo, Los Angeles County. The surrounding areas to the north, east and south are urbanized and developed. The Santa Monica shoreline and bay, which are part of the Pacific Coast, border the project immediately to the west. The City of Manhattan Beach shoreline lies to the immediate south of the ESPR site. All adjacent properties are zoned for Heavy Industrial Use with the exception of beach and residential properties located in the City of Manhattan Beach.

The Palos Verdes Peninsula and Santa Monica Mountains are located south and north of the project, respectively. The project is located in the western portion of the Los Angeles Structural Basin. This geographic feature is the transition zone between the southern and northern portions of the Transverse Ranges Physiographic Provinces.

Mild winters and dry summers characterize the Mediterranean climate of the Los Angeles area. The average daily temperatures range from 56°F in January to 73°F in August. The annual rainfall average as measured at the Los Angeles Airport is 12.01 inches, but can be highly variable depending on regional effects such as El Nino ocean current. Precipitation events equal to or greater than 1-inch occur at an annual average of 3 days per year. Most of the precipitation occurs between October and April. The summer months are relatively dry with precipitation occurring at less than 0.35 inches (ESPR 2000a).

LOCAL SETTING AND PROJECT DESCRIPTION

Existing Power Plant

The ESPR project would be located on the northern portion of the existing ESGS site within the City of El Segundo, Los Angeles County. The site is approximately 33 acres in size. The existing ESGS is a nominally rated 350 MW facility currently composed of four (Units 1 – 4) gas-fired conventional, electric power generating units. The technology used at the existing plant produces high-pressure steam in a boiler fueled by natural gas that directs that steam to a steam turbine generator that produces electricity (ESPR 2000a).

Units 1 and 2 are the existing power blocks that are proposed for demolition and replacement. The total disturbance for the power block would be approximately 5.5 acres. Units 3 and 4, located adjacent to Units 1 and 2, would continue to operate using their existing facilities. The applicant is proposing to replace Units 1 and 2 with state-of-the-art combined cycle units (Units 5, 6 and 7) that would increase the new station net power output by approximately 280 MW (ESPR 2000a).

A former Southern California Edison (SCE) tank farm occupies approximately 9.0 acres of the southern end of the ESGS site. The tank farm is flat and surrounded by an asphalt berm. El Segundo Power II LLC (ESPII), the project proponent, has purchased this parcel from SCE. The farm consists of two large tanks that are used to store fuel oil and one smaller displacement tank (ESPR 2000a). A four phase Tank Farm Plan, involving the two larger tanks, and a proposed southern berm for visual purposes has been proposed by ESPII to accommodate the ESPR project as a laydown/staging area during construction. The two larger tanks are currently empty. The smaller displacement tank will remain in place and functional (ESPR 2000aa). A berm for visual screening would be located along the southern boundary of the Tank Farm and would parallel 45th Street in an east-westward direction (ESPR 2002ee).

Surface Water Hydrology

Stormwater

The project area encompasses approximately 33 acres. Existing stormwater runoff and floor drain wastes drain to a system of catch basins (inlets) via a closed pipe system. The flow is routed to oil/water separators before combining with the cooling water and treated sanitary wastes that discharge to the Santa Monica Bay through Outfall Nos. 001 and 002. The off-site storm water flows are from upslope street drainage only. This system was observed by staff during a site visit on March 28, 2001. All off-site drainage is routed via a closed pipe and concrete swale system around the outer perimeter of the tank farm and through a 24" corrugated metal pipe (CMP) at the southwest corner of the site and onto the adjacent beach without commingling with the ESGS runoff. The existing tank area is currently bermed and any stormwater that collects within the tank farm is pumped to nearby inlets (ESPR 2000a).

The site drainage plans are shown on the revised AFC figures 2A and 2B (ESPR 2002a, ESPR 2002ee). Staff also had conversations with Brian Frieze, Project Engineer with Black & Veatch, to clarify how the two drainages shown separately on Figures 2 A and B tie together. Sketches Nos. 098496-051801- 1 and 2 were developed by Black & Veatch to confirm these conditions. This information allowed staff to develop the existing drainage flows for the entire site.

AFC Figures 2A and 2B show grading and drainage plans for the existing and proposed project, and the revisions made to these plans reflecting project modifications clarified existing and proposed stormwater drains, drainage routes, and other features sufficient to assess impacts and identify potential mitigation for runoff. Staff has reviewed the revised drainage figures as well as the sections of the Stormwater Pollution Prevention Plan (SWPPP) used to describe the stormwater facilities and finds them to be adequate for the purposes of impact analysis.

Pacific Ocean And Santa Monica Bay

Santa Monica Bay is the only surface water body in the vicinity of the project with approximately 266 square miles of surface area. Tides are semi-diurnal with large diurnal inequality (two tides of unequal amplitude per 24-hour period).

The California Current, wind and tides affect currents in Santa Monica Bay. The California Current flows to the south and spawns the California Counter Current, which flows to the north inshore of the Channel Islands. Nearshore currents are strongly influenced by the tides, with a net current typically to the south due to the predominant winds from the west-northwest. Nearshore current speeds are on the order of 5 to 10 cm/s, (0.03 to 0.3 feet/second) with a net speed on the order of 0 to 2 cm/s (0.0 to 0.07 feet/second). The tidal current component is to the north during flood and to the south during ebb.

Beneficial uses of the bay identified by the RWQCB (1994) are:

- Water contact recreation
- Non-contact water recreation
- Industrial service supply
- Navigation
- Commercial and sport fishing
- Marine habitat
- Wildlife habitat
- Preservation of biological habitat
- Preservation of rare and endangered species
- Migration of aquatic organisms
- Spawning, reproduction and/or early development

Santa Monica Bay Nearshore and Offshore Zones have been designated as impaired and placed on the 303(d) list of the Clean Water Act. Stormwater discharges have been identified as a major source of contaminants to Santa Monica Bay (Bay et al., 1999). Staff has obtained stormwater outfall data for the 24-inch storm drain located at the SW corner of the project site. The ESPR is not the source of this stormwater, but rather off-site runoff up-slope of the project. A drainage system that routes flows around the site discharges at this drain at the SW corner of ESPR.

Groundwater Hydrology

The ESPR site is located within the Old Dune Aquifer, Gage Aquifer, and Silverado Aquifer systems that primarily consist of sand and gravel. These shallow aquifers are separated by the presence of aquitards, which primarily consist of clay material. However, the Old Dune Sand and Gage Sand Aquifers are not separated at the ESPR site due to the absence of the Manhattan Beach Aquitard in the project area. The El Segundo Aquitard underlies the Old Dune Sand and Gage Sand Aquifers. Studies conducted in 1998 reveal that the El Segundo Aquitard may isolate both of them from the Silverado Aquifer (ESPR 2000a).

The depth of the aquifers is considered shallow, extending to about 100 feet below ground surface. Groundwater elevations at the ESPR site have been found at approximately 12 feet below ground surface under unconfined conditions. The expected groundwater levels are estimated to occur at about 7 feet below the bottom elevations of proposed structures. An approximate 0.3-foot elevation change on the western side of the site indicates that the water levels are tidally influenced. Measurements taken for direction of groundwater flow for the Old Dune Sand/Gage Sand Aquifers and within the sand layers of the El Segundo Aquitard suggest northwest and southeast gradients, respectively.

Because of the poor water quality within the aquifers, the groundwater is not used for domestic and certain agricultural purposes. The proposed ESPR site would not use groundwater as part of the project (ESPR 2000a). There is extensive near-surface groundwater contamination beneath the entire project site. These conditions are discussed in the Contaminated Soils and Groundwater Section below.

Soils

The existing ESGS site in the area of the proposed Units 5, 6, and 7 occurs at about 20 feet above Mean Lower Low Water (MLLW) level and is relatively flat. Santa Monica Bay is located west of the ESPR site. Vista Del Mar highway borders the eastern portion of the ESGS site and occurs at an approximate elevation of 94.0 feet above MLLW. The steep slope between the power units and Vista Del Mar is 1 (horizontal) to 1 (vertical), and is kept stable via 3 retaining walls that are approximately 6 feet high. The power plant and on-site facilities are located within the Oceano soil mapping association. Very slow runoff, rapid permeability, and high susceptibility to wind erosion characterize these soils. As a result this soil has low water capacity and chemical properties for nutrient retention.

The majority of the site has been previously graded and is covered with asphalt. An exception is the steep slope between the power units and Vista Del Mar, which is landscaped with vegetation. Grading for the proposed Units 5, 6, & 7 would be relatively flat, close to existing grade, and sloped to drain towards the site stormwater system. The proposed final elevation would be approximately 20 feet MLLW above (ESPR 2000a).

The existing fuel tank storage area, which is proposed for construction laydown/staging/parking and a new access road, occurs at an elevation of approximately 39 feet above MLLW. The tank area is flat and is surrounded by an asphalt berm (ESPR 2000a).

All proposed construction activities including the off-site pipelines, all parking, and staging areas (with the exception of the Kramer and Federal Express sites) are located within the Oceano Association. Over time, this soil has been disturbed as part of the site's past development activities.

The worker parking areas occur on the Ramona-Placentia associations. This association is found on slopes ranging from 2 to 5 percent. The Ramona-Placentia association, which is moderately well drained, exhibits slow runoff and therefore results in a slight erosion hazard. However, the subsoil exhibits slow permeability that can

result in increased runoff and erosion. Because the Ramona-Placentia association consists of fine textured loam material, it exhibits moderate fertility and high shrink-swell properties

The off-site staging areas would be located on the Cropley soil association. This soil association is located on valley floors and alluvial plains. The upper soil horizons are well drained, therefore, runoff is slow and the erosion hazard is slight. The subsoil characteristics consist of clay, which creates slow permeability, increased runoff and erosion. Although this soil association exhibits high natural fertility, the high shrink – swell potential poses limitations for certain vegetation practices (ESPR 2000aa).

Contaminated Soils and Groundwater

A Phase I Environmental Site Assessment was conducted by ESP II to identify "recognized environmental conditions" that may exist on the ESGS site and along the proposed pipelines. In addition, an environmental database review was conducted to identify areas of environmental concern within a 1-mile radius of the ESPR project site while previous subsurface investigation reports were reviewed (ESPR 2000a).

This Phase I Environmental Site Assessment report dated November 2000, determined that "...total petroleum hydrocarbons (TPH) and volatile organic compounds (VOCs) have been detected in soil and groundwater beneath ESGS. Quarterly groundwater monitoring is conducted by Chevron in accordance with the LARWQCB requirements stipulated in Chevron's Cleanup and Abatement Order 88-055" (ESPR 2000a).

According to the November 2000 Phase I ESA and the AFC, several environmental conditions have been identified, and include (ESPR 2000a):

- ESGS Site: The soil and groundwater below ESGS contains total petroleum hydrocarbons TPH and VOCs.
- Retention Basins: The groundwater below the retention basins contains TPH, VOCs, and metals.
- Aboveground Storage Tanks (ASTs): The soil and water below the above ground storage tanks contain TPH.
- Transformers: Oil staining was evident in the bedding material below and surrounding the transformers adjacent to Units 1 through 4.
- Hazardous Waste Storage Area: The soil and groundwater near the Hazardous Waste Storage area contains VOCs.

Previously, a Phase II Environmental Site Assessment (ESA) had been conducted by SCE on October 21, 22, and 23 1996, and January 31, 1997 at the ESGS to evaluate soil and groundwater conditions at areas identified as "recognized environmental conditions" (RECs) or "areas of potential concern" (AOPC). The objectives of this ESA were to determine if any actions are required to address the hazardous materials occurring at the facility and to obtain details on the nature and amount of contaminants identified (Southern California Edison 1997). The following is a list of RECs or AOPC that were identified during the investigation, how each was addressed, and the conclusions developed for each one (Southern California Edison 1997):

- Chevron USA Inc. Refinery: Petroleum hydrocarbons were identified in the soil and groundwater beneath the ESGS site from a release at the Chevron Refinery. Chevron is remediating the soil and groundwater by vapor extraction and pump and treat methods. No further actions were recommended.
- Displacement Oil Tank: Previous surveys identified petroleum hydrocarbon-impacted soil beneath the displacement oil tank. Because the soil was characterized prior to the Phase II ESA, sampling was not conducted and no further action was recommended. Further sampling and/or remediation may be necessary as part of facility decommissioning.
- Aboveground Storage Tanks (ASTs): Petroleum hydrocarbon-impacted soil was encountered beneath the south fuel oil storage tank during prior investigations. The LARWQCB approved the plan of leaving the soil in place until the tank is decommissioned or removed from the site. No further action was recommended, however, further sampling and/or remediation may be necessary as part of facility decommissioning.
- Retention Basins: According to the Phase II ESA, "Edison is in the process of implementing a Groundwater Quality Monitoring Program in the vicinity of the retention basin and boiler chemical cleaning basin. Quarterly monitoring reports will be submitted to the Department of Toxic Substances Control (DTSC)" (Southern California Edison 1997). No further assessment was conducted.

Staff has received a subsequent Phase II Soil Investigation on the Boiler Chemical Cleaning Basin (September 23, 2001), a Site Investigation on the South Oil Storage Tank (May 1995), and a Quarterly Sampling Report (August 2001) as part of recent ESPR data responses.

Staff has also reviewed soils and water quality data from the BayKeepers stormwater outfall monitoring program, and information from DTSC consent decree on potential soil contamination under the retention pond. The DTSC has an on-going program to remediate contaminated soils beneath the retention basin. This data was used to complete the existing site conditions that are addressed below in the Impacts, Contaminated Soil and Groundwater subsections of this FSA. Please also refer to the **Waste Management** section of this FSA for a full discussion of these potential impacts.

Existing Water Needs

The ESGS currently utilizes seawater, potable water, and reclaimed water for its plant processes. A discussion of these water uses and amounts used within the plant follow.

The ESGS is supplied with potable water from the City of El Segundo, which receives its water from the Metropolitan Water District of Southern California. The AFC reported approximately 0.18 mgd of potable water usage at the ESGS during 1999 (ESPR 2000a).

Tertiary treated reclaimed water is supplied to the ESGS by the West Basin Municipal Water District, which receives its water from the Hyperion Treatment Plant. Reclaimed water is primarily used at ESGS for landscape irrigation and to supplement "seal water." Seal water acts as a lubricant and coolant for the cooling water circulation equipment.

The seal water is discharged through the ocean outfall. Reclaimed water accounted for approximately 0.08 mgd water usage at the ESGS during 1999 (ESPR 2000a).

Cooling water for the ESGS is supplied by the Santa Monica Bay through two separate ocean water intakes. The maximum volume of cooling water currently allowed for use at the existing Units 1 and 2 is 207 mgd (**Soil and Water Resources Table 1**). However, for the five-year period from January 1996 through December 2000 the average daily flows at Units 1 and 2 ranged from 58.2 mgd to 77.4 mgd. The daily flow rates for Units 1 and 2 averaged 69.2 mgd for this five-year period, or approximately one-third of the of 207 mgd for which the Applicant is now seeking approval for the ESPR project (**see Biological Resources Table 4**).

Once the water travels through the intake structures and is passed through screens for debris removal, it is directed to four vertical wet pit type circulating water pumps. For plant equipment cooling purposes, these pumps supply water to the main condensers and auxiliary heat exchangers. The circulating water pumps located in the two existing generators pump the cooling water to the condensers. The temperature of the water is raised 27 °F at maximum load as it passes through the cooling system. The flows from the two condensers then join and are discharged to the ocean at 2.1 feet per second (ESPR 2000a).

EXISTING COOLING SYSTEM

Cooling Water Withdrawal

The existing ocean water intakes, discussed above, withdraw cooling water from Santa Monica Bay from about 2,600 ft offshore through two submerged intakes, one each for Units 1 & 2 and Units 3 & 4. The intakes are open-ended vertical conduits fitted with velocity caps to reduce fish entrainment. The intake structure characteristics and flows are summarized in **Soil and Water Resources Table 1** below.

The cooling water withdrawal can affect the aquatic biota of Santa Monica Bay through impingement and death of fish on the traveling screens, entrainment of fish eggs and larvae into the cooling system, and entrapment of biota with the cooling system structures. These issues are addressed in the **Biological Resources** section of this FSA.

SOIL & WATER RESOURCES TABLE 1
El Segundo Generating Station Cooling System Characteristics

	Units 1 & 2	Units 3 & 4	Units 5, 6 & 7 ⁽¹⁾
Capacity (MW)	350	670	647
Cooling water flowrate (mgd)	207	398	207
Waste heat loading (BTU/day)	46.49 x 10 ⁹	73.33 x 10 ⁹	33.3 x 10 ⁹
Discharge temperature rise (°F)	27	22	19.3
Intake			
Distance offshore (ft)	2,590	2,595	2,590
Dimension (ft)	14.6 x 17.3 x 2 (H)	16 x 21 x 2 (H)	14.6 x 17.3 x 2 (H)
Intake velocity (ft/s) ⁽²⁾	0.64	0.92	0.64
Height above bottom (ft)	10	~10	10
Discharge			
Distance offshore (ft)	1,990	2,090	1,990
Water depth at MLLW (ft) ⁽³⁾	29	31	29
Height above bottom (ft)	8.2	~10	8.2
Dimensions (ft)	φ 14	23 x 18	φ 14
Discharge velocity (ft/s)	2.1	1.5	2.1

⁽¹⁾ Proposed in El Segundo Redevelopment Project - φ is the Inside Diameter

⁽²⁾ Horizontal velocity at edge of intake

⁽³⁾ Mean Lower Low Water

Cooling Water Discharge

Currently, the ESGS discharges cooling water to Santa Monica Bay through two single port, submerged outfalls, for Units 1 & 2 and 3 & 4 respectively. The outfalls discharge the heated cooling water vertically upward at about one third of the water depth from the bottom. This discharge creates a “boiling” appearance at the water surface. The characteristics of these outfalls are summarized in **Soil and Water Resources Table 1**.

A characterization of the thermal plume was conducted in 1972-73 and summarized in a report entitled Thermal Effect Study (Benson et al. 1973, ESPR 2000a). The plume characterization was based on vertical temperature profiles at a grid of fixed locations, and temperature measurements at a vertical array of sensors towed by a small boat. Limitations of this characterization include the fact that plant loads for the times of the

surveys are not mentioned, and measured temperatures at a point 1,500 ft from the discharge were assumed to represent natural ambient conditions. General experience with thermal plumes, simple heat balance calculations, and the modeling described below indicate that a distance greater than 1,500 ft is needed to reach ambient temperatures. This assumption had the effect of raising the ambient temperature and decreasing reported temperature rises, producing a somewhat unrealistic estimate of the actual thermal impacts.

The AFC quotes the Thermal Effects Study statement that “considerable cold water is entrained by the rising water is evident from the diameter of the surface manifestations and from their temperatures, which may be only 5°F above natural” (ESPR 2000a and Benson et al). However, temperature measurements in the boil itself are not presented, and the reported temperature rises are distorted by the ambient temperature assumption. Realistically, dilution in the mixing zone can be expected to be relatively small because of the small distance between the discharge and the water surface. This distance is less than the length of the zone of flow establishment of the discharge jet (about 6.3 times the discharge diameter) indicating that the temperature at the center of the jet would be essentially equal to the discharge temperature.

Some entrainment occurs at the periphery of the jet, but that entrainment is limited because of the short travel distance, and the fact that near the surface the fluid surrounding the jet is the thermal plume itself. Estimates of overall dilution in the vertical jet that consider the internal hydraulic dynamics can be made from graphs developed based on experimental data and theoretical analyses (Wright et al. 1990). These lead to an average predicted dilution factor of about 1.9 for both Units 1 & 2 and 3 & 4.

Beyond the zone of initial dilution in an area called the farfield, the AFC and the Thermal Effect Study provides information on the 4°F and 1°F isotherms. Because of the assumption of ambient temperatures at 1,500 ft from the discharge, these results are underestimates. Therefore, to provide information, which could be used to evaluate the thermal plume impacts, Energy Commission staff developed a two-dimensional model of the thermal plume (Thermal Discharge Analysis). The model was principally applied to the proposed conditions and it is described in the Environmental Impacts section below. The 1972/73 thermal plume assessment established that the thickness of the thermal plume in the farfield was on the order of 5 to 10 ft. This observation is independent of the ambient temperature assumption and therefore valid.

Wastewater Discharges

The total maximum flow, which as discussed previously does not always occur, is approximately 607 mgd of wastes and consists of once-through cooling water, treated chemical metal cleaning wastes, storm water, non-chemical metal cleaning wastes, low volume inplant wastes and treated sanitary wastes are discharged from the existing ESGS into Santa Monica Bay. At one time the treated metal cleaning wastes and other low volume wastes were stored in a retention basin prior to discharge to the bay. However, from several discussions with plant site personnel and the LARWQCB, these treated metal wastes are currently being transported off-site and not discharged to the retention pond.

Units 1 and 2 discharge wastewater through Outfall No. 001 and Units 3 and 4 discharge through Outfall No. 002. Outfall No. 001 is located approximately 1,989 feet offshore and Outfall No. 002 is located approximately 2,091 feet offshore. All wastewater disposed to the Santa Monica Bay is permitted under an existing NPDES permit (ESPR 2000a).

NPDES Permit

Pursuant to Division 7 of the California Water Code, the LARWQCB adopted Order 00-084 at a June 29, 2000 public hearing. This order serves as the operating NPDES (No. CA0001147, CI 4667) permit for the ESGS and expires May 10, 2005. Included in this permit are the facility waste discharge requirements (Order No. 94-129) that were initially adopted December 5, 1994. The permit was originally issued to SCE, the previous owner of the facility. The current applicant acquired the ESGS in April 1998. The permit includes the following findings:

- Tiered treatment unit (TTU) permits from the DTSC that allows for treatment of hazardous wastes on-site. The treated metal cleaning wastes and other low volume wastes are stored in the retention basin prior to discharge to the Ocean through Outfall No. 2.
- Stormwater runoff and floor drain wastes are passed through oil/water separators and then combined with the cooling water and treated sanitary wastes prior to discharge to the Ocean through Outfalls No. 1 and 2. The Stormwater runoff from upslope of the facility flows into an easement conveyance and then to the beach without commingling with the industrial activity's associated runoff.
- The 1998 California 303(d) list of impaired water bodies (approved by EPA in May 1999), identified Santa Monica Bay (Offshore, Nearshore and Dockweiler Beach) as impaired with regards to certain pollutants, which include: polychlorinated biphenyls (PCBs); polycyclic aromatic hydrocarbons (PAHs); selected heavy metals including lead, copper, and zinc; and debris.
- The monitoring program in this Order has not been changed from that of the 1994 permit. The Regional Board will complete a comprehensive review of this monitoring program in conjunction with other monitoring efforts including the Los Angeles County Municipal Storm Water permit renewal. This review is scheduled to be completed in 2001/2002.
- The requirements contained in the Order, as they are met, will be in conformance or in compliance with the goals of the aforementioned water quality control plans and statutes.

While the project will produce various and separate wastestreams, they will ultimately be combined with the other site discharges, the largest of which will be the sea water for the once through cooling system. Staff agrees that the current NPDES permit is valid for all pre- and post-construction ESPR discharge activities.

ENVIRONMENTAL IMPACTS

EROSION, SEDIMENTATION, AND SITE DRAINAGE

Accelerated wind and water-induced erosion may result from earthmoving activities associated with construction of the ESPR. Activities that expose and disturb the soil leave soil particles vulnerable to detachment by wind and water. The Los Angeles metropolitan area, being a semi-arid environment, may encounter rainstorms of short duration and high intensity. Runoff from these storm events coupled with earth disturbance activities can potentially accelerate on-site erosion eventually resulting in increased sediment transport to nearby receiving waters.

Site excavation work would consist of the removal, storage, and/or disposal of earth, sand, gravel, vegetation, organic matter, loose rock, boulders, and debris to the lines and grades necessary for construction. Embankments would be graded no steeper than 2:1 and would be reinforced to meet geotechnical requirements (refer to Geologic Resources within this FSA). The applicant has discussed surficial slope stabilization procedures as well as other proposed Best Management Practices in draft Stormwater Pollution Prevention Plans (SWPPPs) submitted in January and July 2002 (ESPR 2002a, 2002ee). The applicant has identified the tank farm area as the on-site stockpile location. Excess non-hazardous material not capable of being stored on-site would be hauled to an approved off-site Class III landfill (ESPR 2000a).

Backfilling activities would involve the removal of unsuitable material and rocks, followed by proper compaction techniques. Embankments, dikes, bedding for buried piping, and backfill surrounding structures would be compacted to a minimum of 90 percent of the maximum dry density. General backfill placed in remote or unsurfaced areas would be compacted to a minimum of 85 percent dry density. Road subgrades, sub-bases and base courses would be prepared and compacted in accordance with California Department of Transportation (CalTrans) standards (ESPR 2000a).

During construction, approximately 46 acres of land associated with the ESPR project would be disturbed. The project would not impact the beach and, therefore, would not effect beach erosion. To minimize erosion and potential sedimentation from construction activities, a Storm Water Pollution Prevention Plan would be implemented. Standard erosion runoff and sedimentation techniques, in accordance with the California NPDES General Permit for Storm Water Discharge Associated with Construction Activity, would be developed and implemented for construction, post-construction, and operational phases (ESPR 2000a). No significant erosion or sedimentation impacts are expected.

Site Drainage

Staff performed a drainage impact analysis based on the information listed below:

- Supplemental data requests from January to July 9, 2002 (ESPR 2002a, 2002ee)
- SWPPP revisions made January 28, to July 9, 2002 (ESPR 2002a, 2002ee)
- Continuous revisions to the AFC Figures 2B, 12B and 13B made through July 9, 2002 (ESPR 2002a, 2002ee)

- Project description amendments PDA 1-20, furnished June 17, 2002

Based on the above information, staff has assumed a conceptual drainage and stormwater facility design. This design, which has changed several times during the course of this evaluation, was used to assess the drainage impacts, mitigation and LORS compliance issues.

The revised project description leaves uncertainty regarding whether the facility's drainage capacity would be sufficient to reduce the runoff impacts due to the design storm to less than significant. While the proposed project design has the potential to cause significant water quality impacts due to stormwater runoff for both the construction and continued operation of the proposed project, these impacts will be mitigated to less than significant by the construction and operational NPDES permit and SWPPP requirements. Staff has proposed additional drainage mitigation requirements and Conditions of Certification to address these issues.

CONTAMINATED SOILS AND GROUNDWATER

According to the AFC, dewatering would be conducted during demolition of the existing Unit 1 and 2 foundations and during construction of the new project because the high groundwater conditions found on this site have potential for contamination. To comply with the applicable regulatory requirements set forth by the LARWQCB for the treatment and disposal of the dewatering wastes, a Waste Management Plan has been developed for removal of the hydrocarbon plume occurring in the vicinity of the ESGS from operations from the adjacent Chevron refinery (ESPR 2000a).

Please refer to the **Waste Management** section of this FSA for further discussion related to contaminated soils.

PROJECT SPECIFIC IMPACTS

Power Block

The site for the proposed Units 5, 6, and 7 is currently developed and generally flat. No significant grade changes are anticipated for the final grading of this site. Upon demolition of Units 1 and 2, excavation depths would range from approximately 5 to 20 feet. Structural fill to be used as foundation support would be compacted and graded. The newly graded area would result in a surface that is smooth, compacted, free from irregular surface changes, and sloped to drain towards stormwater facilities. The total disturbance for the power block would be approximately 5.5 acres (ESPR 2000a). The Applicant has indicated approximate excavation and fill amounts would be 43,000 and 33,000 cubic yards (cy), respectively (ESPR 2002a, 2002ee).

Any impacts resulting from the proposed construction and operation of the power block would be mitigated to less than significant by adherence to both the Construction Storm Water Pollution Prevention Plan (SWPPP) and the Remedial Investigation Plan for handling of contaminated soils and groundwater.

Tank Farm Laydown & Storage Area

The tank farm would be utilized as a laydown/staging area. The expected acreage to be disturbed for the laydown/storage area is approximately 7 acres. According to Figure 3.5-1B (ESPR 2000r), earthmoving activities would occur within the former Southern California Edison tank farm area and along its western and southern slopes.

The current SWPPPs as of January 2002 (with February 2002 mapping revisions) provide a two-phased power plant construction activity schedule (ESPR 2002a, 2002ee). Phase I of construction activity schedule identifies the removal of the two large fuel tanks (each 219 ft in diameter and 48 ft high) and related excavation prior to the excavation of the power block areas.

The initial construction activities of the Tank Farm Plan would involve tank preparation and the installation of an access ramp. The west and north berms would be removed, and an access ramp would be constructed on the west face of the berm. According to the July 10, 2002 SWPPP, the tank farm access road would be constructed along the southern portion of the existing access road, parallel to the northern tank with the terminus entering the northern section tank farm area. During the initial construction events two sediment basins would be constructed. One sediment basin would be located at the southwestern section of the northern tank and the other sediment basin would be located at the southwestern section of the southern tank. Both sediment basins would be concrete or asphalt lined (ESPR 2002ee).

The second phase would involve the use of the tanks to store excavated concrete and soil from the Unit 1 and 2 areas. This phase would also include the removal of above ground piping that lies between the two tanks as well as the construction of the proposed southern berm.

The next phase would involve the removal of the existing berms and clearing and hauling material to off-site locations. Other features involved with this phase include stockpiling re-usable material, importing any fill required for the southern berm, construction of a retaining wall, construction and relocation of stormwater facilities, and landscaping.

The final phase involves the preparations of the tanks for material storage, and the subsequent demolition of Units 1 and 2 (ESPR 2002ee). The construction SWPPP and Erosion and Sedimentation Control Plan (ESCP) will prevent potentially significant impacts from occurring.

Ancillary Facilities

Earth disturbance for the installation of tanks and a gas compressor would be 0.5 acres and 0.15 acres, respectively. An administration building would be constructed between the tank farm and existing retention basin. The building would be constructed on an existing level elevation of 25 feet above MLLW

The mapping on Figure 12-B (ESPR 2002ee) depicts a proposed access road to be cut and filled along the tank farm's western slope. The slope of the road would be pitched at four percent and have crowned slopes pitched at approximately two percent on each

side. Side slopes above and below the roadway would be 2:1. Both cut and fill slopes are designed to drain into concrete lined v-shaped ditches.

The applicant has indicated the approximate excavation of contaminated material would be 10,000 cubic yards (cy). Non-contaminated excavation of the western berm would be approximately 6,000 cy. The fill required for this area would be approximately 18,000 cy. The fill would consist of excess material from the power block, reclaimed/potable water line area, and the western berm areas (ESPR 2000aa). A discussion of BMPs can be found in the Applicant's and Staff Recommended Mitigation Measures and the Conditions of Certification sections below. Staff does not expect any significant impacts to result from the construction and operation of the ancillary facilities provided the COCs are properly implemented.

Linear Facilities

Temporary and permanent disturbances related to construction of linear facilities (pipelines) are expected to occur within the existing ESGS site as well as off-site within the Cities of El Segundo and Manhattan Beach. Proposed off-site pipelines would be located in developed areas, including corridors that are typical of urbanized settings. Off-site pipelines would consist of reclaimed water, potable water, sanitary sewage, and aqueous ammonia lines. Storm water pipelines would be constructed on-site and would require reconnections at the site boundary (ESPR 2000a).

Pipeline construction would entail the removal of any vegetated or paved areas within the pipeline right-of-ways. Total earth disturbance during the installation of the pipelines would be approximately 13 acres. Linear and width disturbance activities would be 1.88 miles by 45-feet, respectively. Pipeline construction would consist of trenching, pipe installation/interconnection, backfilling, and permanent surface reclamation with paving or sod materials (ESPR 2000a).

Natural Gas Pipeline

Proposed Units 5, 6, and 7 would utilize the existing on-site natural gas pipeline; therefore, no new pipelines or new impacts would be required for natural gas transmission (ESPR 2000a).

Electric Transmission Line

The primary on-site linear interconnections for electric transmission would be via three proposed transformers that would hook-up to the existing 230 kV switchyard. Earthwork would be required for the installation of tubular steel pole structures and associated foundations. These overhead line structures would be located within the existing on-site transmission corridors (ESPR 2000a). The applicant has not identified the extent of earthmoving or any Best Management Practices (BMPs) to be used for this activity in order to avoid impacts. According to information provided by the California Independent System Operator (Cal ISO) in a transmission system impacts study report, it appears that no earthmoving would be needed for off-site transmission connections (CAISO, 2000a). No significant impacts are expected from this activity.

Water Pipelines

The West Basin Municipal Water District would provide reclaimed water. ESPR would install a 10-inch high-density polyethylene (HDPE) pipe that would extend approximately 1.55 miles from the site to the tie-in point. According to the AFC, the reclaimed water pipeline route would extend from a tie-in point near Richmond Street and El Segundo Boulevard, continue west along El Segundo Boulevard, through Grand Avenue and Vista Del Mar, and finally under a Vista Del Mar overpass to the ESPR site. Total reclaimed water pipeline disturbance would be approximately 8.48 acres (ESPR 2000a).

The proposed potable water supply pipeline would consist of a 14-inch HDPE pipe that would extend approximately 1.75 miles to its tie-in point at the Eucalyptus Drive and El Segundo intersection; 1.55 miles of the 1.75 miles would be installed in the same trench as the reclaimed water line. Therefore, since the potable pipeline would share the same trench as the reclaimed water line, total additional disturbance created by the installation of the potable water pipeline would be approximately 0.20 acres (ESPR 2000a). Trench excavation and fill for the potable and reclaim water lines would be approximately 5,500 cy and 5,000 cy, respectively.

The City of El Segundo requested that the applicant assess alternative locations for reclaimed and potable waterline routes to avoid excavation impacts to historical and biological resources around the streets of Richmond and El Segundo, respectively. See the Alternatives Analysis subsection below for further details on alternative waterline routes.

The AFC lists hazardous waste disposal areas in the vicinity of the ESGS that can accommodate the potential for waste soil. The waste soil is not expected to significantly impact landfill capacity (ESPR 2000a). Construction of the water pipelines is not expected to cause significant impacts.

Sanitary Sewer Pipeline

The sanitary sewer line would tie-in with an existing pipeline located in the City of Manhattan Beach. The 3-inch PVC pipeline would be routed through a proposed on-site lift station through the southern portion of the ESGS property and ultimately an additional 150 feet to the tie-in point at the intersection of The Strand and 45th Street. The approximate disturbance associated with the installation of the sanitary sewer line would be 0.15 acres (ESPR 2000a). The sanitary line would be appropriately sized for workers and visitors. Total excavation and fill amounts would be approximately 50 cy and 45 cy, respectively. Approximately 10 cy of imported fill would constitute a portion of the total fill material (ESPR 2000aa). No significant impacts are expected from this activity.

Aqueous Ammonia Pipeline

The aqueous ammonia line is proposed to tie-in with an existing facility at the Chevron Refinery. The proposed 3-inch carbon steel pipeline would be constructed above ground (ESPR 2000a). The applicant has indicated that the aqueous ammonia line would be placed on existing pipe racks under Vista del Mar Avenue. No earthmoving

activities would be required for this pipeline (ESPR 2000aa), and significant impacts are expected.

Refer to the **Hazardous Materials** section of this FSA for details regarding BMPs to prevent accidental spills.

Off-site Laydown, Parking, and Storage Areas

Temporary earthmoving associated with off-site laydown, parking, and storage areas would be approximately 18 acres (ESPR 2000a). Maps detailing the proposed locations for laydown, parking, and storage areas are depicted as Figure 3.2-1 in the AFC. A description of the proposed Best Management Practices (BMPs) developed to prevent erosion and sedimentation impacts is discussed in the Mitigation section below, and no significant impacts are expected from these activities.

Proposed Water Supply Needs

Potable Water

Potable water from the City of El Segundo (Metropolitan Water District of Southern California) would be supplied to the ESGS for the makeup water for the evaporative coolers, Heat Recovery Steam Generator (HRSG) blowdown, quench water, and miscellaneous plant uses. According to the AFC, potable water usage for the new Units 5, 6, and 7 of the proposed project is estimated at 0.09 mgd (ESPR 2000a).

Each of the combustion turbine generators (CTG) would be equipped with an evaporative cooling system. The coolers would function to reduce the inlet air temperatures when the ambient air exceeds 50 °F. This system is intended to reduce the impact of ambient temperature on electrical output during the warmer seasons when the electrical usage peaks (ESPR 2000a).

The HRSG would function to transfer heat produced from the exhaust gas of the CTG to the feedwater in the HRSG, which would produce steam for the steam turbine (ESPR 2000a). HRSG blowdown and quench water would be supplied to the system for cooling purposes and to reduce emissions.

Reclaimed Water

The tertiary treated water from West Basin Municipal Water District, described in the Existing Water Needs subsection above, would continue to supply the site with irrigation and seal water.

The Data Responses dated May 30, 2001 (ESPR 2000aa) state that West Basin Municipal Water District would provide single-pass reverse osmosis (RO) product water to the ESPR site via a new pipeline (see Water Pipelines above). The reclaimed water would be directed to the steam cycle and to the combustion turbines for steam injection. The AFC estimated that approximately 0.064 mgd of reclaimed water would be needed for operation of proposed Units 5, 6, and 7, and assumed higher corrosivity of the reclaimed water relative to potable water as the reason for not using more (ESPR 2000a). However, any corrosivity and/aggressiveness associated with reclaimed water is easily managed, and is not a significant factor in preventing its more extensive use.

The steam cycle chemical feed system would further treat the water by automatically feeding an oxygen scavenger chemical and a neutralizing amine to the feedwater to control corrosion and scale formation. Sodium phosphate would be manually fed to the HRSG steam drum to control pH and scale formation (ESPR 2000a).

Steam cycle wastewater would be discharged through Discharge No. 001. Wastewater from the HRSG blowdown tank would be routed to the existing retention basin. Wastewater collected from the auxiliary cooling system would be discharged through Discharge No. 001. Reclaimed water used for the combustion turbine steam injection would exit the system via evaporation (ESPR 2000a).

While the applicant has only proposed to maximize the use of reclaimed water, staff has determined that it is feasible to use tertiary treated reclaimed water for all of the plant processes except cooling water. Recycled water uses include plant and equipment drains, makeup to the evaporative cooler, and quench water. This reclaimed water use does not include once-through cooling with recycled water or replace seawater for this purpose at this time. This option is being evaluated separately in the **Biological Resources Alternative Cooling Analysis appendix** of this FSA.

Sea Water

The applicant proposes to use 207 mgd of sea water as once-through cooling water. This sea water would be extracted for the new ESPR facility once-through system from Santa Monica Bay using the existing ESGS once-through cooling intake structures. Chlorine as sodium hypochlorite may be fed, for a maximum of two hours per unit per day, to the condenser tubes to control biological growth (ESPR 2000a). The NPDES permit does not allow the chlorine concentration to exceed the 0.4 mg/L NPDES limit maximum.

To minimize chemical usage for biological control, the plant would "heat treat" the seawater approximately every six weeks. Heat treatment is conducted by reversing the flow through the intake and outfall pipes to remove the marine organisms encrusting the system. Issues related to the use of sea water in a once-through system are more fully discussed in the **Biological Resources** section of this FSA.

Proposed Cooling System

Cooling Water Withdrawal Discharge

The ESPR project would replace the existing Units 1 & 2 with combined cycle units made of two gas turbines (Units 5 and 7) and a conventional steam turbine (Unit 6). The new combined cycle units would utilize the same cooling water intake and discharge as the current Units 1 & 2. The flow rate would remain the same, but the temperature rise at peak load would decrease from 27°F to 19.3°F. Thus, the thermal load at peak power production would decrease by 28 percent. However, because the existing Units 1 & 2 often operate below peak capacity, and the new units would likely provide base load, the actual thermal loading to Santa Monica Bay may increase over the conditions currently existing. Characteristics of the thermal discharge are summarized in **Soil and Water Resources Table 1**.

Refer to the **Biological Resources** section of this FSA for a discussion of entrainment, impingement, and entrapment issues and associated impacts.

A mixing zone analysis was conducted by ESPR for this application using the of the U.S. EPA PLUMES (UM model) package to calculate dilution at the surface (ESPR 2000a). The modeling indicates a centerline dilution at the surface of 1.0, and an average dilution of up to 1.7. The reason for these small dilution values is that the discharge depth below the water surface is small, approximately 20 feet. However, the modeling did not account for the fact that, as the thermal plume nears the surface, it surrounds the jet and considerable re-entrainment occurs. Therefore, the calculated dilutions at the surface are overestimates. On the other hand, the modeling did not take into account the mixing which occurs just outside of the surface impingement zone, in a horizontal internal hydraulic jump (Lee and Jirka 1981, Wright et al. 1990). Therefore, the applicant's mixing zone analysis is both inaccurate and inadequate.

Estimates of mixing zone dilutions were developed by CEC staff for the existing plant based on experimental data and theoretical analyses of vertical round jets in shallow water (Wright et al. 1990). The discharge from the proposed project would have the same flowrate as the existing Units 1 & 2 with a lower temperature rise. This decreases the buoyancy of the discharge jet. However, because the plume in the mixing zone is primarily controlled by momentum, rather than buoyancy, these dilution estimates remain valid. Thus, average plume dilution at the edge of the mixing zone would be on the order of 1.9. The corresponding temperature rise, at peak power capacity, is 10°F. The temperatures rise at the center of the boil itself can be expected to be essentially equal to the discharge temperature rise, i.e., 19.3°F. This is confirmed by measurements conducted on August 10, 1971 (Eliason and Foote, 1972), which substantially support the results obtained by staff.

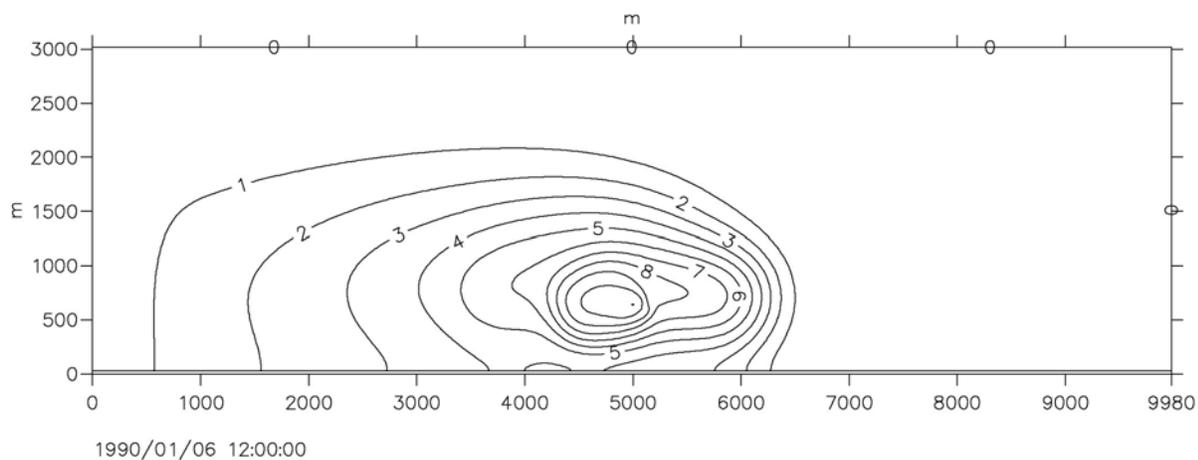
Those measurements give a maximum surface temperature rise of 21°F, which is equal to the discharge temperature rise, and indicates no dilution at the center of the boil. Moving away from the center of the boil, the temperature rise decreases rapidly, within the zone of initial dilution, then more slowly, as temperature reductions are due to surface heat transfer. The temperature rise at the edge of the zone of initial dilution is about 11°F, indicating a nearfield dilution of about 1.9, consistent with the above calculations. The word "about" is used, because the edge of the zone of initial dilution is a transition zone rather than a clear point. These measurements clearly contradict the applicant's claim that the initial dilution is on the order of 10 (ESPR 2000aa).

Beyond the mixing zone, the thermal plume spreads radially with little additional dilution and a relatively uniform thickness. Currents then carry the thermal plume, and the waste heat is transferred to the atmosphere, resulting in a gradual reduction of temperature rises. To provide estimates of the thermal plume characteristics for environmental impact evaluation for the proposed plant alone and together with the Scattergood thermal discharge a two-dimensional modeling analysis was conducted by staff using the MIKE 21 software package (DHI 1995).

The MIKE 21 model solves the complete, two-dimensional, transient flow and transport equations using a sophisticated finite differences algorithm with a rectangular grid. For this application, a grid extending 33,000 ft along shore and 10,000 ft offshore was developed with a 65-ft square grid spacing. A uniform depth was specified, equal to the thickness of the thermal plume. Depths of 5 ft and 10 ft were used and found to have minimal impacts on the predicted temperatures. Along shore currents were specified with a net southerly current of 0.03 ft/s and a tidal component of 0.15 ft/s. These currents are representative of conditions in the area.

The discharge from El Segundo Generating Station was simulated as flows spreading radially from the two outfalls, with a dilution factor of 2, i.e. the flows and temperature rises were those listed in Table 2 respectively multiplied and divided by 2. A surface heat transfer coefficient of 220 BTU/ft²/°F/day was used, corresponding to summer conditions. During winter a smaller heat transfer coefficient can be expected. Calculated temperature rises for the proposed El Segundo Generating Station (Units 3 & 4 and 5, 6 & 7) at full capacity are shown in **Soil and Water Resources Figure 1**. These temperature rises correspond to quasi- steady state conditions, i.e., the contours vary during the tide cycle, moving up and down shore, without significant changes in shape or size.

SOIL AND WATER RESOURCES FIGURE 1
Predicted Temperature Rises for El Segundo Plant at Full Capacity
Temperature Change in °F Over Distance



The calculated 4°F temperature isotherm extends 6,300 to 8,900 ft from the discharge point depending on the time in the tide cycle, with an area of about 800 acres. The 4°F temperature rise isotherm intersects the beach over a length of 2,000 to 3,000 ft. Contrary to statements in the AFC, the foregoing results show that the thermal plume would violate the following requirements of the California Thermal Plan for a new discharge:

The discharge of elevated temperature wastes shall not result in increases in the natural water temperature exceeding 4 °F at (a) the shoreline, (b) the surface of any ocean substrate, or (c) the ocean surface beyond 1,000 feet from the discharge system. The surface temperature limitation shall be maintained at least 50 percent of the duration of any complete tidal cycle.

The LARWQCB has determined that the thermal discharge from the ESPR project would be classified as an "existing discharge" (California Regional Water Quality Control Board 2001). Because the discharge is presently permitted under NPDES and would remain so under the conditions of the proposed project, the numerical requirements described above would not need to be met at this time. See the **Biological Resources** section of this FSA for assessment of thermal effects on aquatic biological resources.

Wastewater Discharges

The proposed project involves a new sanitary wastewater connection pipeline, which would transport sanitary waste from the ESGS offsite to the local municipal wastewater treatment facility, thereby eliminating discharge of sanitary waste to the bay (ESPR 2000a).

Sanitary waste and equipment washwater would be generated during demolition activities. Construction related sanitary wastes would be collected on-site in portable toilets and transported to a sanitary wastewater treatment facility. Equipment washwater has the potential for contamination. The wash water would either be collected and contained on-site at designated wash areas and transported to a wastewater treatment facility or it would be directed to the construction stormwater runoff collection system. The latter discharge would be addressed through NPDES permit requirements (ESPR 2000a).

According to the AFC, an existing retention basin would collect approximately 0.15 mgd of wastewater discharged from the HRSG blowdown, evaporative cooler blowdown, and effluent from the oil/water separator collected from the plant and equipment drains. The discharge from the retention basin would be routed to the existing Discharge No. 001, when Units 3 and 4 are not in operation, and combined with approximately 207 mgd of cooling water discharge. When Units 3 and 4 are in operation, the discharge would be combined with the cooling water discharge and directed to Discharge No. 002 (ESPR 2000a).

The AFC discusses Clean Water Act (CWA) section 303(d) status of Santa Monica Bay, and presents a list of pollutants/stressors for which the bay exceeds water quality standards (ESPR 2000a, Table 5.5-5). Staff requested additional data, which was partially furnished. However, AFC Table 5.5-5 only provides a list of constituents for which the project has NPDES effluent limits. AFC Table 5.5-22, Expected Process Waste Characterization, does not list all relevant in-plant process waste streams, nor does it include estimated concentrations for the 303(d) constituents listed on AFC Table 5.5-5 based on expected source water concentrations.

These process waste streams include segregated floor drains for chemical feed areas, wash wastes, and RO/demineralized/softener regenerate wastes before they are commingled with any other waste streams. Water quantity and quality data were requested to better define the water supply and waste discharge water quality for these waste streams, including the 303(d) listed parameters.

To further characterize the combined process waste streams, the flow diagrams for in-plant waste streams and discharge points have been revised to show flows to the detention pond, outfalls, and the sewer. The applicant provided the following two additional tables to show individual waste streams. **Soil and Water Resources Table 2** provides characterization for those waste streams associated with the HRSG blowdown tank. **Soil and Water Resources Table 3** provides characterization for the blowdown tank waste stream and the plant and equipment drains waste stream. Refer to AFC Figure 3.4-6 for these waste streams and their associated flow rates. Revised

AFC Figures 3.4-5 and 3.5-6 provide preliminary water mass balance diagrams for maximum daily water use and average daily water use, respectively.

Soil and Water Resources Table 2
BLOWDOWN TANK CHARACTERIZATION
(mg/L as ions, except as noted)

Constituent	HRSG Blowdown	Evaporative Cooler Blowdown	Quench Water	Blowdown Tank Effluent ¹
Flow, gpm	26	10	16	52
Calcium	0	143	46	41
Magnesium	0	59	19	17
Sodium	1	195	59	56
Potassium	0	9	3	3
M-Alkalinity, as CaCO ₃	0	340	100	96
Sulfate	0	426	129	121
Chloride	1	198	60	57
Nitrate	0	0	0	0
Fluoride	0.00	0.60	0.20	0.18
Aluminum	0.00	0.20	0.08	0.06
Silica	1	NR	NR	1
TDS	3	1443	440	413
PH	9-9.5	8.1	8.1	8.2-8.5
TSS	0	< 1	NR	< 1
Phosphate	10	0	0	5
Ammonia	0.1	0	0	0
Oil and grease	0	0	0	0
BOD5	ND	ND	ND	ND
COD	ND	ND	ND	ND

¹ Blowdown Tank Effluent is the combination of the HRSG Blowdown, Evaporative Cooler Blowdown, and the Quench Water.

² All numbers are approximate

NR – Not Reported

ND – Not Detected

Soil and Water Resources Table 3
EXISTING RETENTION BASIN EFFLUENT CHARACTERIZATION
(mg/L as ions, except as noted)

Constituent	Blowdown Tank Effluent	Plant & Equipment Wastewater	Retention Basin Effluent ¹
Flow, gpm	52	18	70
Calcium	41	46	43
Magnesium	17	19	18
Sodium	56	59	57
Potassium	3	3	3
M-Alkalinity, as CaCO ₃	96	100	97
Sulfate	121	129	123
Chloride	57	60	58
Nitrate	0	0	0
Fluoride	0.18	0.20	0.18
Aluminum	0.06	0.08	0.06
Silica	1	NR	1
TDS	413	440	420
PH	8.2-8.5	8.1	8.1
TSS	< 1	< 1	< 1
Phosphate	5	0	4
Ammonia	0	0	0
Oil and grease	0	0	0
BOD5	ND	ND	ND
COD	ND	ND	ND

¹ Retention Basin Effluent is the combination of the Blowdown Tank Effluent and the Plant and Equipment Wastewater.

² All numbers are approximate

NR – Not Reported

ND – Not Detected

Staff has reviewed the data responses and revised facility flows for the in-plant waste streams and found the data for the individual flows to be minimally adequate. For example, the retention basin effluent should have actual data for the existing operations, and these should then be estimated for the proposed project (Units 1 & 2 deleted and Units 4, 5, & 6 added). However, there are sufficient data to reach conclusions on potential impacts, particularly for metals.

Staff finds that while the proposed operations are within the requirements of the existing NPDES permit, major changes in generator operation characteristics for power units 4, 5, and 6 will most likely result in different impacts. Discussions with the LARWQCB and review of recent site monitoring report data indicate that although there are some differences, impacts from in-plant waste stream discharges are not likely to be significant.

The LARWQCB indicated that when the NPDES permit is renewed the discharge limits may be adjusted to conform with the California Toxics Rule and future Santa Monica

Bay receiving water TMDL programs. Impacts from in-plant waste streams are required to be in compliance with both existing and any revised NPDES permit conditions. A Condition of Certification (**Soil and Water-7**) has been developed to require the sampling and analysis of each waste stream prior to mixing with any other waste stream to confirm that the estimated constituent concentrations are reasonably accurate.

SPILL PREVENTION

The applicant has indicated that hazardous materials stored on-site during construction will consist of, but are not limited to, fossil fuels, paint, solvents, welding materials, adhesives, oil and lubricants. The applicant has identified that all construction-related hazardous materials would be stored on-site in small volumes. In the event of a large spill, the spill area will be contained, and contaminated soil would be excavated, placed in barrels, and hauled to a proper disposal area (ESPR 2000a).

Major hazardous materials stored on-site during operation of the proposed ESPR include, but are not limited to, aqueous ammonia, natural gas, hydrogen gas and other gases. With the exception of storage for aqueous ammonia in a 20,000 gallon tank, all hazardous materials will be stored in aboveground facilities. The storage areas will be surrounded by containment structures with a volume at or greater than tank capacity, plus the volume for a 50-year frequency, 24-hour duration storm runoff event. Surface coatings and concrete curbs will be used for protection/containment, respectively (ESPR 2000a). No significant impacts are expected provided appropriate BMPs are implemented. Refer to the **Hazardous Materials Management** section of this FSA for additional information on this issue.

CUMULATIVE IMPACTS

Erosion and Sedimentation

Construction and operational activities related to the ESPR project may cause accelerated wind and water erosion. If the applicant's and staff mitigation measures and the proposed Conditions of Certification are implemented, the contribution of the project to any cumulative impacts would be less than significant.

Thermal Discharge

The Scattergood Generating Station operated by the Los Angeles Department of Water and Power withdraws and discharges cooling water in Santa Monica Bay about ½ mile north of the El Segundo Generating Station. Staff modeled the thermal plume with the addition of the Scattergood power plant data when operating at full capacity. The corresponding discharge flow and temperature rise were 495 mgd and 16°F, respectively, with all other parameters unchanged. The resulting calculated temperature rises are plotted in **Soil and Water Resources Figure 2**. The cumulative 4°F temperature rise isotherm has an area of about 1,500 acres and intersects the beach over a length of about 13,000 ft consistently during the tide cycle.

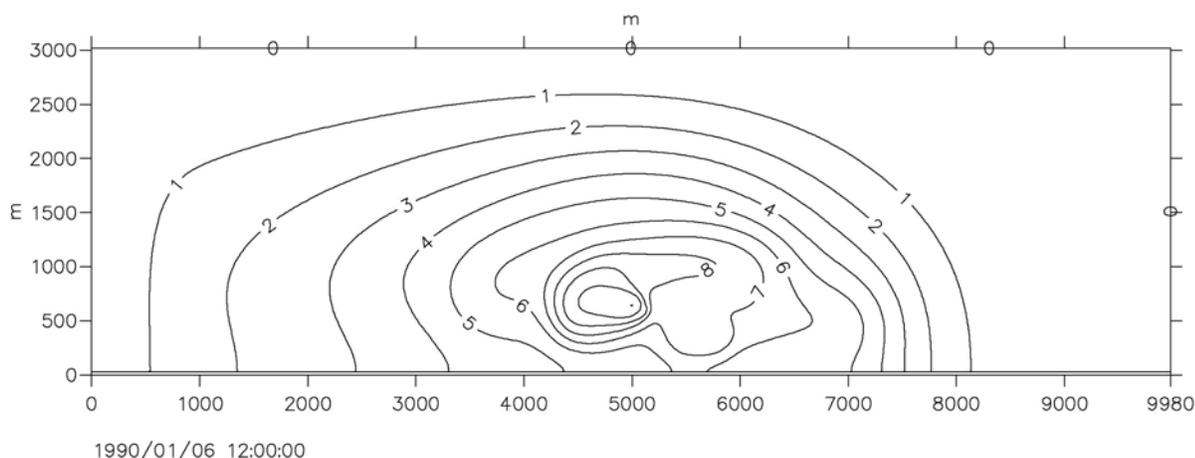
The results obtained by staff are consistent with the measurements conducted on August 10, 1971 by Eliason and Foote (1972). Those measurements indicate that the 4°F temperature isotherm extends about 2,200 ft from the El Segundo discharge, with an area of about 600 acres. These are somewhat smaller than the above predictions.

The difference can be attributed to the fact that Scattergood was only running at 43 percent of capacity, both plants were running at lower loads until 7 hours prior to the survey, and on the definition of the "ambient" temperature used to calculate temperature rises. These 1971 results also contradict the applicant's claim that the 4°F temperature rise isotherm is generally reached within 1,000 ft of the discharge (ESPR 2000aa).

The results of the staff thermal modeling were furnished to the marine biology team for use in their biological impact analysis. See the **Biological Resources** section for a discussion of the cumulative effect of the thermal discharges.

As previously stated, the current NPDES permit requirements are being met for the existing permit conditions, and the numerical results of the staff's cumulative model are not significant for NPDES compliance purposes.

SOIL & WATER RESOURCES FIGURE 2
Calculated Thermal Plume for El Segundo and Scattergood Generating Stations
Temperature Change °F Over Distance



Santa Monica Bay Clean Water Act Section 303(d) Listing

Santa Monica Bay is listed as impaired for several chemical constituents, which may or may not be discharged by the project. Staff reviewed the Bay Keeper analytical data for sampling performed on storm drain outfall No. S10D20. This monitoring data is related to a 24 inch corrugated metal pipe (CMP) located on the southwest corner of the project site that collects off-site runoff that is routed around the project facilities, and that does not receive runoff from the tank farm or other proposed project facilities. The ESPR does not contribute flow from on-site to this stormwater discharge. The final SWPPP for the ESPR project provides adequate mitigation for stormwater impacts, and the ESPR will be required to remain in compliance with all NPDES permit conditions during both construction and operation. No significant cumulative impacts are expected.

Clean Water Act 316(a) and (b)

See the **Biological Resources** section for further discussion and Conditions of Certification for addressing the potentially significant impacts from the ESPR project

related to impingement, entrainment, and entrapment losses associated with once-through cooling. Any additional data obtained as a result of activities discussed in the **Biological Resources** section will be provided to the LARWQCB for consideration for NPDES permit modifications.

ALTERNATIVES ANALYSIS

Once-Through Cooling Using Reclaimed Water

To mitigate potential biological impacts from seawater intakes, staff has evaluated the feasibility of using reclaimed water for once-through cooling and thus eliminating the use of seawater intakes. The reclaimed water from Hyperion TP would be used for the once-through cooling of the Unit 6 generator of the proposed project. The only alternative now being considered is that of using secondary treated cooling water, currently discharged through the Hyperion outfall. Please refer to the **Alternative Cooling Options Appendix** of this FSA for further discussion of this alternative.

Reclaimed Plant Process Water

Staff has evaluated the feasibility of recycled water for purposes where potable water is not required. Based on the most recent process water quality and quantity information available, and the ready availability to ESPR of several grades of reclaimed water (Shoenberger 2001, personal communication), staff has determined that reclaimed water is available for all facility process water needs, excluding fire control, sanitary, and potable uses. The use of reclaimed water for once-through cooling was not a part of this analysis, but is discussed in the **Alternative Cooling Options Appendix** of this FSA.

Water Pipelines

A meeting between the El Segundo Planning Division and members from the West Basin Municipal Water District on Friday April 20, 2001, revealed that the proposed water pipeline route through El Segundo Avenue would be difficult to construct and maintain due to existing underground utility congestion. The City of El Segundo also indicated that Standard, Main and Richmond Streets should be avoided by pipeline construction due to present constraints. ESPR indicates that the Grand Avenue to Eucalyptus to El Segundo path is the one path through the alternate pipeline study area for which they have no objections. As such, the applicant suggests that the Energy Commission permit the project for that path and that path only (Please see the **Land Use** section of this FSA for further discussion of these issues. Potential impacts to soil and water resources related to the pipeline placement will be mitigated by compliance with the General Construction NPDES permit required as a Condition of Certification.

MITIGATION

APPLICANT'S PROPOSED MITIGATION

Erosion and Sediment Control

The applicant has provided a draft Stormwater Pollution Prevention Plan (SWPPP) that identifies temporary and permanent erosion control and stormwater Best Management Practices (BMPs). The applicant has identified a number of potential BMPs for the

construction and operation of the ESPR project (ESPR 2000aa, 2000ab, 2002a, 2002ee).

Erosion and sediment control measures to be used during construction include but are not limited to: silt fence, straw bales, mulches, temporary or permanent geotextiles or aggregate surfacing, dust preventative measures and additional BMPs referenced from the California Stormwater Best Management Practice Handbook for Construction Activity. Additionally, the applicant proposes:

- Stormwater management BMPs
- Non-stormwater management BMPs
- A Waste Management Plan that addresses dewatering procedures regarding the volume of water and how it would be treated to remove hydrocarbons
- Containment for hazardous material delivery and storage areas to prevent spills or leakage of liquid materials from contaminating soil and stormwater
- Storage areas for construction wastes, hazardous materials, paints, and related products along with covered dumpsters and containers for waste and recyclables
- Implementation of a Spill Prevention Containment Contingency plan
- Monitoring programs that include maintenance, inspection, and repair
- Specialized drainage systems such as an oil/water separator to trap oily materials

Water Supply, Cooling and Wastewater Discharge

The following conditions are intended to provide mitigation for potentially significant impacts (ESPR 2000a):

- Owner shall implement and utilize sufficient construction dewatering control methods to ensure dewatering volumes do not impact groundwater conditions.
- Sanitary waste for ESGS shall be directed to a sanitary waste pipeline system and not discharged directly to the ocean.
- Owner intends to utilize maximum volumes of reclaimed water on-site and reduce potable water use to extent practicable.

STAFF'S PROPOSED MITIGATION

Erosion and Sediment Control

Staff finds the applicant's proposed mitigation measures for erosion and stormwater to be inadequate. The following measures should be included in the final SWPPP for the entire site (including the tank farm/proposed berm and off-site linear construction), and are proposed in Conditions of Certification (**Soil and Water 1-4**).

- The Erosion and Sediment Control drawings will include all final proposed and existing on-site/off-site features such as: pipeline construction, laydown (staging) areas, transmission structures, tank farm area/with supporting berm, and soil stockpile location(s) accommodated with the supporting BMPs. The drawings will address the proposed road network around Units 5, 6, and 7, the proposed tank farm/southern berm, public access area, and the proposed Administration building.
- Grading information will include mapping that depicts existing versus proposed contours. Where applicable, the contours should be arranged in two-foot intervals at the minimum.

- Soil use limitations associated with construction and revegetation need to be acknowledged and resolutions should be provided to assist the contractor in overcoming any limitation (refer to the soil survey for specific soils information).
- The limit of construction boundary (on-site and off-site) will include the project facility, all pipeline areas, stockpile areas, pipeline and transmission structures, tank farm/berm and laydown areas. The limit of construction ensures all work is confined to the proposed ESPR project in order to protect all surrounding areas not involved in construction or operation of the proposed project.
- Silt fence and straw bales will be installed on level grade and parallel to the existing contour. Silt fence and straw bales will be used to trap sediment, and not used as runoff conveyance facilities and as inlet protection devices.
- Pipeline excavation will be limited to an area that can be excavated and backfilled within a day. Exposed soil will be stabilized upon backfilling the open trench. Spoil material will not be located near any stormwater inlets and should be hauled to an approved disposal area. Erosion and sediment control drawings need to provide specific BMPs for pipeline construction.
- Stormwater inlets need to be protected from potential sediment-laden runoff. Silt fence is not a recommended BMP facility as it is designed to handle overland and not concentrated flow.
- The applicant has proposed sediment basins within the tank farm area to be constructed out of impermeable material. The sediment basins need to have outlets designed relative to the discharge volumes, and the area receiving the discharge beyond the outlets needs to consist of a conveyance facility designed to handle concentrated discharge from the basins and convey the discharge in a non-erosive manner to appropriate discharge locations. The narrative portion of the SWPPP needs to contain calculations related to the sediment and runoff storage, sediment settling volume, and the discharge associated with the basins. Please note that these basins need to have the calculations based on stormwater and sediment retention.
- Dust suppression methods need to be provided on the drawings and narrative.
- Areas with contaminated soil determined to be hazardous waste will be excavated by personnel who have been trained through the OSHA recommended 40-hour safety program (29 CFR 1910.120) with an approved plan for excavation, control of contaminant releases to the air, water and off-site transport or on-site treatment.
- Stormwater management calculations must be performed in accordance with the LA County Department of Public Works Hydrology Manual. Calculations need to be provided for the proposed roadside swales to demonstrate adequacy for the assumed capacity. Calculations are also needed for any proposed riprap at stormwater outfalls. Also, the stormwater management conveyance system during the construction of the proposed southern berm needs to be uninterrupted during the berm construction. Therefore, drawings and a narrative need to be provided for initial, interim, and final stages of the berm construction activity to demonstrate that all off- and on-site stormwater runoff will be conveyed to the existing 24" CMP (located at the southwestern portion of the tank farm area) without discharging sediment laden runoff.
- Drawings that depict BMPs, swale, and riprap details need to be provided. Instructions for BMP installation also need to appear on the drawings.

- Areas slated to have temporary/permanent slope geotextile protection, should be depicted on the drawings and contain geotextile installation details.
- The 24" CMP located at the southwestern portion of the tank farm/berm needs to discharge "clean" runoff.

Site Drainage

The ESPR is required to comply with the stormwater requirements of the RWQCB and the Standard Urban Stormwater Mitigation Plans (SUSMP). The City of El Segundo has the responsibility to implement the SUSMP requirements, along with the RWQCB. Conditions of Certification (**Soil and Water 1-4**) were prepared to ensure that the permit requirements will be met.

Water Supply, Cooling and Wastewater Discharge

Staff is recommending the following mitigation to address potentially significant impacts from cooling water and wastewater discharges and LORS compliance issues.

- The proposed project design and operational plan does not appear to be consistent with LORS related to reclaimed water use. To address this inconsistency, staff has recommended a Condition of Certification requiring the use of reclaimed water for all purposes except sanitary, potable, and fire control uses.
- Develop and implement a sampling and analysis program for each waste stream prior to mixing with any other. See Condition of Certification **Soil and Water 7**.

FACILITY CLOSURE

The ESPR project is expected to operate approximately 30 years. Closure options range from "mothballing," with the intent of a restart at some time, to the removal of all equipment and facilities. The "mothballing" state is a temporary closure. The facility would be able to restart operations upon cessation of the temporary closure. Permanent closure is a planned closure that is conducted as a gradual process usually at the end of the power facility life or due to technological issues.

At the time of the ESPR facility closure, a closure plan would be submitted to the Energy Commission for approval prior to decommissioning. Compliance with all applicable LORS, and any local and/or regional plans would be required. The plan will address all concerns in regard to potential soil and water quality issues (ESPR 2000a).

COMPLIANCE WITH LORS

The ESPR is expected to comply with the provisions of the Clean Water Act that regulate discharges through the National Pollutant Discharge Elimination System (NPDES). Based on correspondence from the LARWQCB, the Outfall No. 001 and 002 would be considered an "existing" discharge under the Thermal Plan. Therefore, the project is currently in compliance with the existing NPDES permit. See proposed Condition for Certification **Soil and Water 5** for NPDES permit requirements.

Staff finds that ESPR has not demonstrated conformance with California Water Code section 13550, which requires the use of reclaimed water where available, SWRCB

Policy 75-58, or Article 10, section 2 of the California Constitution. Staff has determined that it is feasible for ESPR to use reclaimed water in place of potable water for all process and inlet cooling purposes, with the exception of potable, sanitary, and fire control. The use of potable water for nonpotable uses when recycled water is available may be considered a waste and unreasonable use of water according to Article 10, Section 2 of the California Constitution.

The Energy Commission siting regulations contain several requirements with regard to use of water and compliance with LORS that are intended to guide and assist staff in the evaluation of projects. Title 20, California Code of Regulations, Division 2, Chapter 5, Article 6, contains specific requirements in Appendix B.

- Appendix B(g)(14)(C)(i), requires, in part, a description of the source of the water to be used and the rationale for its selection, and if fresh water is to be used for power plant cooling purposes, a discussion of all other potential sources and an explanation why these sources were not feasible.
- Appendix B(h)(1)(A) requires, in part, the identification of laws, regulations, ordinances, standards, adopted local, regional, state, and federal land use plans, and permits applicable to the proposed project, and a discussion of the applicability of each.
- Appendix B(h)(2) requires a discussion of the conformity of the project with the requirements listed in subsection (h)(1)(A).

The information provided by ESPR in the AFC and in response to subsequent staff data requests regarding the basis for the selection and use of water has not demonstrated conformity of the project with applicable LORS.

Staff has determined that it is practicable for ESPR to use readily available recycled water from the WBMWD for all process and inlet cooling water uses. Staff has proposed a Condition of Certification to ensure ESPR consistency with these LORS.

CONCLUSIONS AND RECOMMENDATIONS

EROSION AND SEDIMENT CONTROL

Erosion and sediment control involving the site preparation, demolition of retired units, construction, and operation of ESPR will not result in significant adverse impacts to the soil and water resources if the mitigation measures and Conditions of Certification proposed by staff are required and implemented.

SITE DRAINAGE

Existing soil and water point source and regional contamination are present on and beneath the site that could cause potentially significant adverse impacts during excavation and drainage construction activities. These impacts will be mitigated to below a level of significance by implementation of staff's proposed mitigation and Conditions of Certification.

WATER SUPPLY AND COOLING AND WASTE WATER DISCHARGE

The current NPDES Permit has been approved by the LARWQCB for current operating conditions and for pre- and post-construction stormwater runoff conditions (LARWQCB Letter dated May 31, 2001). Additional monitoring or waste discharge requirements may be required, particularly with regard to future requirements related to the California Toxics Rule and Total Maximum Daily Loads (TMDLs). Compliance with the operational and construction NPDES permits, the recommended Conditions of Certification, and staff's proposed mitigation will ensure that potential significant impacts to soil and water resources from the ESPR do not occur.

Staff finds that ESPR has not demonstrated conformance with California Water Code section 13550, which requires the use of reclaimed water where available, SWRCB Policy 75-58, or Article 10, section 2 of the California Constitution. Adequate variety, volume, and accessibility of reclaimed water supplies have been identified in close proximity to the project. The project's preference to use potable water for nonpotable uses when reclaimed water is both available and feasible for these purposes may be considered a waste and unreasonable use of fresh water according to Article 10, Section 2 of the California Constitution. To ensure that the project conforms with LORS, staff has recommended a Condition of Certification requiring the use of reclaimed water for all purposes except sanitary, potable, and fire control water uses.

SIGNIFICANT IMPACTS AND LORS COMPLIANCE

The proposed ESPR project will comply with applicable LORS and avoid unmitigated significant impacts if the Conditions of Certification recommended by staff are required. Staff recommends that the project not be licensed without these Conditions of Certification included as part of the license.

CONDITIONS OF CERTIFICATION

Some of the Conditions of Certification in this section have been changed from the PSA based on staff's efforts to standardize Conditions of Certification to the extent feasible based on recent experience in the certification and compliance process. These changes do not affect the substance of the requirements in the Condition. Other Conditions have been changed based on stipulated agreements between staff and the applicant. All of the modified Conditions are supported by the analysis outlined in the text above.

SOIL & WATER 1: Prior to site mobilization, demolition, and/or construction related ground disturbance activities, including linear facilities, the project owner shall develop a Storm Water Pollution Prevention Plan (SWPPP) for the project as required under the NPDES General Stormwater Construction Activity Permit. A copy of the SWPPP and the Notice of Intent (NOI) submitted to the LARWQCB as required under the NPDES General Stormwater Construction Activity Permit regulations shall be provided to the CPM for review and approval. The SWPPP shall include the actual drainage and facility design for all on- and off-site ESPR project facilities for construction, and shall address all issues detailed in the Staff Recommended Mitigation section of this FSA. The SWPPP shall demonstrate compliance with all applicable SUSUMP requirements. The project owner shall

submit the construction SWPPP to the City of El Segundo for review and comment, and provide the CPM with a copy of a transmittal letter that requests the City provide copies of their comments to both ESPR and to the CPM.

Verification: Sixty days prior to the start of any site mobilization activities and/or ground disturbing activities associated with demolition or construction of the project (including demolition of tanks or Units 1 and 2) or any linear element, the project owner shall submit copies of the construction SWPPP, the NOI, and the transmittal letter to the CPM for review and approval. The SWPPP must be approved, and the transmittal letter and NOI copies received by the CPM prior to the start of site mobilization activities.

SOIL & WATER 2: Prior to site mobilization, demolition, and/or construction related ground disturbance activities, including linear facilities, the project owner shall develop an Erosion and Sedimentation Control Plan (ESCP) for the construction phase of the project. A copy of the ESCP for construction shall be provided to the CPM for review and approval. The ESCP shall address the actual drainage and facility design for all on- and off-site ESPR project facilities for construction, and shall address all issues detailed in the Staff Recommended Mitigation section of this FSA. The ESCP shall demonstrate compliance with all applicable SUSUMP requirements. The project owner shall submit the construction ESCP to the City of El Segundo for review and comment, and provide the CPM with a copy of a transmittal letter that requests the City provide copies of their comments to both ESPR and to the CPM.

Verification: Sixty days prior to the start of any site mobilization activities and/or ground disturbing activities associated with demolition or construction of the project or any linear element, the project owner shall submit the ESCP and a copy of the transmittal letter to the CPM for review and approval. The ESCP must be approved, and the transmittal letter received by the CPM prior to the start of site mobilization activities.

SOIL & WATER 3: Prior to power plant operation the owner shall develop a SWPPP as required under the NPDES stormwater discharge permit for operation of the project. The SWPPP shall include the actual drainage and facility design for all on- and off-site ESPR project and linear facilities showing the details of the stormwater and sediment run-off and run-on to the ESPR project facilities during operation. The SWPPP shall address all issues detailed in the Staff Recommended Mitigation section of this FSA. This plan shall document that the existing and proposed project stormwater facilities have adequate capacity as required by the City of El Segundo. The SWPPP shall be consistent with all other permit and design documents, and shall demonstrate compliance with all applicable SUSUMP requirements. The project owner shall include in this plan the installation of secondary containment for the entire site, excluding off-site and linear facilities. The containment design shall have design documentation and specifications for the berms or other walled structures. The project owner shall submit the operational SWPPP to the City of El Segundo for review and comment, and provide the CPM with a copy of a transmittal letter that requests the City provide copies of their comments to both ESPR and to the CPM. The

operational SWPPP shall be approved, and the transmittal letter received by the CPM prior to the start of operation.

Verification: Sixty days prior to the start of operation the project owner shall submit copies of the SWPPP and the transmittal letter to the CPM for review and approval. The SWPPP must be approved, and the transmittal letter received by the CPM prior to power plant operation.

SOIL & WATER 4: Prior to power plant operation the owner shall develop an Erosion and Sedimentation Control Plan (ESCP) for the operational phase of the project. The ESCP shall include the actual drainage and facility design for all on- and off-site ESPR project and linear facilities showing all of the details of stormwater and sediment run-off and run-on to the ESPR project facilities during operation. The ESCP shall address all issues detailed in the Staff Recommended Mitigation section of this FSA. The SWPPP shall be consistent with all other permit and design documents, and shall demonstrate compliance with all applicable SUSUMP requirements. The project owner shall include in this plan the installation of secondary containment for the entire site, excluding off-site and linear facilities. The containment design shall have design documentation and specifications for the berms or other walled structures. The project owner shall submit the operational ESCP to the City of El Segundo for review and comment, and provide the CPM with a copy of a transmittal letter that requests the City provide copies of their comments to both ESPR and to the CPM. The operational ESCP shall be approved, and the transmittal letter received by the CPM prior to the start of operation.

Verification: Sixty days prior to the start of operation the project owner shall submit a copies of the ESCP and the transmittal letter to the CPM for review and approval. The ESCP must be approved, and the transmittal letter received by the CPM prior to power plant operation.

SOIL & WATER 5: The project owner shall maintain in effect the National Pollutant Discharge Elimination System (NPDES) Permit from the LARWQCB for the life of the ESPR project. The project owner shall comply with all provisions of the NPDES Permit, and shall notify the CPM of any proposed or actual changes made to this permit and provide copies of materials related to permit amendment, modification, and renewal, and of any changes to the project design or operational plan necessary to comply with the NPDES permit changes. All NPDES compliance monitoring reports submitted to the LARWQCB, permit violations, and enforcement actions shall be reported and discussed in the annual Compliance Report to the CPM. All NPDES enforcement actions against the project shall be reported to the CPM by letter within 30-days of the project being notified by LARWQCB. The project shall not operate without the NPDES permit in place.

Verification: Within 30 days following receipt of a new, amended, or modified NPDES Permit from the LARWQCB, the project owner shall submit a copy of the new permit to the CPM. The Annual Compliance report shall include a copy of NPDES compliance monitoring reports submitted to the LARWQCB, notices of violations, and discussion of enforcement actions taken against the project owner. The CPM shall be notified by letter of NPDES permit enforcement actions within 30-days of the project

being notified by the LARWQCB. The project owner shall notify the CPM in writing of any changes made to this permit, and of any changes to the project design or operational plan necessary to comply with NPDES permit revisions.

SOIL & WATER 6: The project owner shall use reclaimed water for all in-plant process water needs. Specifically excepted from using reclaimed water are fire control supply water, sanitary water, and potable water. The project owner shall submit a Reclaimed Water Use Plan (RWUP) that includes a detailed revised project design, operational plan, and water balance for the use of reclaimed water for review and approval by the CPM prior to the start of any site mobilization activities for the project or any linear element. This RWUP shall be consistent with all applicable LORS, including Title 22 California Code of Regulations. Site mobilization activities shall not begin without a CPM approved RWUP.

Verification: The project owner shall submit the RWUP to the CPM for review and approval sixty days prior to the start of any site mobilization activities associated with the project or any linear elements. The RWUP must be approved by the CPM before the start of site mobilization.

SOIL & WATER 7: Within 120 days after the project begins operating, samples shall be collected and analyzed for organic and inorganic chemical constituents from each waste stream prior to mixing with any other waste stream. These samples shall be collected and analyzed in a manner consistent with the discharger monitoring requirements of the NPDES permit. The analytical method used for metals and trace element analyses shall have detection limits comparable with USEPA Method 200.8 (ICP-MS). All metals and trace elements shall be reported along with applicable detection limits for each analyte. Samples shall be obtained at a time when the plant has been operating at a level of at least 75% of capacity over a 24-hour period, and the operating capacity and time at that operating capacity will be reported at the time of sampling. The chemical analytical data and volume of flow data shall be provided for all in-plant wastewater streams, the combined in-plant wastewater stream prior to discharge to the retention basin, the water contained in the retention basin, and in the wastewater discharge from the retention basin prior to mixing with cooling water flows. Analysis shall include all constituents for which Santa Monica Bay is listed as impaired under CWA 303(d).

Verification: A report summarizing the analytical results and flows for each in-plant waste stream, the combined wastewater stream prior to discharge to the retention basin, the retention basin water, and the discharge from the retention basin prior to mixing with cooling water flow shall be provided to the CPM. The samples shall be collected within 120 days after the project begins operating, and the results reported to the CPM for review within 150 days of the start of commercial operation. Following the initial sampling event report, these data shall be supplied to the CPM in the Annual Compliance Report.

SOIL & WATER 8: The project owner shall record on a monthly basis, the amount of reclaimed and potable/fresh water used by the project. This information shall be supplied to the CPM in the Annual Compliance Report. The annual summary shall include the monthly range, monthly average, and total amounts of reclaimed

and potable/freshwater water used by the project in both gallons-per-minute and acre-feet. Following the first year of operation, the annual summary will also include the yearly range and yearly average of reclaimed and potable/fresh water used by the project.

Verification: The project owner shall submit the required water use summary to the CPM for review as part of the Annual Compliance Report for the life of the project.

SOIL & WATER 9: Reclaimed water may be unavailable at times due to upsets or equipment failures at the West Basin Municipal Water District (WBMWD). The project owner shall provide a detailed contingency plan for the use of an alternate reclaimed or other water source when reclaimed water is unavailable. The plan shall assume a reasonable unavailability of reclaim water set at 5 percent, or 18 days per year. The plan shall further provide for the contingency that the failure rate could exceed 5 percent. The project owner shall include a detailed summary of all WBMWD reclaimed water delivery failures in the Annual Compliance Report. Commercial operation shall not commence without a CPM approved plan.

Verification: The project shall provide the recycled water unavailability contingency plan for CPM review and approval 60 days prior to the start of commercial operation. The project owner shall include the recycled water unavailability reporting information in the Annual Compliance Report for CPM review for the life of the project. The recycled water contingency plan must be approved by the CPM prior to operation.

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WORKER SAFETY AND FIRE PROTECTION

Testimony of Alvin J. Greenberg, Ph.D. and Rick Tyler

INTRODUCTION

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

The purpose of this Staff Assessment is to assess the worker safety and fire protection measures proposed by the El Segundo Power Redevelopment (ESPR) Project and to determine whether the applicant has proposed adequate measures to:

- comply with applicable safety LORS;
- protect the workers during demolition, construction and operation of the facility;
- protect against fire; and
- provide adequate emergency response procedures.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)

FEDERAL

In December 1970 Congress enacted Public Law 91-596, the Federal Occupational Safety and Health Act (OSH Act) of 1970. This Act mandates safety requirements in the workplace and is found in Title 29 of the United States Code, § 651 (29 U.S.C. §§ 651 through 678). Implementing regulations are codified at Title 29 of the Code of Federal Regulations, under General Industry Standards §§ 1910.1 - 1910.1500 and clearly define the procedures for promulgating regulations and conducting inspections to implement and enforce safety and health procedures to protect workers, particularly in the industrial sector. Most of the general industry safety and health standards now in force under this OSH Act represent a compilation of materials from existing federal standards and national consensus standards. These include standards from the voluntary membership organizations of the American National Standards Institute (ANSI) and the National Fire Protection Association (NFPA), which publishes the National Fire Codes.

The purpose of the Occupational Safety and Health Act is to “assure so far as possible every working man and woman in the nation safe and healthful working conditions and to preserve our human resources” (29 USC § 651). The Federal Department of Labor promulgates and enforces safety and health standards that are applicable to all businesses affecting interstate commerce. The Department of Labor established the

Occupational Safety and Health Administration (OSHA) in 1971 to discharge the responsibilities assigned by the OSH Act.

Applicable Federal requirements include:

- 29 U.S. Code § 651 et seq. (Occupational Safety and Health Act of 1970);
- 29 CFR §1910.1 - 1910.1500 (Occupational Safety and Health Administration Safety and Health Regulations);
- 29 CFR §1952.170 – 1952.175 (Federal approval of California’s plan for enforcement of its own Safety and Health requirements, in lieu of most of the Federal requirements found in 29 CFR §1910.1 – 1910.1500).

STATE

California passed the Occupational Safety and Health Act of 1973 (“Cal/OSHA”) as published in the California Labor Code § 6300. Regulations promulgated as a result of the Act are codified at Title 8 of the California Code of Regulations, beginning with §337-560 and continuing with §1514 through 8568. The California Labor Code requires that the Cal/OSHA Standards Board adopt standards at least as effective as the federal standards (Labor Code § 142.3(a)) and thus all Cal/OSHA health and safety standards meet or exceed the Federal requirements. Hence, California obtained federal approval of its State health and safety regulations, in lieu of the federal requirements published at 29 CFR §1910.1 - 1910.1500. The Federal Secretary of Labor, however, continually oversees California’s program and will enforce any federal standard for which the State has not adopted a Cal/OSHA counterpart.

The State of California Department of Industrial Relations is charged with responsibility for administering the Cal/OSHA plan. The Department of Industrial Relations is further split into six divisions to oversee, among other activities: industrial accidents, occupational safety and health, labor standards enforcement, statistics and research, and the State Compensation Insurance Fund (workers compensation).

Employers are responsible for informing their employees about workplace hazards, potential exposure and the work environment (Labor Code § 6408). Cal/OSHA’s principal tool in ensuring that workers and the public are informed is the Hazard Communication standard first adopted in 1981 (8 CCR §5194). This regulation was promulgated in response to California’s Hazardous Substances Information and Training Act of 1980. It was later revised to mirror the Federal Hazard Communication Standard (29 CFR §1910.1200) that established on the federal level an employee’s “right to know” about chemical hazards in the workplace, but added the provision of applicability to public sector employers. A major component of this regulation is the required provision of Material Safety Data Sheets (MSDSs) to workers. MSDSs provide information on the identity, toxicity, and precautions to take when using or handling hazardous materials in the workplace.

Finally, 8 CCR §3203 requires that employers establish and maintain a written Injury and Illness Prevent Program to identify workplace hazards and communicate them to its employees through a formal employee-training program.

Applicable State requirements include:

- 8 CCR §339 - List of hazardous chemicals relating to the Hazardous Substance Information and Training Act;
- 8 CCR §337, et seq. - Cal/OSHA regulations;
- 24 CCR § 3, et seq. - incorporates the current edition of the Uniform Building Code;
- Health and Safety Code § 25500, et seq. - Risk Management Plan requirements for threshold quantity of listed acutely hazardous materials at the facility;
- Health and Safety Code § 25500 - 25541 - Hazardous Material Business Plan detailing emergency response plans for hazardous materials emergency at the facility.

LOCAL

The California Building Standards Code published at Title 24 of the California Code of Regulations § 3 et seq. is comprised of eleven parts containing the building design and construction requirements relating to fire and life safety and structural safety. The California Building Standards Code includes the electrical, mechanical, energy, and fire codes applicable to the project. Local planning/building & safety departments enforce this Code.

National Fire Protection Association (NFPA) standards are published in the California Fire Code. The fire code contains general provisions for fire safety, including but not restricted to: 1) required road and building access; 2) water supplies; 3) installation of fire protection and life safety systems; 4) fire-resistive construction; 5) general fire safety precautions; 6) storage of combustible materials; 7) exits and emergency escapes; and 8) fire alarm systems. The California Fire Code reflects the body of regulations published at Part 9 of Title 24 (H&S Code §18901 et seq.) pertaining to the California Fire Code.

Similarly, the Uniform Fire Code (UFC) Standards, a companion publication to the California Fire Code, contains standards of the American Society for Testing and Materials and the NFPA. It is the United State's premier model fire code. It is updated annually as a supplement and published every third year by the International Fire Code Institute to include all approved code changes in a new edition. The City of El Segundo adopted the 1998 Uniform Fire Code in July 1998. The City of El Segundo Fire Department administers the UFC.

Applicable local (or locally enforced) requirements include:

- 1998 Edition of California Fire Code and all applicable NFPA standards (24 CCR Part 9);
- California Building Code Title 24, California Code of Regulations (24 CCR § 3, et seq.); and
- Uniform Fire Code, 1998.

SETTING

The proposed project is located in the City of El Segundo in Los Angeles County.

The El Segundo Power Redevelopment (ESPR) Project involves demolition of the existing power blocks of Units 1 and 2 and subsequent construction and operation of a combined cycle natural gas fired cogeneration facility with ancillary facilities including pipelines.

Fire support services to the site will be under the jurisdiction of the City of El Segundo Fire Department. Fire Station No. 1 is the closest station to the site and is located at 314 Main Street. The response time to the project site is estimated to be less than 3-5 minutes. Station 2 is located at 2161 El Segundo Boulevard, with an estimated response time of 4-5 minutes (ESFD 2001).

Station 1 is also assigned as the off-site hazardous materials (hazmat) first responder for the El Segundo Power Plant. Station 1 has two designated hazmat personnel and is equipped with a hazmat engine. Station 1 firemen are also hazmat trained (ESFD 2001).

IMPACTS

WORKER SAFETY

Industrial environments are potentially dangerous during demolition, construction and operation of facilities. Workers at the proposed project will be exposed to loud noises, moving equipment, trenches, and confined space entry and egress problems. The workers may experience falls, trips, burns, lacerations, and numerous other injuries. They have the potential to be exposed to falling equipment or structures, chemical spills, hazardous waste, fires, explosions, and electrical sparks and electrocution. It is important for the El Segundo Power Redevelopment project to have well-defined policies and procedures, training, and hazard recognition and control at their facility to minimize such hazards and protect workers. If the facility complies with all LORS, workers will be adequately protected from health and safety hazards.

A unique proposal made by the applicant at the May 2, 2001 workshop involves the use of one of the former oil storage tanks as an on-site indoor work area to minimize noise impacts to the surrounding community. On a subsequent site visit on February 21, 2002, the applicant stated that it was withdrawing the concept of having workers inside the abandoned tanks. Instead, the tanks are proposed for use as a storage area for clean soils removed from the site during site preparation (ESPR 2002). Only earth-moving equipment and one driver will enter the tanks. No other workers will be in the tanks and the equipment operator will not leave the vehicle. In order to ensure protection of the health and safety of these workers, staff has recommended additional mitigation beyond the LORS listed above.

FIRE HAZARDS

During demolition, construction and operation of the proposed El Segundo Power Redevelopment project there is the potential for both small fires and major structural fires. Electrical sparks, combustion of fuel oil, natural gas or flammable liquids, explosions, and over-heated equipment may cause small fires. Major structural fires may develop from uncontrolled fires or be caused by large explosions of natural gas or other flammable gasses or liquids. Compliance with all LORS will be adequate to assure protection from all fire hazards.

CUMULATIVE IMPACTS

Staff reviewed the potential for the demolition, construction and operation of El Segundo Power Redevelopment project, combined with existing industrial facilities, to result in impacts on the fire and emergency service capabilities of the City of El Segundo Fire Department and found that cumulative impacts were insignificant.

APPLICANT'S PROPOSED MITIGATION

WORKER SAFETY

A Safety and Health Program will be prepared by the applicant to minimize worker hazards during demolition, construction and operation. Staff uses the phrase "Safety and Health Program" to refer to the measures that will be taken to ensure compliance with the applicable LORS during the demolition, construction and operational phases of the project.

Demolition & Construction Safety and Health Program

The El Segundo Power Redevelopment project encompasses demolition of existing power blocks of Units 1 and 2 and construction and operation of a natural gas fired facility with ancillary facilities such as transmission lines and pipelines. Workers will be exposed to hazards typical of demolition, construction and operation of a gas-fired combined cycle facility.

Construction Safety Orders are published at 8 CCR § 1502, et seq. These requirements are promulgated by Cal/OSHA and are applicable to the demolition and construction phases of the project. The Construction Safety and Health Program will include the following:

- Construction Injury and Illness Prevention Program (8 CCR § 1509);
- Construction Fire Protection and Prevention Plan (8 CCR § 1920); and
- Personal Protective Equipment Program (8 CCR §§ 1514 to 1522).

Additional programs under General Industry Safety Orders (8 CCR §§ 3200 to 6184), Electrical Safety Orders (8 CCR §§ 2299 to 2974) and Unfired Pressure Vessel Safety Orders (8 CCR §§ 450 to 544) will include:

- Electrical Safety Program;
- Unfired Pressure Vessel Safety Orders;

- Equipment Safety Program;
- Forklift Operation Program;
- Excavation/Trenching Program;
- Fall Prevention Program;
- Scaffolding/Ladder Safety Program;
- Articulating Boom Platforms Program;
- Crane and Material Handling Program;
- Housekeeping and Material Handling and Storage Program;
- Hot Work Safety Program;
- Respiratory Protection Program;
- Employee Exposure Monitoring Program;
- Confined Space Entry Program;
- Hand and Portable Power Tool Safety Program;
- Hearing Conservation Program;
- Back Injury Prevention Program;
- Hazard Communication Program;
- Air Monitoring Program;
- Heat and Cold Stress Monitoring and Control Program; and
- Pressure Vessel and Pipeline Safety Program.

The AFC includes adequate outlines of each of the above programs. Prior to the demolition of existing power blocks of Units 1 and 2 and construction of the El Segundo Power Redevelopment project, detailed programs and plans will be provided pursuant to the condition of certification **WORKER SAFETY-1**.

Operations and Maintenance Safety and Health Program

Upon completion of construction and prior to operations at the El Segundo Power Redevelopment project, the Operations and Maintenance Safety and Health Program will be prepared. This operational safety program will include the following programs and plans:

- Injury and Illness Prevention Program (8 CCR § 3203);
- Emergency Action Plan (8 CCR § 3220);
- Hazardous Materials Management Program;
- Operations and Maintenance Safety Program;
- Fire Protection and Prevention Program (8 CCR § 3221); and
- Personal Protective Equipment Program (8 CCR §§ 3401-3411).

In addition, the requirements under General Industry Safety Orders (8 CCR §§ 3200 to 6184), Electrical Safety Orders (8 CCR §§ 2299 to 2974) and Unfired Pressure Vessel Safety Orders (8 CCR §§ 450 to 544) will be applicable to the project. Written safety programs, which the applicant will develop, for the El Segundo Power Redevelopment project will ensure compliance with the above-mentioned requirements.

The AFC includes an adequate outline of the Emergency Action Plan (AFC Table 5.17-4). Prior to operation of the El Segundo Power Redevelopment project, all detailed

programs and plans will be provided pursuant to condition of certification **WORKER SAFETY-2**.

Safety and Health Program Elements

The Applicant provided the proposed outlines for both a Demolition & Construction Safety and Health Program and an Operation Safety and Health Program. The measures in these plans are derived from applicable sections of state and federal law. The major items required in both Safety and Health Programs are as follows:

Injury and Illness Prevention Program (IIPP)

The Applicant will submit an expanded Demolition, Construction and Operations Illness and Injury Prevention Program to Cal/OSHA for review and comment 30 days prior to demolition, construction and operation of the project.

The IIPP will include the following components as presented in the AFC:

- The Identity of person(s) with authority and responsibility for implementing the program;
- a System ensuring employees comply with safe and healthy work practices;
- a System facilitating employer-employee communications;
- Procedures identifying and evaluating workplace hazards, including inspections to identify hazards and unsafe conditions;
- Methods for correcting unhealthy/unsafe conditions in a timely manner;
- Methods of documenting inspections and training and for maintaining records; and

- A training program for:
 - introducing the program;
 - new, transferred, or promoted employees;
 - new processes and equipment;
 - supervisors;
 - contractors.

Emergency Action Plan

California regulations require an Emergency Action Plan (8 CCR § 3220). The AFC contains a satisfactory outline for an emergency action plan (Table 5.17-4).

The outline lists the following features:

- Purpose and Scope of Emergency Action Plan;
- Personnel Responsibilities during Emergencies;
- Specific Response Procedures;
- Evacuation Plan;
- Emergency Equipment Locations;
- Fire Extinguisher Locations;
- Site Security;
- Accident Reporting and Investigation;
- Lockout/Tagout;

- Hazard Communication;
- Spill Containment and Reporting;
- First Aid and Medical Response;
- Respiratory Protection;
- Personal Protective Equipment;
- Sanitation; and
- Work Site Inspections.

Fire Prevention Plan

California Code of Regulations requires an Operations Fire Prevention Plan (8 CCR § 3221). The AFC describes a proposed fire prevention plan which is acceptable to staff. The plan will include the following topics:

- Responsibilities;
- Procedures for fire control;
- Fixed and portable fire-fighting equipment;
- Housekeeping;
- Employee alarm/communication practices;
- Servicing and refueling areas;
- Training; and
- Flammable and combustible liquid storage.

Staff proposes that the Applicant submit a final Fire Protection and Prevention Plan to the California Energy Commission Compliance Project Manager (CPM) for review and approval and to the City of El Segundo Fire Department for review and comment to satisfy proposed conditions of certification **WORKER SAFETY 1** and **2**.

Personal Protective Equipment Program

California regulations require Personal Protective Equipment (PPE) and first aid supplies whenever hazards are encountered which, due to process, environment, chemicals or mechanical irritants can cause injury or impair bodily function as a result of absorption, inhalation or physical contact (8 CCR § 3380-3400). The El Segundo Power Redevelopment project operational environment will likely require PPE.

Information provided in the AFC indicates that all employees required to use PPE will be checked for proper fit and to see if they are medically capable of wearing the equipment. All safety equipment will meet NIOSH or ANSI standards and will carry markings, numbers, or certificates of approval. Respirators will meet NIOSH and California Department of Health Services Standards. Each employee will be provided with the following information pertaining to the protective clothing and equipment:

- Proper use, maintenance, and storage;
- When the protective clothing and equipment are to be used;
- Benefits and limitations; and
- When and how the protective clothing and equipment are to be replaced.

The PPE Program ensures that employers comply with the applicable requirements for PPE and provide employees with the information and training necessary to implement the program.

Operations and Maintenance Written Safety Program

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

- Fall Protection Program;
- Hot Work Safety Program;
- Confined Space Entry;
- Hearing Conservation Program;
- Hazard Communication Program;
- Process Safety Management (PSM) Program; and
- Contractor Safety Program.

Operations and Maintenance Safety Training Programs

Employees will be trained in the safe work practices described in the above-reference safety programs.

FIRE PROTECTION

Staff reviewed the information provided in the AFC regarding available fire protection services and equipment (AFC Section 5.17, Worker Safety) to determine if the project would adequately protect workers and if it would affect the fire protection services in the area. The project will rely on both onsite fire protection systems and local fire protection services. The onsite fire protection system provides the first line of defense for small fires. In the event of a major fire, fire support services including trained firefighters and equipment for a sustained response would be required from the City of El Segundo Fire Department.

During demolition and construction an interim fire protection system will be in place. The permanent facility fire protection system will be placed in service as early as possible during the demolition and construction phase.

The information in the AFC indicates that the project intends to meet the minimum fire protection and suppression requirements. Elements include both fixed and portable fire extinguishing systems.

The existing fire water supply is to be upgraded as part of the project. The interim fire protection system will include mobile fractionation tanks to store firewater and a firewater pump. As backup to the interim system, the facility will rely on existing 6-inch water mains from the city water systems of El Segundo and Manhattan Beach. Upon project completion, two sources of firewater will be available: the primary source will be either a new tank or the existing fire/service water storage tank relocated to a new site and the secondary source will be the new water main line from the City of El Segundo.

This fire water supply and an on-site electric fire-water pumping system (with diesel generator back-up) will provide more than an adequate quantity of fire-fighting water to yard hydrants, hose stations, and water spray and sprinkler systems. The motor driven fire pump will be capable of supplying maximum water demand for any automatic sprinkler system plus water for fire hydrants and hose stations.

A carbon dioxide fire protection system will be provided for the combustion turbine generator (CTG) and accessory equipment. Fire detection sensors will also be installed.

A deluge spray system will be provided for the generator transformers and auxiliary power transformer in the event of a fire. Deluge water is fed from the firewater storage and supply system.

Fire hydrants and hose stations will supplement the plant fire protection system using water from the plant underground fire water/domestic water system. Fire hydrants with hose houses will be placed at approximately 250-foot intervals around the new fire loop; hydrants will be located and hose houses equipped in accordance with NFPA 24 and local fire codes.

In addition to the fixed fire protection system, smoke detectors, combustible gas detectors, and appropriate class of service portable extinguishers will be located throughout the facility at code-approved intervals.

The applicant will be required to provide the final Fire Protection and Prevention Program to staff and to the City of El Segundo Fire Department, prior to demolition, construction and operation of the project, to confirm the adequacy and approve the proposed fire protection measures.

FACILITY CLOSURE

The project owner/operator is responsible for maintaining an operational fire protection system during closure activities. The project must also stay in compliance with all applicable health and safety LORS during that time. A facility closure plan will be developed prior to closure to incorporate these requirements.

CONCLUSION AND RECOMMENDATIONS

If the Applicant for the proposed El Segundo Power Redevelopment project provides a Project Demolition & Construction Injury and Illness Prevention Program and a Project Operations Safety and Health Program as required by conditions of certification **WORKER SAFETY -1** and **-2**, staff believes that the project will incorporate sufficient measures to ensure adequate levels of industrial safety, and comply with applicable LORS. Staff also concludes that the proposed project will not have significant impacts on local fire protection services. The proposed facility is located within an existing power plant facility that is currently served by the local fire department. The fire risks are similar to those of the existing facility and thus pose no new or added demands on local fire protection services. In order to ensure that workers who operate the earth-

moving equipment when placing or removing clean soils stored in the empty oil storage tanks are adequately protected, staff has proposed condition of certification **WORKER SAFETY 3**.

If the Commission certifies the project, staff recommends that the Commission adopt the following proposed conditions of certification. The proposed conditions of certification provide assurance that the Demolition and Construction Injury and Illness Prevention Program and the Operations Safety and Health Program proposed by the applicant will be reviewed by the appropriate agencies before implementation. The conditions also require verification that the proposed plans adequately assure worker safety and fire protection and comply with applicable LORS.

PROPOSED CONDITIONS OF CERTIFICATION

WORKER SAFETY-1 The project owner shall submit to the Compliance Project Manager (CPM) for approval, a copy of the Project Demolition and Construction Safety and Health Program containing the following:

- A Demolition and Construction Injury and Illness Prevention Program;
- A Demolition and Construction Personal Protective Equipment Program;
- A Demolition and Construction Exposure Monitoring Program;
- A Demolition and Construction Emergency Action Plan; and
- A Demolition and Construction Fire Protection and Prevention Plan.

The Injury and Illness Prevention Program, the Personal Protective Equipment Program, and the Exposure Monitoring Program shall be submitted to the CPM for review and comment concerning compliance of the program with all applicable Safety Orders. The Demolition and Construction Fire Protection and Prevention Plan and Emergency Action Plan shall be submitted to the City of El Segundo Fire Department for review and comment prior to submittal to the CPM.

Verification: At least 30 days prior to the start of demolition, the project owner shall submit to the CPM for review and approval a copy of the Project Demolition and Construction Safety and Health Program. The project owner shall provide a letter from the City of El Segundo Fire Department stating that they have reviewed and commented on the Demolition and Construction Fire Protection and Prevention Plan and Emergency Action Plan.

WORKER SAFETY-2 The project owner shall submit to the CPM for approval a copy of the Project Operations and Maintenance Safety and Health Program containing the following:

- An Operation Injury and Illness Prevention Plan;
- An Emergency Action Plan;
- Hazardous Materials Management Program;
- Fire Protection and Prevention Program (8 CCR § 3221); and;
- Personal Protective Equipment Program (8 CCR §§ 3401-3411).

The Operation Injury and Illness Prevention Plan, Emergency Action Plan, and Personal Protective Equipment Program shall be submitted to the Cal/OSHA

Consultation Service, for review and comment concerning compliance of the program with all applicable Safety Orders. The Operation Fire Protection Plan and the Emergency Action Plan shall also be submitted to the City of El Segundo Fire Department for review and comment.

Verification: At least 30 days prior to the start of operation, the project owner shall submit to the CPM a copy of the Project Operations and Maintenance Safety & Health Program.

WORKER Safety-3 Before using one of the fuel oil storage tanks as a clean soils storage area, the project owner shall ensure that the integrity of the floor has not been compromised by cracks or holes, the tanks have been thoroughly cleaned, no airborne hydrocarbons are present above the method detection level of a hand-held PID hydrocarbon vapor detector, and that the earth-moving vehicles used are equipped with environmental cabs.

Verification: At least 30 days prior to the start of using the tanks as a storage area, the project owner shall submit to the CPM a report verifying the integrity of the floor, describing the results of the PID monitoring, and a statement that all earth-moving vehicles used are equipped with properly functioning environmental cabs.

REFERENCES

1998 California Fire Code. Published by the International Fire Code Institute comprised of the International Conference of Building Officials, the Western Fire Chiefs Association, and the California Building Standards Commission. Whittier, CA.

El Segundo Fire Department (ESFD). 2001. Personal communication with Rosemarie Radomsky, Administrative Specialist. April 25, 2001.

ESPR (El Segundo Power Station) 2000a – Application for Certification
Submitted to the California Energy Commission on December 18, 2000.

ESPR (El Segundo Power Station) 2002 – Personal communication with applicant's staff and consultants, Feb. 21, 2002.

FACILITY DESIGN

Testimony of Shahab Khoshmashrab, Al McCuen and Steve Baker

INTRODUCTION

Facility Design encompasses the civil, structural, mechanical and electrical engineering design of the project. The purpose of the Facility Design analysis is to:

- verify that the laws, ordinances, regulations and standards (LORS) applicable to the engineering design and construction of the project have been identified;
- verify that the project and ancillary facilities have been described in sufficient detail, including proposed design criteria and analysis methods, to provide reasonable assurance that the project can be designed and constructed in accordance with all applicable engineering LORS, and in a manner that assures public health and safety;
- determine whether special design features should be considered during final design to deal with conditions unique to the site which could influence public health and safety; and
- describe the design review and construction inspection process and establish Conditions of Certification that will be used to monitor and ensure compliance with the intent of the engineering LORS and any special design requirements.

FINDINGS REQUIRED

The Warren Alquist Act requires the commission to "prepare a written decision ...which includes...(a) Specific provisions relating to the manner in which the proposed facility is to be designed, sited, and operated in order to protect environmental quality and assure public health and safety [and] (d)(1) Findings regarding the conformity of the proposed site and related facilities...with public safety standards...and with other relevant local, regional, state and federal standards, ordinances, or laws..." (Pub. Resources Code, §25523).

SUBJECTS DISCUSSED

Subjects discussed in this analysis include:

- identification of the engineering LORS applicable to facility design;
- evaluation of the applicant's proposed design criteria, including the identification of those criteria that are essential to ensuring public health and safety;
- proposed modifications and additions to the Application for Certification (AFC) that are necessary to comply with applicable engineering LORS; and
- Conditions of Certification proposed by staff to ensure that the project will be designed and constructed to assure public health and safety and comply with all applicable engineering LORS.

SETTING

EL Segundo Power II, LLC proposes to construct and operate a 630 megawatt combined cycle power plant (ESPR 2000a). The project will be located in El Segundo, Los Angeles County. The project site is located at the existing El Segundo Generating Station, and the project includes the demolition and removal of the existing Units 1 and 2. The site is approximately 32.8 fenced acres located southwest of Los Angeles International Airport adjacent to Santa Monica Bay and lies in seismic zone 4. For more information on the site and related project description, please see the **Project Description** section of this document. References to “the City” and “the County” designate the City of El Segundo and Los Angeles County, respectively.

The two Heat Recovery Steam Generators (HRSGs) will be installed in a vertical arrangement instead of the typical horizontal arrangement. The HRSG exhaust stacks will reach 250 feet above grade. Each HRSG will have a steel frame superstructure. Additional engineering design details are contained in the Application for Certification (AFC), in Appendices A through E (ESPR 2000a).

LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)

Lists of LORS applicable to each engineering discipline (civil, structural, mechanical and electrical) are described in the AFC (ESPR 2000a, Appendices A through E and Table 3.12-1). Some of these LORS include the California Building Code (CBC) and standards promulgated by the American National Standards Institute (ANSI), American Society of Mechanical Engineers (ASME), American Society for Testing and Materials (ASTM) and American Boiler Manufacturers Association (ABMA).

ANALYSIS

The basis of this analysis is the applicant's proposed analysis and construction methods and list of engineering LORS and design criteria set forth in the AFC.

SITE PREPARATION AND DEVELOPMENT

Staff has evaluated the proposed design criteria for grading, flood protection, erosion control, site drainage, and site access. Staff has assessed the criteria for designing and constructing linear support facilities such as a natural gas pipeline and electric transmission line. The applicant proposes to use accepted industry standards (see AFC Appendices A through E for a representative list of applicable industry standards), design practices, and construction methods in preparing and developing the site. Staff concludes that the project, including its linear facilities, will likely comply with all applicable site preparation LORS, and proposes Conditions of Certification (see below and the **Geology and Paleontology** section of this document) to ensure compliance.

MAJOR STRUCTURES, SYSTEMS AND EQUIPMENT

Major structures, systems and equipment are defined as those structures and associated components or equipment that are necessary for power production and are costly to repair or replace, that require a long lead time to repair or replace, or that are

used for the storage, containment, or handling of hazardous or toxic materials. Major structures and equipment will be identified through compliance with proposed Condition of Certification **GEN-2** (below).

The AFC contains lists of the civil, structural, mechanical and electrical design criteria that demonstrate the likelihood of compliance with applicable engineering LORS, and that staff believes are essential to ensuring that the project is designed in a manner that protects public health and safety.

The project shall be designed and constructed to the 1998 edition of the California Building Code (CBC), and other applicable codes and standards in effect at the time design and construction of the project actually commence. In the event the initial designs are submitted to the Chief Building Official (CBO) for review and approval when the successor to the 1998 CBC is in effect, the 1998 CBC provisions, identified herein, shall be replaced with the applicable successor provisions.

Certain structures in a power plant may be required, under the CBC, to undergo dynamic lateral force (structural) analysis; others may be designed using the simpler static analysis procedure. In order to ensure that structures are analyzed using the appropriate lateral force procedure, staff has included Proposed Condition of Certification **STRUC-1** (below), which in part requires review and approval by the CBO of the project owner's proposed lateral force procedures prior to the start of construction.

PROJECT QUALITY PROCEDURES

The AFC (ESPR 2000a, § 5.19.6) describes a Project Quality Program that will be used on the project to maximize confidence that systems and components will be designed, fabricated, stored, transported, installed, and tested in accordance with the technical codes and standards appropriate for a power plant. Compliance with design requirements will be verified through an appropriate program of inspections and audits. Employment of this Quality Assurance/Quality Control (QA/QC) program will ensure that the project is actually designed, procured, fabricated and installed as contemplated in this analysis.

COMPLIANCE MONITORING

Under Section 104.2 of the CBC, the building official is authorized and directed to enforce all the provisions of the CBC. For all energy facilities certified by the Energy Commission, the Energy Commission is the building official and has the responsibility to enforce the code. In addition, the Energy Commission has the power to render interpretations of the CBC and to adopt and enforce rules and supplemental regulations to clarify the application of the CBC's provisions.

The Energy Commission's design review and construction inspection process is developed to conform to CBC requirements and ensure that all facility design Conditions of Certification are met. As provided by Section 104.2.2 of the CBC, the Energy Commission appoints experts to carry out the design review and construction inspections and act as delegate CBO on behalf of the Energy Commission. These delegates typically include the local building official and/or independent consultants

hired to cover technical expertise not provided by the local official. The applicant, through permit fees as provided by CBC Sections 107.2 and 107.3, pays the costs of the reviews and inspections. While building permits in addition to the Energy Commission certification are not required for this project, in lieu permit fees are paid by the applicant consistent with CBC Section 107, to cover the costs of reviews and inspections.

Engineering and compliance staff will invite the local building authority, either the City or the County, or a third party engineering consultant, to act as CBO for the project. When an entity has been identified to perform the duties of CBO, Energy Commission staff will complete a Memorandum of Understanding (MOU) with that entity that outlines its roles and responsibilities and those of its subcontractors and delegates.

Staff has developed proposed Conditions of Certification to ensure public health and safety and compliance with engineering design LORS. Some of these conditions address the roles, responsibilities and qualifications of the applicant's engineers responsible for the design and construction of the project (proposed Conditions of Certification **GEN-1** through **GEN-8**). Engineers responsible for the design of the civil, structural, mechanical, and electrical portions of the project are required to be registered in California, and to sign and stamp each submittal of design plans, calculations, and specifications submitted to the CBO. These conditions require that no element of construction subject to CBO review and approval shall proceed without prior approval from the CBO. They also require that qualified special inspectors be assigned to perform or oversee special inspections required by the applicable LORS.

While the Energy Commission and delegate CBO have the authority to allow some flexibility in scheduling construction activities, these conditions are written to require that no element of construction of permanent facilities subject to CBO review and approval, which would be difficult to reverse or correct, may proceed without prior approval of plans by the CBO. For those elements of construction that are not difficult to reverse and are allowed to proceed without approval of the plans, the applicant shall bear the responsibility to fully modify those elements of construction to comply with all design changes that result from the CBO's plan review and approval process.

FACILITY CLOSURE

The removal of a facility from service, or decommissioning, as a result of the project reaching the end of its useful life, may range from "mothballing" to removal of all equipment and appurtenant facilities and restoration of the site. Future conditions that may affect the decommissioning decision are largely unknown at this time.

In order to assure that decommissioning of the facility will be completed in a manner that is environmentally sound, safe, and will protect public health and safety, the applicant shall submit a closure plan to the Energy Commission for review and approval prior to the commencement of decommissioning. The plan shall include a discussion of the following items:

- proposed decommissioning activities for the project and all appurtenant facilities constructed as part of the project;

- all applicable LORS, local/regional plans, and the conformance of the proposed decommissioning activities to the applicable LORS and local/regional plans;
- the activities necessary to restore the site if the plan requires removal of all equipment and appurtenant facilities; and
- decommissioning alternatives, other than complete site restoration.

The above requirements should serve as adequate protection, even in the unlikely event of project abandonment. Staff has proposed general conditions (see **General Conditions**) to ensure that these measures are included in the Facility Closure plan.

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

1. The laws, ordinances, regulations, and standards (LORS) identified in the AFC and supporting documents are those applicable to the project.
2. Staff has evaluated the proposed engineering LORS, design criteria and design methods in the record, and concludes that the design, construction and eventual closure of the project are likely to comply with applicable engineering LORS.
3. The Conditions of Certification proposed will ensure that the proposed facilities are designed and constructed in accordance with applicable engineering LORS. This will occur through the use of design review, plan checking, and field inspections that are to be performed by the CBO or other Energy Commission delegate. Staff will audit the CBO to ensure satisfactory performance.
4. Whereas future conditions that may affect decommissioning are largely unknown at this time, it can reasonably be concluded that if the project owner submits a closure plan as required in the General Conditions portion of this document prior to the commencement of decommissioning, the decommissioning procedure is likely to occur in compliance with all applicable engineering LORS.

RECOMMENDATIONS

Energy Commission staff recommends that:

1. The Conditions of Certification proposed herein be adopted to ensure that the project is designed and constructed to assure public health and safety, and to ensure compliance with all applicable engineering LORS;
2. The project be designed and built to the 1998 CBC (or successor standard, if such is in effect when the initial project engineering designs are submitted for review); and
3. The CBO shall review the final designs, conduct plan checking and perform field inspections during construction, and Energy Commission staff shall audit and monitor the CBO to ensure satisfactory performance.

CONDITIONS OF CERTIFICATION

Some of the Conditions of Certification in this section have been changed from the PSA based on staff's efforts to standardize Conditions of Certification to the extent feasible based on recent experience in the certification and compliance process. These changes do not affect the substance of the requirements in the Condition. Other Conditions have been changed based on stipulated agreements between staff and the applicant. All of the modified Conditions are supported by the analysis outlined in the text above.

GEN-1 The project owner shall design, construct and inspect the project in accordance with the 1998 California Building Code (CBC) and all other applicable LORS in effect at the time initial design plans are submitted to the CBO for review and approval. (The CBC in effect is that edition that has been adopted by the California Building Standards Commission and published at least 180 days previously.) All transmission facilities (lines, switchyards, switching stations, and substations) are handled in Conditions of Certification in the **Transmission System Engineering** section of this document.

In the event that the initial engineering designs are submitted to the CBO when a successor to the 1998 CBC is in effect, the 1998 CBC provisions identified herein shall be replaced with the applicable successor provisions. Where, in any specific case, different sections of the code specify different materials, methods of construction, or other requirements, the most restrictive shall govern. Where there is a conflict between a general requirement and a specific requirement, the specific requirement shall govern.

Verification: Within 30 days after receipt of the Certificate of Occupancy, the project owner shall submit to the California Energy Commission Compliance Project Manager (CPM) a statement of verification, signed by the responsible design engineer, attesting that all designs, construction, installation and inspection requirements of the applicable LORS and the Energy Commission's Decision have been met in the area of facility design. The project owner shall provide the CPM a copy of the Certificate of Occupancy within 30 days of receipt from the CBO [1998 CBC, Section 109 – Certificate of Occupancy].

GEN-2 Prior to submittal of the initial engineering designs for CBO review, the project owner shall furnish to the CPM and to the CBO a schedule of facility design submittals, a Master Drawing List, and a Master Specifications List. The schedule shall contain a list of proposed submittal packages of designs, calculations, and specifications for major structures and equipment. To facilitate audits by Energy Commission staff, the project owner shall provide specific packages to the CPM when requested.

Verification: At least 60 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of rough grading, the project owner shall submit to the CBO and to the CPM the schedule, the Master Drawing List, and the Master Specifications List of documents to be submitted to the CBO for review and

approval. These documents shall be the pertinent design documents for the major structures and equipment listed in Table 1 below. Major structures and equipment shall be added to or deleted from the Table only with CPM approval. The project owner shall provide schedule updates in the Monthly Compliance Report.

Table 1: Major Structures and Equipment List

Equipment/System	Quantity (Plant)
Combustion Turbine (CT) Foundation and Connections	2
HP/IP Steam Turbine (ST) Foundation and Connections	1
LP Steam Turbine (ST) Foundation and Connections	1
Combustion Turbine Generator Foundation and Connections	2
Steam Turbine Generator Foundation and Connections	1
Heat Recovery Steam Generator (HRSG) Structure, Foundation and Connections	2
Auxiliary Transformer Foundation and Connections	2
CT Inlet Air Plenum Structure, Foundation and Connections	2
Inlet Air Evaporative Cooler Structure, Foundation and Connections	2
HRSG Exhaust Stack, Foundation and Connections	2
Isolated Phase Bus Duct	2
HRSG Transition Duct from CTG — Structure	2
Secondary Unit Substation/Transformer	2
Electrical/Control Center	2
Condenser Structure, Foundation and Connections	1
Feed Water Pump Foundation and Connections	4
Condensate Pump Foundation and Connections	2
Feed Water Heater Foundation and Connections	2
Air Compressor Foundation and Connections	2
CT Water Injection Skid Foundation and Connections	2
CT Static Starter Skid Foundation and Connections	2
CT Mechanical Accessory Compartment Foundation and Connections	2
Switchgear Equipment Building Structure, Foundation and Connections	2
CT Generator Step-up Transformer Foundation and Connections	2
ST Generator Step-up Transformer Foundation and Connections	1
HRSG Blowdown Tank Foundation and Connections	2
Boiler Circulating Pump Connections	8
Condensate Circulating Pump Foundation and Connections	4
Fuel Gas Heater Foundation and Connections	2
ST Lube Oil Package Foundation and Connections	1

Equipment/System	Quantity (Plant)
Drain Cooler Foundation and Connections	1
Air Receiver Foundation and Connections	1
Air Dryer Foundation and Connections	1
Closed Cycle Cooling Water Heat Exchanger Foundation and Connections	2
Closed Cycle Cooling Water Pump Foundation and Connections	2
Potable Water Systems	1 Lot
Drainage Systems (including sanitary drain and waste)	1 Lot
Building Energy Conservation Systems	1 Lot
Temperature Control and Ventilation Systems (including water and sewer connections)	1 Lot
High Pressure Piping	1 Lot
HVAC and Refrigeration Systems	1 Lot

GEN-3 The project owner shall make payments to the CBO for design review, plan check and construction inspection based upon a reasonable fee schedule to be negotiated between the project owner and the CBO. These fees may be consistent with the fees listed in the 1998 CBC [Chapter 1, Section 107 and Table 1-A, Building Permit Fees; Appendix Chapter 33, Section 3310 and Table A-33-A, Grading Plan Review Fees; and Table A-33-B, Grading Permit Fees], adjusted for inflation and other appropriate adjustments; may be based on the value of the facilities reviewed; may be based on hourly rates; or may be as otherwise agreed by the project owner and the CBO.

Verification: The project owner shall make the required payments to the CBO in accordance with the agreement between the project owner and the CBO. The project owner shall send a copy of the CBO's receipt of payment to the CPM in the next Monthly Compliance Report indicating that the applicable fees have been paid.

GEN-4 Prior to the start of rough grading, the project owner shall assign a California registered architect, structural engineer or civil engineer, as a resident engineer (RE), to be in general responsible charge of the project [Building Standards Administrative Code (Cal. Code Regs., tit. 24, § 4-209, Designation of Responsibilities).] All transmission facilities (lines, switchyards, switching stations, and substations) are handled in Conditions of Certification in the **Transmission System Engineering** section of this document.

The RE may delegate responsibility for portions of the project to other registered engineers. Registered mechanical and electrical engineers may be delegated responsibility for mechanical and electrical portions of the project respectively. A project may be divided into parts, provided each part is clearly defined as a distinct unit. Separate assignment of general responsible charge may be made for each designated part.

The RE shall:

1. Monitor construction progress of work requiring CBO design review and inspection to ensure compliance with LORS;
2. Ensure that construction of all the facilities subject to CBO design review and inspection conforms in every material respect to the applicable LORS, these Conditions of Certification, approved plans, and specifications;
3. Prepare documents to initiate changes in the approved drawings and specifications when directed by the project owner or as required by conditions on the project;
4. Be responsible for providing the project inspectors and testing agency(ies) with complete and up-to-date set(s) of stamped drawings, plans, specifications and any other required documents;
5. Be responsible for the timely submittal of construction progress reports to the CBO from the project inspectors, the contractor, and other engineers who have been delegated responsibility for portions of the project; and
6. Be responsible for notifying the CBO of corrective action or the disposition of items noted on laboratory reports or other tests as not conforming to the approved plans and specifications.

The RE shall have the authority to halt construction and to require changes or remedial work, if the work does not conform to applicable requirements.

If the RE or the delegated engineers are reassigned or replaced, the project owner shall submit the name, qualifications and registration number of the newly assigned engineer to the CBO for review and approval. The project owner shall notify the CPM of the CBO's approval of the new engineer.

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

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

GEN-5 Prior to the start of rough grading, the project owner shall assign at least one of each of the following California registered engineers to the project: A) a civil engineer; B) a geotechnical engineer or a civil engineer experienced and

knowledgeable in the practice of soils engineering; C) a design engineer, who is either a structural engineer or a civil engineer fully competent and proficient in the design of power plant structures and equipment supports; D) a mechanical engineer; and E) an electrical engineer. [California Business and Professions Code section 6704 et seq., and sections 6730 and 6736 requires state registration to practice as a civil engineer or structural engineer in California.] All transmission facilities (lines, switchyards, switching stations, and substations) are handled in Conditions of Certification in the **Transmission System Engineering** section of this document.

The tasks performed by the civil, mechanical, electrical or design engineers may be divided between two or more engineers, as long as each engineer is responsible for a particular segment of the project (e.g., proposed earthwork, civil structures, power plant structures, equipment support). No segment of the project shall have more than one responsible engineer. The transmission line may be the responsibility of a separate California registered electrical engineer.

The project owner shall submit to the CBO for review and approval, the names, qualifications and registration numbers of all responsible engineers assigned to the project [1998 CBC, Section 104.2, Powers and Duties of Building Official].

If any one of the designated responsible engineers is subsequently reassigned or replaced, the project owner shall submit the name, qualifications and registration number of the newly assigned responsible engineer to the CBO for review and approval. The project owner shall notify the CPM of the CBO's approval of the new engineer.

A: The civil engineer shall:

1. Design, or be responsible for design, stamp, and sign all plans, calculations, and specifications for proposed site work, civil works, and related facilities requiring design review and inspection by the CBO. At a minimum, these include: grading, site preparation, excavation, compaction, construction of secondary containment, foundations, erosion and sedimentation control structures, drainage facilities, underground utilities, culverts, site access roads, and sanitary sewer systems; and
2. Provide consultation to the RE during the construction phase of the project, and recommend changes in the design of the civil works facilities and changes in the construction procedures.

B: The geotechnical engineer or civil engineer, experienced and knowledgeable in the practice of soils engineering, shall:

1. Review all the engineering geology reports, and prepare final soils grading report;

2. Prepare the soils engineering reports required by the 1998 CBC, Appendix Chapter 33, Section 3309.5 – Soils Engineering Report, and Section 3309.6 – Engineering Geology Report;
3. Be present, as required, during site grading and earthwork to provide consultation and monitor compliance with the requirements set forth in the 1998 CBC, Appendix Chapter 33, section 3317, Grading Inspections;
4. Recommend field changes to the civil engineer and RE;
5. Review the geotechnical report, field exploration report, laboratory tests, and engineering analyses detailing the nature and extent of the site soils that may be susceptible to liquefaction, rapid settlement or collapse when saturated under load; and
6. Prepare reports on foundation investigation to comply with the 1998 CBC, Chapter 18 section 1804, Foundation Investigations.

This engineer shall be authorized to halt earthwork and to require changes; if site conditions are unsafe or do not conform with predicted conditions used as a basis for design of earthwork or foundations [1998 CBC, section 104.2.4, Stop orders].

C: The design engineer shall:

1. Be directly responsible for the design of the proposed structures and equipment supports;
2. Provide consultation to the RE during design and construction of the project;
3. Monitor construction progress to ensure compliance with LORS;
4. Evaluate and recommend necessary changes in design; and
5. Prepare and sign all major building plans, specifications and calculations.

D: The mechanical engineer shall be responsible for, and sign and stamp a statement with, each mechanical submittal to the CBO, stating that the proposed final design plans, specifications, and calculations conform with all of the mechanical engineering design requirements set forth in the Energy Commission's Decision.

E: The electrical engineer shall:

1. Be responsible for the electrical design of the project; and
2. Sign and stamp electrical design drawings, plans, specifications, and calculations.

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

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

GEN-6 Prior to the start of an activity requiring special inspection, the project owner shall assign to the project, qualified and certified special inspector(s) who shall be responsible for the special inspections required by the 1998 CBC, Chapter 17, Section 1701, Special Inspections, Section, 1701.5 Type of Work (requiring special inspection), and Section 106.3.5, Inspection and observation program. All transmission facilities (lines, switchyards, switching stations, and substations) are handled in Conditions of Certification in the **Transmission System Engineering** section of this document.

The special inspector shall:

1. Be a qualified person who shall demonstrate competence, to the satisfaction of the CBO, for inspection of the particular type of construction requiring special or continuous inspection;
2. Observe the work assigned for conformance with the approved design drawings and specifications;
3. Furnish inspection reports to the CBO and RE. All discrepancies shall be brought to the immediate attention of the RE for correction, then, if uncorrected, to the CBO and the CPM for corrective action; and
4. Submit a final signed report to the RE, CBO, and CPM, stating whether the work requiring special inspection was, to the best of the inspector's knowledge, in conformance with the approved plans and specifications and the applicable provisions of the applicable edition of the CBC.

A certified weld inspector, certified by the American Welding Society (AWS), and/or American Society of Mechanical Engineers (ASME) as applicable, shall inspect welding performed on-site requiring special inspection (including structural, piping, tanks and pressure vessels).

Verification: At least 15 days prior to the start of an activity requiring special inspection, the project owner shall submit to the CBO for review and approval, with a copy to the CPM, the name(s) and qualifications of the certified weld inspector(s), or other certified special inspector(s) assigned to the project to perform one or more of the

duties set forth above. The project owner shall also submit to the CPM a copy of the CBO's approval of the qualifications of all special inspectors in the next Monthly Compliance Report.

If the special inspector is subsequently reassigned or replaced, the project owner has five days in which to submit the name and qualifications of the newly assigned special inspector to the CBO for approval. The project owner shall notify the CPM of the CBO's approval of the newly assigned inspector within five days of the approval.

GEN-7 The project owner shall keep the CBO informed regarding the status of engineering and construction. If any discrepancy in design and/or construction is discovered in any work that has undergone CBO design review and approval, the project owner shall document the discrepancy and recommend the corrective action required. The discrepancy documentation shall be submitted to the CBO for review and approval. The discrepancy documentation shall reference this Condition of Certification and, if appropriate, the applicable sections of the CBC and/or other LORS.

Verification: The project owner shall transmit a copy of the CBO's approval of any corrective action taken to resolve a discrepancy to the CPM in the next Monthly Compliance Report. If any corrective action is disapproved, the project owner shall advise the CPM, within five days, of the reason for disapproval, and the revised corrective action to obtain CBO's approval.

GEN-8 The project owner shall obtain the CBO's final approval of all completed work that has undergone CBO design review and approval. The project owner shall request the CBO to inspect the completed structure and review the submitted documents. When the work and the "as-built" and "as graded" plans conform to the approved final plans, the project owner shall notify the CPM regarding the CBO's final approval. The marked up "as-built" drawings for the construction of structural and architectural work shall be submitted to the CBO. Changes approved by the CBO shall be identified on the "as-built" drawings [1998 CBC, Section 108, Inspections]. The project owner shall retain one set of approved engineering plans, specifications and calculations at the project site or at another accessible location during the operating life of the project [1998 CBC, Section 106.4.2, Retention of plans].

Verification: Within 15 days of the completion of any work, the project owner shall submit to the CBO, with a copy to the CPM in the next Monthly Compliance Report, (a) a written notice that the completed work is ready for final inspection, and (b) a signed statement that the work conforms to the final approved plans. After storing final approved engineering plans, specifications and calculations as described above, the project owner shall submit to the CPM a letter stating that the above documents have been stored and indicate the storage location of such documents.

GEN-9 The project owner shall file a closure/decommissioning plan with the County and the City for review and comment, and the CPM for review and approval, at least 12 months (or other time mutually agreed to by the project owner and the CPM) prior to commencing the closure activities. If the project is abandoned before construction is completed, the project owner shall return the site to its original condition.

The closure plan shall include a discussion of the following:

1. The proposed closure/decommissioning activities for the project and all appurtenant facilities constructed as part of the project;
2. All applicable LORS, all local/regional plans, and a discussion of the conformance of the proposed decommissioning activities to the applicable LORS and local/regional plans;
3. Activities necessary to restore the site if the ESPR decommissioning plan requires removal of all equipment and appurtenant facilities; and
4. Closure/decommissioning alternatives, other than complete restoration of the site.

Verification: At least 12 months (or other period of time mutually agreed to by the project owner and the CPM) prior to closure or decommissioning activities, the project owner shall file a copy of the closure/decommissioning plan with the County and the City for review and comment, and the CPM for review and approval. Prior to the submittal of the closure plan, a meeting shall be held between the project owner and the CPM for discussing the specific contents of the plan.

CIVIL-1 Prior to the start of site grading, the project owner shall submit to the CBO for review and approval the following:

1. Design of the proposed drainage structures and the grading plan;
2. An erosion and sedimentation control plan;
3. Related calculations and specifications, signed and stamped by the responsible civil engineer; and
4. Soils report as required by the 1998 CBC [Appendix Chapter 33, Section 3309.5, Soils Engineering Report and Section 3309.6, Engineering Geology Report].

Verification: At least 15 days prior to the start of site grading (or a lesser number of days mutually agreed to by the project owner and the CBO), the project owner shall submit the documents described above to the CBO for design review and approval. In the next Monthly Compliance Report following the CBO's approval, the project owner shall submit a written statement certifying that the documents have been approved by the CBO.

CIVIL-2 The resident engineer shall, if appropriate, stop all earthworks and construction in the affected areas when the responsible geotechnical engineer or civil engineer experienced and knowledgeable in the practice of soils engineering identifies unforeseen adverse soil or geologic conditions. The project owner shall submit modified plans, specifications and calculations to the CBO based on these new conditions. The project owner shall obtain approval from the CBO before resuming earthwork and construction in the affected area [1998 CBC, Section 104.2.4, Stop orders].

Verification: The project owner shall notify the CPM, within five days, when earthwork and construction is stopped as a result of unforeseen adverse geologic/soil conditions. Within five days of the CBO's approval to resume earthwork and construction in the affected areas, the project owner shall provide to the CPM a copy of the CBO's approval.

CIVIL-3 The project owner shall perform inspections in accordance with the 1998 CBC, Chapter 1, Section 108, Inspections; Chapter 17, Section 1701.6, Continuous and Periodic Special Inspection; and Appendix Chapter 33, Section 3317, Grading Inspection. All plant site-grading operations for which a grading permit is required shall be subject to inspection by the CBO.

If, in the course of inspection, it is discovered that the work is not being performed in accordance with the approved plans, the discrepancies shall be reported immediately to the resident engineer, the CBO, and the CPM. The project owner shall prepare a written report detailing all discrepancies and non-compliance items, and the proposed corrective action, and send copies to the CBO and the CPM.

Verification: Within five days of the discovery of any discrepancies, the resident engineer shall transmit to the CBO and the CPM a Non-Conformance Report (NCR), and the proposed corrective action. Within five days of resolution of the NCR, the project owner shall submit the details of the corrective action to the CBO and the CPM. A list of NCRs, for the reporting month, shall also be included in the following Monthly Compliance Report.

CIVIL-4 After completion of finished grading and erosion and sedimentation control and drainage facilities, the project owner shall obtain the CBO's approval of the final "as-graded" grading plans, and final "as-built" plans for the erosion and sedimentation control facilities [1998 CBC, Section 109, Certificate of Occupancy].

Verification: Within 30 days of the completion of the erosion and sediment control mitigation and drainage facilities, the project owner shall submit to the CBO the responsible civil engineer's signed statement that the installation of the facilities and all erosion control measures were completed in accordance with the final approved combined grading plans, and that the facilities are adequate for their intended purposes. The project owner shall submit a copy of this report to the CPM in the next Monthly Compliance Report.

STRUC-1 Prior to the start of any increment of construction of any major structure or component listed in **Table 1** of Condition of Certification **GEN-2**, above, the project owner shall submit to the CBO for design review and approval the proposed lateral force procedures for project structures and the applicable designs, plans and drawings for project structures. Proposed lateral force procedures, designs, plans and drawings shall be those for the following items (from **Table 1**, above):

1. Major project structures;
2. Major foundations, equipment supports and anchorage;

3. Large field fabricated tanks;
4. Turbine/generator pedestal; and
5. Switchyard structures.

Construction of any structure or component shall not commence until the CBO has approved the lateral force procedures to be employed in designing that structure or component.

The project owner shall:

1. Obtain approval from the CBO of lateral force procedures proposed for project structures;
2. Obtain approval from the CBO for the final design plans, specifications, calculations, soils reports, and applicable quality control procedures. If there are conflicting requirements, the more stringent shall govern (i.e., highest loads, or lowest allowable stresses shall govern). All plans, calculations, and specifications for foundations that support structures shall be filed concurrently with the structure plans, calculations, and specifications [1998 CBC, Section 108.4, Approval Required];
3. Submit to the CBO the required number of copies of the structural plans, specifications, calculations, and other required documents of the designated major structures at least 60 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of on-site fabrication and installation of each structure, equipment support, or foundation [1998 CBC, Section 106.4.2, Retention of plans and Section 106.3.2, Submittal documents]; and
4. Ensure that the final plans, calculations, and specifications clearly reflect the inclusion of approved criteria, assumptions, and methods used to develop the design. The final designs, plans, calculations and specifications shall be signed and stamped by the responsible design engineer [1998 CBC, Section 106.3.4, Architect or Engineer of Record].

Verification: At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of any increment of construction of any structure or component listed in Table 1 of Condition of Certification GEN-2, above the project owner shall submit to the CBO, with a copy to the CPM, the responsible design engineer's signed statement that the final design plans, specifications and calculations conform with all of the requirements set forth in the Energy Commission's Decision.

If the CBO discovers non-conformance with the stated requirements, the project owner shall resubmit the corrected plans to the CBO within 20 days of receipt of the nonconforming submittal with a copy of the transmittal letter to the CPM.

The project owner shall submit to the CPM a copy of a statement from the CBO that the proposed structural plans, specifications, and calculations have been approved and are in conformance with the requirements set forth in the applicable LORS.

STRUC-2 The project owner shall submit to the CBO the required number of sets of the following documents related to work that has undergone CBO design review and approval:

1. Concrete cylinder strength test reports (including date of testing, date sample taken, design concrete strength, tested cylinder strength, age of test, type and size of sample, location and quantity of concrete placement from which sample was taken, and mix design designation and parameters);
2. Concrete pour sign-off sheets;
3. Bolt torque inspection reports (including location of test, date, bolt size, and recorded torques);
4. Field weld inspection reports (including type of weld, location of weld, inspection of non-destructive testing (NDT) procedure and results, welder qualifications, certifications, qualified procedure description or number (ref: AWS); and
5. Reports covering other structural activities requiring special inspections shall be in accordance with the 1998 CBC, Chapter 17, Section 1701, Special Inspections, Section 1701.5, Type of Work (requiring special inspection), Section 1702, Structural Observation and Section 1703, Nondestructive Testing.

Verification: If a discrepancy is discovered in any of the above data, the project owner shall, within five days, prepare and submit an NCR describing the nature of the discrepancies to the CBO, with a copy of the transmittal letter to the CPM. The NCR shall reference the Condition(s) of Certification and the applicable CBC chapter and section. Within five days of resolution of the NCR, the project owner shall submit a copy of the corrective action to the CBO and the CPM.

The project owner shall transmit a copy of the CBO's approval or disapproval of the corrective action to the CPM within 15 days. If disapproved, the project owner shall advise the CPM, within five days, the reason for disapproval, and the revised corrective action to obtain CBO's approval.

STRUC-3 The project owner shall submit to the CBO design changes to the final plans required by the 1998 CBC, Chapter 1, Section 106.3.2, Submittal documents, and Section 106.3.3, Information on plans and specifications, including the revised drawings, specifications, calculations, and a complete description of, and supporting rationale for, the proposed changes, and shall give the CBO prior notice of the intended filing.

Verification: On a schedule suitable to the CBO, the project owner shall notify the CBO of the intended filing of design changes, and shall submit the required number of sets of revised drawings and the required number of copies of the other above-mentioned documents to the CBO, with a copy of the transmittal letter to the CPM. The project owner shall notify the CPM, via the Monthly Compliance Report, when the CBO has approved the revised plans.

STRUC-4 Tanks and vessels containing quantities of toxic or hazardous materials exceeding amounts specified in Chapter 3, Table 3-E of the 1998 CBC shall, at a minimum, be designed to comply with Occupancy Category 2 of the 1998 CBC.

Verification: At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of installation of the tanks or vessels containing the above specified quantities of toxic or hazardous materials, the project owner shall submit to the CBO for design review and approval final design plans, specifications, and calculations, including a copy of the signed and stamped engineer's certification.

The project owner shall send copies of the CBO approvals of plan checks to the CPM in the following Monthly Compliance Report. The project owner shall also transmit a copy of the CBO's inspection approvals to the CPM in the Monthly Compliance Report following completion of any inspection.

MECH-1 Prior to the start of any increment of major piping or plumbing construction, the project owner shall submit, for CBO design review and approval, the proposed final design, specifications and calculations for each plant major piping and plumbing system listed in Table 1, Condition of Certification GEN 2, above. Physical layout drawings and drawings not related to code compliance and life safety need not be submitted. The submittal shall also include the applicable QA/QC procedures. Upon completion of construction of any such major piping or plumbing system, the project owner shall request the CBO's inspection approval of said construction [1998 CBC, Section 106.3.2, Submittal Documents, Section 108.3, Inspection Requests, Section 108.4, Approval Required; 1998 California Plumbing Code, Section 103.5.4, Inspection Request, Section 301.1.1, Approval].

The responsible mechanical engineer shall stamp and sign all plans, drawings and calculations for the major piping and plumbing systems subject to the CBO design review and approval, and submit a signed statement to the CBO when the said proposed piping and plumbing systems have been designed, fabricated and installed in accordance with all of the applicable laws, ordinances, regulations and industry standards [Section 106.3.4, Architect or Engineer of Record], which may include, but not be limited to:

American National Standards Institute (ANSI) B31.1 (Power Piping Code);
ANSI B31.2 (Fuel Gas Piping Code);
ANSI B31.3 (Chemical Plant and Petroleum Refinery Piping Code);
ANSI B31.8 (Gas Transmission and Distribution Piping Code);
Title 24, California Code of Regulations, Part 5 (California Plumbing Code);

Title 24, California Code of Regulations, Part 6 (California Energy Code, for building energy conservation systems and temperature control and ventilation systems);

Title 24, California Code of Regulations, Part 2 (California Building Code); and Specific City/County code.

The CBO may deputize inspectors to carry out the functions of the code enforcement agency [1998 CBC, Section 104.2.2, Deputies].

Verification: At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of any increment of major piping or plumbing construction listed in Table 1, Condition of Certification GEN-2 above, the project owner shall submit to the CBO for design review and approval the final plans, specifications and calculations, including a copy of the signed and stamped statement from the responsible mechanical engineer certifying compliance with the applicable LORS, and shall send the CPM a copy of the transmittal letter in the next Monthly Compliance Report.

The project owner shall transmit to the CPM, in the Monthly Compliance Report following completion of any inspection, a copy of the transmittal letter conveying the CBO's inspection approvals.

MECH-2 For all pressure vessels installed in the plant, the project owner shall submit to the CBO and California Occupational Safety and Health Administration (Cal-OSHA), prior to operation, the code certification papers and other documents required by the applicable LORS. Upon completion of the installation of any pressure vessel, the project owner shall request the appropriate CBO and/or Cal-OSHA inspection of said installation [1998 CBC, Section 108.3 – Inspection Requests].

The project owner shall:

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

Verification: At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of on-site fabrication or installation of any pressure vessel, the project owner shall submit to the CBO for design review and approval, the above listed documents, including a copy of the signed and stamped engineer's certification, with a copy of the transmittal letter to the CPM.

The project owner shall transmit to the CPM, in the Monthly Compliance Report following completion of any inspection, a copy of the transmittal letter conveying the CBO's and/or Cal-OSHA inspection approvals.

MECH-3 Prior to the start of construction of any heating, ventilating, air conditioning (HVAC) or refrigeration system, the project owner shall submit to the CBO for design review and approval the design plans, specifications, calculations and quality control procedures for that system. Packaged HVAC systems, where used, shall be identified with the appropriate manufacturer's data sheets.

The project owner shall design and install all HVAC and refrigeration systems within buildings and related structures in accordance with the CBC and other applicable codes. Upon completion of any increment of construction, the project owner shall request the CBO's inspection and approval of said construction. The final plans, specifications and calculations shall include approved criteria, assumptions and methods used to develop the design. In addition, the responsible mechanical engineer shall sign and stamp all plans, drawings and calculations and submit a signed statement to the CBO that the proposed final design plans, specifications and calculations conform with the applicable LORS [1998 CBC, Section 108.7, Other Inspections; Section 106.3.4, Architect or Engineer of Record].

Verification: At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of construction of any HVAC or refrigeration system, the project owner shall submit to the CBO the required HVAC and refrigeration calculations, plans and specifications, including a copy of the signed and stamped statement from the responsible mechanical engineer certifying compliance with the CBC and other applicable codes, with a copy of the transmittal letter to the CPM.

ELEC-1 Prior to the start of any increment of electrical construction for electrical equipment and systems 480 volts and higher, listed below, with the exception of underground duct work and any physical layout drawings and drawings not related to code compliance and life safety, the project owner shall submit, for CBO design review and approval, the proposed final design, specifications and calculations [CBC 1998, Section 106.3.2, Submittal documents]. Upon approval, the above listed plans, together with design changes and design change notices, shall remain on the site or at another accessible location for the operating life of the project. The project owner shall request that the CBO inspect the installation to ensure compliance with the requirements of applicable LORS [1998 CBC, Section 108.4, Approval Required, and Section 108.3, Inspection Requests]. All transmission facilities (lines, switchyards, switching stations, and substations) are handled in Conditions of Certification in the **Transmission System Engineering** section of this document.

A. Final plant design plans to include:

1. one-line diagrams for the 13.8 kV, 4.16 kV and 480 V systems; and
2. system grounding drawings.

B. Final plant calculations to establish:

1. short-circuit ratings of plant equipment;
2. ampacity of feeder cables;
3. voltage drop in feeder cables;
4. system grounding requirements;
5. coordination study calculations for fuses, circuit breakers and protective relay settings for the 13.8 kV, 4.16 kV and 480 V systems;
6. system grounding requirements; and
7. lighting energy calculations.

C. The following activities shall be reported to the CPM in the Monthly Compliance Report:

1. receipt or delay of major electrical equipment;
2. testing or energization of major electrical equipment; and
3. a signed statement by the registered electrical engineer certifying that the proposed final design plans and specifications conform to requirements set forth in the Energy Commission Decision.

Verification: At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of each increment of electrical construction, the project owner shall submit to the CBO for design review and approval the above listed documents. The project owner shall include in this submittal a copy of the signed and stamped statement from the responsible electrical engineer attesting compliance with the applicable LORS, and shall send the CPM a copy of the transmittal letter in the next Monthly Compliance Report.

REFERENCES

ESPR (El Segundo Power Station). 2000a. Application for Certification for the El Segundo Power Redevelopment Project (00-AFC-14). Submitted to the California Energy Commission, December 18, 2000.

GEOLOGY AND PALEONTOLOGY

Supplemental Testimony of Dal Hunter, Ph.D.

INTRODUCTION

The geology and paleontology section discusses the project's potential impacts regarding geological hazards, geological and paleontological resources. The purpose of this analysis is to verify that the applicable laws, ordinances, regulations, and standards (LORS) have been identified and that the project can be designed and constructed in accordance with all applicable LORS, and in a manner that protects environmental quality and assures public health and safety. Energy Commission staff's objective is to ensure that there will be no significant adverse impacts to significant geological and paleontological resources and surface water hydrology during project construction, operation and closure. The section concludes with the staff's proposed monitoring and mitigation measures with respect to geological hazards, geological and paleontological resources, and surface water hydrology, with the inclusion of thirteen Conditions of Certification.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS (LORS)

The applicable LORS are listed in the AFC, in sections 5.3, 5.5, and 5.8 (ESPR 2000a). A brief description of the LORS for surface water hydrology is presented in the **Soils and Water Resources** section of the staff assessment. A brief description of the LORS for paleontological resources, and geological hazards and resources follows.

FEDERAL

There are no federal LORS for geological hazards and resources, paleontological resources, or grading for the proposed project.

STATE AND LOCAL

The California Building Code (CBC) 1998 edition is based upon the Uniform Building Code (UBC), 1997 edition, which was published by the International Conference of Building Officials. The CBC is a series of standards that are used in investigation, design (Chapters 16 and 18) and construction.

The California Environmental Quality Act (CEQA) Guidelines Appendix G provides a checklist of questions that a lead agency should normally address if relevant to a project's environmental impacts.

- Section (V) (c) asks if the project will directly or indirectly destroy a unique paleontological resource or site or unique geological feature.
- Sections (VI) (a), (b), (c), (d), and (e) pose questions that are focused on whether or not the project would expose persons or structures to geological hazards.
- Sections (X) (a) and (b) pose questions about the project's effect on mineral resources.

The Standard Procedures, Measures for Assessment and Mitigation of Adverse Impacts to Non-renewable Paleontologic Resources are a set of procedures and standards for assessing and mitigating impacts to vertebrate paleontological resources (SVP 1994). They were adopted in October 1994 by the Society of Vertebrate Paleontologists, a national organization of vertebrate paleontologists.

SETTING

The El Segundo Power Redevelopment (ESPR) Project is located within the El Segundo Generating Station (ESGS). ESGS is located on the Torrance Plain of the Peninsular Range geologic province at 33.911 degrees north latitude by 118.424 degrees west longitude. The project is flanked by a bike path along a beach, the Pacific Ocean to the west, and a dune sand cut slope to the east. The El Segundo oil field lies approximately one mile east of the project. Two inactive 13±-million-gallon oil tanks are located just south of the El Segundo Generating Station.

The project will involve the demolition of existing Units 1 and 2 at the ESGS. No existing natural gas pipelines, water pipelines, or electrical transmission lines are to be rebuilt, or added to the site as a result of the redevelopment project. It is understood that excavation for removal of the foundations for Units 1 and 2 will be approximately 10 feet below existing grade, and then 10 feet of engineered fill will be placed in the excavation. It is understood that the two large oil tanks south of ESGS will be modified and used to temporarily store soil and crushed concrete generated by demolition of Units 1 and 2.

The project is not crossed by known active faults. The depth to ground water varies with the tide, but ground water may be encountered at ten feet below existing grade. Site near-surface geology consists of artificial fill, alluvium and semi-consolidated dune sand. The character of the fill is unknown. Since the plant was constructed in the early 1950's, construction records documenting fill material and compaction may not be available. Borings from the early foundation reports for the project (ESPR 2000a, Appendix G) do not indicate the presence of fill. The alluvium is made up of Quaternary to Recent age sands, silts, clays, and gravel beneath existing fill. Underneath the alluvium are Tertiary age marine and continental units of sandstone, conglomerate, and clays. A 1.75:1 (horizontal to vertical) cut slope makes up the eastern border of the site. This slope is heavily vegetated and is made up of semi-consolidated dune sand. The slope is approximately 70 feet high and is not terraced along most of its length. The toe of the slope is supported by an approximately 3-foot-high concrete retaining wall, which also bears a number of pipes associated with the facility. The southern end of the 1.75:1 slope includes two additional retaining walls, each about 5 feet high, stepped up the slope. These higher walls appear to terminate to the north just about at the southern end of Units 1 and 2. North of Units 1 and 2, the slope steepens to 1.5:1.

The project site lies at an elevation of approximately 19 to 20 feet above mean sea level. Existing grade at the power plant site is approximately 1 percent. The existing site drainage is sheet flow in nature and drains locally via on-site drainage channels into a retention basin to the south. A more complete discussion of on-site drainage is included in the **Soils and Water Resources** section of this staff assessment.

ANALYSIS AND IMPACTS

GEOLOGICAL HAZARDS

Faulting And Seismicity

The project is located within seismic zone 4 as delineated on Figure 16-2 of the 1998 edition of the California Building Code. Energy Commission staff reviewed the California Division of Mines and Geology publications *Geologic Map of the Long Beach Sheet* dated 1985 (CDMGa 1985) and the *Fault Activity Map of California and Adjacent Areas with Locations and Ages of Recent Volcanic Eruptions*, dated 1994 (CDMGb 1994). The footprint where the bulk of the redevelopment project will take place is covered by Units 1 and 2 of the El Segundo Generating Station (ESGS). Energy Commission staff visited the ESGS on March 13, 2001 and on May 2, 2001, and did not observe any surface faulting at the project site. No active faults are known to cross the power plant footprint. A number of active faults lie within a 25-mile radius of the site. All of these faults are classified as Type B seismic sources, as defined in the 1997 Uniform Building Code and the 1998 California Building Code. These codes define 3 seismic source types: A, B, C. Type A faults, such as the San Andreas Fault System, are those with an average annual slip rate greater than 5 mm per year and the potential to generate a moment magnitude earthquake of at least 7.0. Type C faults are those with a slip rate of 2 mm or less per year and a maximum moment earthquake of less than 6.5. Type B faults, the largest grouping, are all faults not defined as Type A or C.

The closest active faults to the project are the Palos Verdes-Coronado Fault (2.1 miles southwest of the ESPR) and the North Branch of the Newport -Inglewood Fault Zone (7.3 miles northeast of the ESPR). The North Branch of the Newport-Inglewood Fault Zone is a right lateral strike slip fault with a slip rate of approximately 1 mm/year (International Conference of Building Officials, 1998, Page XV). The Newport-Inglewood Fault Zone has the potential to generate a magnitude 6.9 or greater. The Palos Verdes-Coronado fault is a northwest-trending, right-lateral strike-slip fault capable of generating a moment magnitude 7.1 earthquake and has an average slip rate of 3 millimeters per year. Other faults near the project site include the Santa Monica Fault and the Whittier segment of the Elsinore fault. The Santa Monica fault and the Whittier segment of the Elsinore fault are capable of earthquakes with a magnitude similar in size to the Newport-Inglewood Fault Zone. The Santa Monica fault trends northeast and lies approximately 12 miles north of the ESPR. The Whittier segment of the Elsinore fault, which trends northwest, is located over 23 miles east of the ESPR. The Whittier segment of the Elsinore fault has shown right-lateral strike-slip displacement with an average slip rate of 2.5 mm per year. The Santa Monica fault has a slip rate of 1 mm per year with left-lateral reverse-oblique movement.

CEC staff understands that the existing power plant was in operation during both the Sylmar moment magnitude 6.4 earthquake and Northridge moment magnitude 6.7 earthquake. Furthermore, the plant was not damaged in the Sylmar earthquake and only had minor damage to a wall adjacent to the bike path during the Northridge earthquake. The applicant has estimated that the peak horizontal ground acceleration for the design earthquake (with a 10 percent probability in 50 years return interval) is

0.46g (EPSR 2000a, page 5.3-21). CEC staff has reviewed a recent publication by the Seismological Society of America (Field 2000) related to estimating the ground acceleration in southern California. Although many theories and ideas are presented, none are sufficiently developed yet for use in engineering design. Consequently, the proposed peak horizontal ground acceleration of 0.46g remains appropriate. A peak horizontal ground acceleration of this intensity could cause instability of the existing cut slope and liquefaction of ESPR foundation soils, depending on the soil conditions actually present. These concerns will be addressed as a result of proposed **Conditions of Certification GEO-2** and **GEO-3** below. The ESPR proposes to replace structures designed under much older building codes with structures designed under current earthquake standards.

Liquefaction, Hydrocompaction, Subsidence, And Expansive Soils

Liquefaction is a condition in which a cohesionless or even slightly plastic soil may lose shear strength due to a sudden increase in pore water pressure. Four of the parameters used to assess the potential for liquefaction are the density, depth to ground water, texture, and the peak horizontal ground acceleration estimated for the site. The depth to ground water at the project is approximately 10 feet below existing grade. The applicant has estimated that the peak horizontal ground acceleration for the design earthquake (with a 10 percent chance in 50 years return interval) is 0.46g, which may be high enough, when combined with the shallow ground water and locally loose sands, to trigger liquefaction at the project site. The Applicant has acknowledged that the site is located in an area with moderate to high liquefaction potential. The project site is located in an area mapped as liquefaction hazard zone (CDMGc, 1999a). Energy Commission staff recommend that the Applicant conduct a detailed liquefaction analysis of the project site and linear facilities prior to the completion of the final design for the project. This is the subject of the proposed **Condition of Certification GEO-2** below.

Hydrocompaction is the process of the loss of soil volume upon the application of water. The fill at the site varies in consistency from loose to dense and is saturated below the water table. The potential for significant compaction due to hydrocompaction is considered remote since the ground water table at the site is shallow.

Subsidence of surficial and near-surface soil units may be induced at the site by either strong ground shaking due to a large nearby earthquake, by consolidation of loose or soft soils due to heavy loading of the soils by large structures, or by the extraction of fluids from the subsurface. Subsidence due oil extraction is a regional problem that has been partially mitigated by the injection of water into the subsurface. The injection of water into the subsurface has also been regionally used to prevent the intrusion of seawater into local aquifers north of the project. Subsidence due to ground water withdrawal has not been a major problem in the area – partially because sea water often replaces the fresh water that is pumped from the aquifer. Both subsidence stabilization and the salt-water intrusion mitigation have been moderately successful. Water injection is not anticipated as part of the proposed ESPR project.

Soils that contain a high percentage of expansive clay minerals are prone to expansion if subjected to an increase in water content. Expansive soils are usually measured with an index test such as the expansive index potential. In order for a soil to be a candidate for testing, the soil must have a high clay content and the clay must have a high shrink-

swell potential and a high plasticity index. No test results for the shrink-swell potential, expansive index potential, or the consolidation or bearing capacity of the soils has been submitted to the Energy Commission. The Applicant has indicated in the AFC that the only suspected expansive clay soils lie well below the water table, making shrink-swell very unlikely. Prior to the final design of the foundation for the (ESPR) the Applicant must have a foundation investigation report conducted and reviewed by the CBO per **Conditions of Certification GEO-5**.

Landslides

No landslides were observed on or adjacent to the proposed power plant footprint during a staff site visit on March 13, 2001, and a second site visit on May 2, 2001. A shallow, minor, slump was observed in the cut slope near the project administration building. The applicant proposes to evaluate slope stability during conduct of engineering geological/geotechnical investigations, as required under the proposed **Condition for Certification GEO-3**.

Coastal Conditions

Landward erosion is a constant force acting on any shoreline. Erosion and deposition at the shoreline are complex, dynamic processes involving a number of variables that may interact with each other in a chaotic manner. Beaches in this area are largely artificial, the result of a series of beach nourishment projects between 1938 and 1984 (Egense 1989). A groin was constructed by Chevron in the late 1980's to protect an oil pipeline (ESPR 2000a).

In 1988 a "Great Storm" struck the California Coast, including the El Segundo Area (Seymour 1989). By sheer coincidence, a shallow-water beach profiling survey had been completed around the Chevron rock groin at ESGS the day before. A subsequent survey was performed 4 days after the peak storm waves and then periodically for about 9 months. North of the groin beach erosion ranged from 20 to 63 cubic yards per linear foot. South of the groin the erosion was much less at 4 to 10 cubic yards per linear foot; however, the beach eroded back to the bicycle path and the rock revetment. The revetment was damaged in numerous locations (Armstrong and Flick 1984). Within 9 months the beach north of the groin had recovered over 90 percent of the lost volume. South of the Chevron groin, beaches were artificially nourished right after the storm and were not monitored (Egense 1989). Due to the presence of a significantly narrower beach south of the groin, the likelihood of wave run-up to the property may be considered moderate to high (ESPR 2000a).

Beach and revetment maintenance are the responsibility of Los Angeles County. Limited historical data for coastal conditions along the El Segundo shoreline indicate that the project site may be subjected to extreme storm swell and sea conditions in conjunction with astronomical high tides (ESPR 2000a). To address shoreline erosion concerns, the applicant has proposed **Condition of Certification GEO-4**, to design and conduct a shoreline monitoring program lasting a minimum of 10 years.

Flooding

The existing ESGS is afforded considerable protection from storm damage by the existing Chevron rock groin, an existing rock revetment, and an existing 10-foot-high masonry seawall, parallel to Units 3 and 4. It is our understanding that the groin and

revetments were built in 1983-1984 in response to severe storms during the previous winter, 1982-1983. There is no known documentation of any damage to the plant following that series of storms and prior to the construction of the shoreline protective structures (Egense, 1989). Conversations with on-site plant personnel (Pearson 2001, personal communication) have indicated that some wave run-up did enter the plant site through a chain link fence during the storm in mid-January 1988; however, overtopping of the seawall was not observed. We understand that damage was limited to deposition of water and sand in parking lot areas, south and possibly east of the generating equipment. A series of articles published in the journal *Shore and Beach* (Seymore 1989) indicate that the storms of January 16-18, 1988 were an anomaly, which combined high tides and storm generated waves to a pre-existing, very high swell condition. The computed annual return period of the observed wave conditions, for the 1988 storms was computed as 400 to 500 years (Seymour 1989). In a memorandum dated July 29, 1992, the California Coastal Commission indicated that the design storm is the winter storm of 1982-1983, such that the "Great Storm" of 1988 must be considered an unusual event.

It is our understanding that the applicant is proposing no modifications to the existing rock revetment or rock groin. The existing masonry seawall, also known as the western perimeter wall, is proposed to be extended to the north and south, with the height of the new wall matching the existing at approximately 10 feet. The current top-of-wall elevation is approximately 30 feet above mean sea level, and about 10 feet above ground elevation at the ESGS. It is important that any modifications or additions to this wall be properly designed to withstand the adverse coastal conditions expected at this site. Conditions for construction of additional seawall are addressed under **Condition of Certification GEO-6**.

Tsunami

A tsunami is a wave of water that may be generated by an earthquake or a large underwater landslide. The epicenter of the March 10, 1933 Long Beach earthquake was located in the Pacific Ocean, approximately 3.5 miles southwest of Newport Beach (39 miles southwest of the project site). Wood recorded that no tsunami was observed after this earthquake (Wood 1933). Studies cited by the applicant predict that tsunami upwelling would be between 5.5 and 9.4 feet, respectively, for the 100 and 500 year return periods. At high tide the tsunami run-up could be as high as +12 to +16 feet above MLLW. Since the site lies at approximately 19 feet above MLLW, and might be afforded some protection by the existing sea wall, no significant impacts from a tsunami are anticipated at EPSR.

GEOLOGICAL AND PALEONTOLOGICAL RESOURCES

The project is located approximately one mile west of the El Segundo Oil Field and one-half mile south of a single producing oil well owned by Occidental Petroleum. The project location is designated as Mineral Resources Zone-3, an area of undetermined mineral resources potential (CDMGd 1987). No mineral resources are known to have been identified at the present site and there are no significant sand or gravel mines in the area.

Energy Commission staff has reviewed the paleontological resources technical report and section 5.8 (EPSR2000a). The project site is highly disturbed and partially covered by artificial fill. No significant paleontological resources were reported by the applicant's paleontologist during the paleontological archive and literature reviews. The paleontologist did assign the power plant site a high sensitivity rating. No paleontological resources were observed by Energy Commission staff at the project site during site visits on March 13 and May 2, 2001. Energy Commission staff has proposed **Conditions of Certification, PAL-1 through PAL-7**, that will enable the applicant to mitigate impacts upon paleontological resources to a less than significant level should they be encountered during construction, operation, and closure of the project. The primary area of concern is the proposed 1.5:1 cut slope around the foundation zone of Units 1 and 2.

SURFACE WATER HYDROLOGY

The site and the entire El Segundo area is located in an area designated as Zone C by the Federal Emergency Management Agency (Community I.D. No. 060118). The designation means that the site is located in an area of minimal flooding potential for the 100-year storm. Minimum grade for the power plant area will be 1 percent and all drainage will be directed away from structures. The design storm event is the 100-year 24-hour storm (NOAA 1973), with a precipitation of approximately 7 inches. Drainage at the site is sheet flow to the south where it is collected into a general-purpose retention basin. The proposed surface water drainage system is anticipated to be able to accommodate the surface water run-off from the project site.

SITE SPECIFIC IMPACTS

No known geological resources will be impacted by the construction and operation of the project. Since there is to be little new grading, Energy Commission staff consider that the probability that significant paleontological resources will be encountered during the retooling of the power plant is minimal. Some re-grading (cut and fills) will be required for a new access road along the western side of the tank farm. Cut and fill slopes and grading requirements should be addressed in the design-level engineering geologic report recommended under Condition of Certification **GEO-5**.

CUMULATIVE IMPACTS

It is staff's opinion that the potential for a significant adverse cumulative impact on paleontological resources, geological resources, or surface water hydrology is unlikely if the project is constructed according to the proposed conditions of certification. It is noted that the site is located near the El Segundo Oil Field; however, construction and operation of the ESPR would not be expected to affect the oil field or vice versa.

FACILITY CLOSURE

A definition and general approach to facility closure is presented in the **General Conditions** section of this document. Facility closure activities are not anticipated to impact geological or paleontological resources. This is due to the fact that no paleontological or geological resources are known to exist at the power plant location. In addition, decommissioning and closure of the power plant should not negatively affect

geological or paleontological resources since the majority of the ground disturbed in plant decommissioning and closure would have been disturbed in the construction and operation of the plant. Surface water hydrology impacts will depend upon the closure activities proposed and can only be addressed when those activities are planned.

RESPONSE TO PUBLIC AND AGENCY COMMENTS

Energy Commission staff received one set of comments from the California Coastal Commission. These comments are related to:

- Stability of the cut slope on the east edge of the plant;
- Coastal erosion;
- Liquefaction;
- Flooding and the western containment structures.

The applicant has satisfactorily addressed these concerns specifically in Data Responses dated April 18 and May 4, 2001.

MITIGATION

No mitigation for geological hazards, geological resources or paleontological resources is proposed, other than the Conditions of Certification presented below. Conditions of Certification for surface water hydrology are presented elsewhere in this document **under Soil and Water Resources.**

CONCLUSIONS AND RECOMMENDATIONS

The applicant will likely be able to comply with applicable LORS. The project should have no adverse impact with respect to geological and paleontological resources and surface water hydrology. Staff proposes to ensure compliance with applicable LORS for geological hazards and surface water hydrology and potential paleontological resources with the adoption of the proposed conditions of certification listed below. No Conditions of Certification for geological resources are proposed since there are no known surficial geological resources at the site.

CONDITIONS OF CERTIFICATION

Some of the Conditions of Certification in this section have been changed from the PSA based on staff's efforts to standardize Conditions of Certification to the extent feasible based on recent experience in the certification and compliance process. These changes do not affect the substance of the requirements in the Condition. Other Conditions have been changed based on stipulated agreements between staff and the applicant. All of the modified Conditions are supported by the analysis outlined in the text above.

GEO-1 Prior to the start of construction, the project owner shall assign to the project an engineering geologist(s) and a geotechnical engineer(s) certified by

the State of California, to carry out the duties required by the 1998 edition of the California Building Code (CBC) Appendix Chapter 33, Section 3309.4. The certified engineering geologist(s) and geotechnical engineer(s) assigned must be approved by the CBO and submitted to the Compliance Project Manager (CPM) for concurrence.

At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CPM prior to the start of construction, the project owner shall submit to the CBO for approval the resume and license number(s) of the certified engineering geologist(s) and geotechnical engineer(s) assigned to the project. The submittal should include a statement that CPM concurrence is needed.

The CBO and CPM will approve or disapprove of the engineering geologist(s) and geotechnical engineer(s) and will notify the project owner of its findings within 15 days of receipt of the submittal. If the engineering geologist(s) and geotechnical engineer(s) are subsequently replaced, the project owner shall submit for approval the resume(s) and license number(s) of the newly assigned individual(s) to the CBO and CPM. The CBO and CPM will approve or disapprove of the engineering geologist(s) and geotechnical engineer(s) and will notify the project owner of the findings within 15 days of receipt of the notice of personnel change.

GEO-2 Prior to the initiation of ground disturbance, the owner shall have a liquefaction analysis conducted for the power plant site and adjacent existing cut slope to the east. The liquefaction analysis shall be implemented by following the recommended procedures contained in *Recommended Procedures for Implementation of California Division of Mines and Geology Special Publication 117, Guidelines for Analyzing and Mitigating Liquefaction Hazards in California* dated March 1999. (The document is available through the Southern California Earthquake Center at the University of Southern California.)

The project owner shall include in the application for a grading permit (see **Condition of Certification GEO-5**) a report of the liquefaction analysis and a summary of how the results of this analysis were incorporated into the project foundation and grading plan design for the CBO's review and comment. A copy of the liquefaction analysis and summary of incorporated results shall be sent to the CPM prior to grading.

GEO-3 Prior to completion of the final design of the project, the owner shall have a slope stability analysis conducted for the existing cut slope east of Units 1 and 2. The analysis shall consider both static and earthquake conditions, as well as the effects of any liquefaction of the foundation soils. Since cohesionless soils may be present, the proposed 1.5:1 perimeter excavation should also be evaluated for stability, but only for static conditions.

The project owner shall include in the application for a grading permit (see Condition of Certification **GEO-5** below) a report of the slope stability analysis and a summary of how the results of this analysis were incorporated into the project foundation and grading plan for the CBO's review and comment. A copy of the CBO's comments shall be sent to the CPM prior to grading.

GEO-4 Applicant shall designate and use a Coastal or Geotechnical Engineer, or geologist familiar with geomorphology, to conduct a shoreline monitoring program and assess erosion on the beach area and at the foot of the revetment

on an annual basis for at least ten years. Applicant shall report such results to the CPM and California Coastal Commission annually.

- A detailed baseline survey is required, along with some historical research including air photos, a summary of past beach nourishment and shoreline damage. Sand sampling and testing shall be conducted. A series of onshore/offshore shore-normal transects every few hundred feet shall be conducted 4 times per year. Annually, photos from set positions can be taken (e.g. from the groin and from a high elevation in the plant). Shoreline response during and after a major storm will be documented.

After ten continuous years of monitoring, the owner shall prepare and submit a final report. The final report will serve as the annual report for year ten and will include a summary of findings over the 10-year period. Based on the ten-year summary report, the final report will include recommendations for either:

- continued monitoring on an annual basis in accordance with the established protocol if there is evidence of an adverse shoreline erosion condition;
- modifications to the monitoring program and continuation of the program, if modifications are warranted to increase, decrease, otherwise adjust the type and frequency of data collected; or,
- suspension of monitoring due to absence of an adverse shoreline erosion condition related to construction and operation of the ESPR.

At least thirty days prior to commencing construction, the applicant shall designate the geologist and submit for approval the resumes of the engineer or geologist to the CBO and CPM. The engineer or geologist shall be experienced in shoreline monitoring, and understand coastal processes. Applicant shall submit as part of its annual compliance report the results of the assessment. Applicant shall also, at that time, forward the results to the California Coastal Commission and the City of El Segundo with a copy of the transmittal letter to the CPM. During the first 3 years following commencement of construction, the applicant shall submit the above mentioned quarterly reports. The tenth annual report shall contain the final report.

GEO-5The assigned engineering geologist(s) shall carry out the duties required by the 1998 CBC, Appendix Chapter 33, Section 3309.4 Engineered Grading Requirements, and Section 3318.1 - Final Reports. Those duties are:

- Prepare the Engineering Geology Report. This report shall accompany the Plans and Specifications when applying to the CBO for the grading permit.
- Monitor geologic conditions during construction.
- Prepare the Final Engineering Geology Report.
- The Engineering Geology Report required by the 1998 CBC Appendix Chapter 33, Section 3309.3 Grading Designation, shall include an adequate description of the geology of the site, conclusions, and recommendations

regarding the effect of geologic conditions on the proposed development, and an opinion on the adequacy of the site for the intended use as affected by geologic factors.

The Final Engineering Geology Report to be completed after completion of grading, as required by the 1998 CBC Appendix Chapter 33, Section 3318.1, shall contain the following: A final description of the geology of the site and any new information disclosed during grading; and the effect of same on recommendations incorporated in the approved grading plan. The engineering geologist shall submit a statement that, to the best of his or her knowledge, the work within their area of responsibility is in accordance with the approved Engineering Geology Report and applicable provisions of this chapter.

(1) Within 15 days after submittal of the application(s) for grading permit(s) to the CBO, the project owner shall submit a signed statement to the CPM stating that the Engineering Geology Report has been submitted to the CBO as a supplement to the plans and specifications and that the recommendations contained in the report are incorporated into the plans and specifications. (2) Within 90 days following completion of the final grading, the project owner shall submit copies of the Final Engineering Geology Report required by the 1998 CBC Appendix Chapter 33, Section 3318 Completion of Work, to the CBO and to the CPM.

GEO-6 The design for additional seawall or perimeter wall, including any necessary modifications to the existing seawall, shall be performed by a coastal engineer, geotechnical engineer, or engineering geologist, familiar with coastal processes and in accordance with the requirements of the California Coastal Commission Procedural Memo #19 (July 29, 1992).

Protocol: If additional seawall is installed, performance of the seawall, with respect to shoreline erosion, will need to be addressed and verified in the shoreline monitoring program described under **GEO-4**. The wall should be textured and colored appropriately to minimize visual impacts.

Verification: Once a seawall design plan is available, the applicant shall obtain approval of the design and construction methods from the CBO who will forward all approved plans and comments to the CPM. The CPM shall then forward this information to the Coastal Commission and the City of El Segundo.

PAL-1 The project owner shall provide the CPM with the resume and qualifications of its Paleontological Resource Specialist (PRS) and Paleontological Resource Monitors (PRMs) for review and approval. If the approved PRS or one of the PRMs is replaced prior to completion of project mitigation and report, the project owner shall obtain CPM approval of the replacement.

The resume shall include the names and phone numbers of contacts. The resume shall also demonstrate to the satisfaction of the CPM, the appropriate education and experience to accomplish the required paleontological resource tasks.

Protocol:

As determined by the CPM, the PRS shall meet the minimum qualifications for a vertebrate paleontologist as described in the Society of Vertebrate Paleontologists (SVP) guidelines of 1995. The experience of the PRS shall include the following:

- 1) institutional affiliations or appropriate credentials and college degree;
- 2) ability to recognize and recover fossils in the field;
- 3) local geological and biostratigraphic expertise;
- 4) proficiency in identifying vertebrate and invertebrate fossils;
- 5) publications in scientific journals; and
- 6) the PRS shall have at least three years of paleontological resource mitigation and field experience in California, and at least one year of experience leading paleontological resource mitigation and field activities.

The PRS shall obtain qualified paleontological resource monitors to monitor as necessary on the project. Paleontologic resource monitors (PRMs) shall have the equivalent of the following qualifications:

- 1) BS or BA degree in geology or paleontology and one year experience monitoring in California; or
- 2) AS or AA in geology, paleontology or biology and four years experience monitoring in California; or
- 3) Enrollment in upper division classes pursuing a degree in the fields of geology or paleontology and two years of monitoring experience in California.

Verification

1. At least 60 days prior to the start of ground disturbance, the project owner shall submit a resume and statement of availability of its designated PRS for on-site work.
2. At least 20 days prior to ground disturbance, the PRS or project owner shall provide a letter with resumes naming anticipated monitors for the project and stating that the identified monitors meet the minimum qualifications for paleontological resource monitoring required by the condition. If additional monitors are obtained during the project, the PRS shall provide additional letters and resumes to the CPM for approval. The letter shall be provided to the CPM no later than one week prior to the monitor beginning on-site duties.
3. Prior to the termination or release of a PRS, the project owner shall submit the resume of the proposed new PRS to the CPM for review and approval.

PAL-2The project owner shall provide to the PRS and the CPM, for approval, maps and drawings showing the footprint of the power plant and all linear facilities. Maps shall identify all areas of the project where ground disturbance is anticipated. If the PRS requests enlargements or strip maps for linear facility routes, the project owner shall provide copies to the PRS and CPM. The site grading plan and the plan and profile drawings for the utility lines would normally be

acceptable for this purpose. The plan drawings should show the location, depth, and extent of all ground disturbances and can be 1 inch = 40 feet to 1 inch = 100 feet range. If the footprint of the power plant or linear facility changes, the project owner shall provide maps and drawings reflecting these changes to the PRS and CPM.

If construction of the project will proceed in phases, maps and drawings may be submitted prior to the start of each phase. A letter identifying the proposed schedule of each project phase shall be provided to the PRS and CPM. Prior to work commencing on affected phases, the project owner shall notify the PRS and CPM of any construction phase scheduling changes.

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

Verification:

1. At least 30 days prior to the start of ground disturbance, the project owner shall provide the maps and drawings.
2. If there are changes to the footprint of the project, revised maps and drawings shall be provided at least 15 days prior to the start of ground disturbance.
3. If there are changes to the scheduling of the construction phases, the project owner shall submit a letter to the CPM within 5 days of identifying the changes.

PAL-3The PRS shall prepare, and the project owner shall submit to the CPM for review and approval, a Paleontological Resources Monitoring and Mitigation Plan (PRMMP) to identify general and specific measures to minimize potential impacts to significant paleontological resources. Approval of the PRMMP by the CPM shall occur prior to any ground disturbance. The PRMMP shall function as the formal guide for monitoring, collecting and sampling activities and may be modified with CPM approval. This document shall be used as a basis for discussion in the event that on-site decisions or changes are proposed. Copies of the PRMMP shall reside with the PRS, each monitor, the project owner's on-site manager, and the CPM.

The PRMMP shall be developed in accordance with the guidelines of the Society of the Vertebrate Paleontologists (SVP, 1995) and shall include, but not be limited to, the following:

- 1) Assurance that the performance and sequence of project-related tasks, such as any literature searches, pre-construction surveys, worker environmental training, fieldwork, flagging or staking; construction monitoring; mapping and data recovery; fossil preparation and recovery; identification and inventory; preparation of final reports; and transmittal of materials for curation will be performed according to the PRMMP procedures;

- 2) Identification of the person(s) expected to assist with each of the tasks identified within the PRMMP and all conditions for certification;
- 3) A thorough discussion of the anticipated geologic units expected to be encountered, the location and depth of the units relative to the project when known, and the known sensitivity of those units based on the occurrence of fossils either in that unit or in correlative units;
- 4) An explanation of why, how, and how much sampling is expected to take place and in what units. Include descriptions of different sampling procedures that shall be used for fine-grained and coarse-grained beds;
- 5) A discussion of the locations of where the monitoring of project construction activities is deemed necessary, and a proposed schedule for the monitoring;
- 6) A discussion of the procedures to be followed in the event of a significant fossil discovery, including notifications;
- 7) A discussion of equipment and supplies necessary for recovery of fossil materials and any specialized equipment needed to prepare, remove, load, transport, and analyze large-sized fossils or extensive fossil deposits;
- 8) Procedures for inventory, preparation, and delivery for curation into a retrievable storage collection in a public repository or museum, which meets the Society of Vertebrate Paleontologists standards and requirements for the curation of paleontological resources; and
- 9) Identification of the institution that has agreed to receive any data and fossil materials recovered, requirements or specifications for materials delivered for curation and how they will be met, and the name and phone number of the contact person at the institution; and,
- 10) A copy of the paleontological conditions of certification.

Verification: At least thirty (30) days prior to ground disturbance, the project owner shall provide a copy of the PRMMP. The PRMMP shall include an affidavit of authorship by the PRS, and acceptance of the project owner evidenced by a signature.

PAL-4 Prior to ground disturbance and for the duration of construction, the project owner and the PRS shall prepare and conduct weekly CPM-approved training for all project managers, construction supervisors and workers who operate ground disturbing equipment or tools. Workers to be involved in ground disturbing activities in sensitive units shall not operate equipment prior to receiving worker training. The training program may be combined with other training programs prepared for cultural and biological resources, hazardous materials, or any other areas of interest or concern.

The Worker Environmental Awareness Program (WEAP) shall address the potential to encounter paleontological resources in the field, the sensitivity and importance of these resources, and the legal obligations to preserve and protect such resources. In-person training shall be provided for each new employee involved with ground disturbing activities, while these activities are occurring in

highly sensitive geologic units, as detailed in the PRMMP. The in-person training shall occur within four days following a new hire for highly sensitive sites and as established by the PRMMP for sites of moderate, low, and zero sensitivity. Provisions will be made to provide the WEAP training to workers not fluent in English.

The training shall include:

1. A discussion of applicable laws and penalties under the law;
2. For training in locations of high sensitivity, the PRS shall provide good quality photographs or physical examples of vertebrate fossils that may be expected in the area;
3. Information that the PRS or PRM has the authority to halt or redirect construction in the event of a discovery or unanticipated impact to a paleontological resource;
4. Instruction that employees are to halt or redirect work in the vicinity of a find and to contact their supervisor and the PRS or PRM;
5. An informational brochure that identifies reporting procedures in the event of a discovery;
6. A Certification of Completion of WEAP form signed by each worker indicating that they have received the training; and
7. A sticker that shall be placed on hard hats indicating that environmental training has been completed.

Verification:

1. At least 30 days prior to ground disturbance, the project owner shall submit the proposed WEAP including the brochure with the set of reporting procedures the workers are to follow.
2. At least 30 days prior to ground disturbance, the project owner shall submit the script and final video to the CPM for approval if the project owner is planning on using a video for interim training.
3. If an alternate paleontological trainer is requested by the owner, the resume and qualifications of the trainer shall be submitted to the CPM for review and approval. Alternate trainers shall not conduct training prior to CPM authorization.
4. The project owner shall provide in the Monthly Compliance Report the WEAP copies of the Certification of Completion forms with the names of those trained and the trainer for each training offered that month. The Monthly Compliance Report shall also include a running total of all persons who have completed the training to date.

PAL-5 The PRS and PRM(s) shall monitor consistent with the PRMMP, all construction-related grading, excavation, trenching, and augering in areas where potentially fossil-bearing materials have been identified. In the event that the PRS determines full time monitoring is not necessary in locations that were identified as potentially fossil-bearing in the PRMMP, the PRS shall notify and seek the concurrence of the CPM.

The PRS and PRM(s) shall have the authority to halt or redirect construction if paleontological resources are encountered. The project owner shall ensure that there is no interference with monitoring activities unless directed by the PRS. Monitoring activities shall be conducted as follows:

- 1) Any change of monitoring different from the accepted schedule presented in the PRMMP shall be proposed in a letter from the PRS and the project owner to the CPM prior to the change in monitoring. The letter shall include the justification for the change in monitoring and submitted to the CPM for review and approval.
- 2) PRM(s) shall keep a daily log of monitoring of paleontological resource activities. The PRS may informally discuss paleontological resource monitoring and mitigation activities with the CPM at any time.
- 3) The PRS shall immediately notify the project owner and the CPM of any incidents of non-compliance with any paleontological resources conditions of certification. The PRS shall recommend corrective action to resolve the issues or achieve compliance with the conditions of certification.
- 4) For any significant paleontological resources encountered, either the project owner or the PRS shall notify the CPM immediately (no later than the following morning after the find, or Monday morning in the case of a weekend) of any halt of construction activities.

Verification: The PRS shall prepare a summary of the monitoring and other paleontological activities that will be placed in the Monthly Compliance Reports. The summary will include the name(s) of PRS or monitor(s) active during the month; general descriptions of training and construction activities and general locations of excavations, grading, etc. A section of the report will include the geologic units or subunits encountered; descriptions of sampling within each unit; and a list of fossils identified in the field. A final section of the report will address any issues or concerns about the project relating to paleontologic monitoring including any incidents of non-compliance and any changes to the monitoring plan that have been approved by the CPM. If no monitoring took place during the month, the project shall include a justification in summary as to why monitoring was not conducted.

The PRS shall submit the summary of monitoring and paleontological activities in the Monthly Compliance Report.

PAL-6 The project owner, through the designated PRS, shall ensure the recovery, preparation for analysis, analysis, identification and inventory, the preparation for curation, and the delivery for curation of all significant paleontological resource materials encountered and collected during the monitoring, data recovery, mapping, and mitigation activities related to the project.

The project owner shall maintain in their compliance file copies of signed contracts or agreements with the designated PRS and other qualified research specialists. The project owner shall maintain these files for a period of three years after completion and approval of the CPM-approved PRR. The project owner shall be responsible to pay curation fees for fossils collected and curated as a result of paleontological monitoring and mitigation.

PAL-7 The project owner shall ensure preparation of a Paleontological Resources Report (PRR) by the designated PRS. The PRR shall be prepared following completion of the ground disturbing activities. The PRR shall include an analysis of the recovered fossil materials and related information and submitted to the CPM for review and approval.

The report shall include, but not be limited to, a description and inventory of recovered fossil materials; a map showing the location of paleontological resources encountered; determinations of sensitivity and significance; and a statement by the PRS that project impacts to paleontological resources have been mitigated.

Verification: Within ninety (90) days after completion of ground disturbing activities, including landscaping, the project owner shall submit the Paleontological Resources Report under confidential cover.

Certification of Completion of Worker
Environmental Awareness Program
POWER PLANT NAME (DOCKET #)

This is to certify these individuals have completed a mandatory California Energy Commission-approved Worker Environmental Awareness Program (WEAP). The WEAP includes pertinent information on Cultural, Paleontology & Biology Resources for all personnel (i.e. construction supervisors, crews and plant operators) working on-site or at related facilities. By signing below, the participant indicates that they understand and shall abide by the guidelines set forth in the Program materials. Please include this completed form in your Monthly Compliance Report.

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Cul Trainer: _____ Signature: _____ Date: ___/___/___
 Paleo Trainer: _____ Signature: _____ Date: ___/___/___
 Bio Trainer: _____ Signature: _____ Date: ___/___/___

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POWER PLANT EFFICIENCY

Testimony of Steve Baker

INTRODUCTION

The Energy Commission makes findings as to whether energy use by the El Segundo Power Redevelopment Project (the Project) will result in significant adverse impacts on the environment, as defined in the California Environmental Quality Act (CEQA). If the Energy Commission finds that the Project's consumption of energy creates a significant adverse impact, it must determine whether there are any feasible mitigation measures that could eliminate or minimize the impacts. In this analysis, staff addresses the issue of inefficient and unnecessary consumption of energy.

In order to support the Energy Commission's findings, this analysis will:

- determine whether the facility will likely present any adverse impacts upon energy resources;
- determine whether these adverse impacts are significant; and if so,
- determine whether feasible mitigation measures exist that would eliminate the adverse impacts, or reduce them to a level of insignificance.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS

FEDERAL

No federal laws apply to the efficiency of this project.

STATE

California Environmental Quality Act Guidelines

CEQA Guidelines state that the environmental analysis "...shall describe feasible measures which could minimize significant adverse impacts, including where relevant, inefficient and unnecessary consumption of energy" (Cal. Code Regs., tit. 14, § 15126.4(a)(1)). Appendix F of the Guidelines further suggests consideration of such factors as the project's energy requirements and energy use efficiency; its effects on local and regional energy supplies and energy resources; its requirements for additional energy supply capacity; its compliance with existing energy standards; and any alternatives that could reduce wasteful, inefficient and unnecessary consumption of energy (Cal. Code regs., tit. 14, § 15000 et seq., Appendix F).

LOCAL

No local or county ordinances apply to power plant efficiency.

SETTING

El Segundo Power II LLC (ESP2) proposes to construct and operate a nominal 630 MW combined cycle merchant power plant to generate baseload and peaking power, selling directly to customers through bilateral contracts or on the spot market (ESPR 2000a, AFC §§ 1.1, 3.1, 3.10.2, 4.2, 4.3, 4.5.1). This nominal rating is based upon preliminary design information and generating equipment manufacturers' guarantees. The project's actual maximum generating capacity will differ from, and may exceed, this figure. The Project will consist of two General Electric PG7241FA combustion turbine generators with evaporative inlet air coolers and steam injection producing approximately 172 to 183 MW each, two heat recovery steam generators (HRSGs) with duct burners, and one 288 MW reheat steam turbine generator, arranged in a two-on-one combined cycle train, totaling approximately 630 MW. The gas turbines and HRSGs will be equipped with dry low-NOx combustors and selective catalytic reduction to control air emissions (ESPR 2000a, AFC §§ 1.1, 1.3.2, 3.4.1, 3.4.3.1, 3.4.3.2, 3.10.2.1, 5.19.7). The Project includes demolition and removal of El Segundo Generating Station (ESGS) Units 1 and 2, a pair of 1950s vintage 175 MW steam boiler units (ESPR 2000a, AFC §§ 1.1, 1.2, 1.3.2, 3.1, 3.4.1).

ANALYSIS

ADVERSE IMPACTS ON ENERGY RESOURCES

The inefficient and unnecessary consumption of energy, in the form of non-renewable fuels such as natural gas and oil, constitutes an adverse environmental impact. An adverse impact can be considered significant if it results in:

- adverse effects on local and regional energy supplies and energy resources;
- a requirement for additional energy supply capacity;
- noncompliance with existing energy standards; or
- the wasteful, inefficient and unnecessary consumption of fuel or energy.

Project Energy Requirements and Energy Use Efficiency

Any power plant large enough to fall under Energy Commission siting jurisdiction will consume large amounts of energy. The Project will burn natural gas at a nominal rate up to 108 billion Btu per day lower heating value (LHV) (ESPR 2000a, AFC Figure 3.4-1). This is a substantial rate of energy consumption, and holds the potential to impact energy supplies.

Under expected project conditions, electricity will be generated at a full load efficiency up to approximately 55.4 percent LHV (ESPR 2000a, AFC Table 5.19-1; § 5.19.7.1); compare this to the average fuel efficiency of a typical utility company baseload power plant at approximately 35 percent LHV.

Adverse Effects on Energy Supplies and Resources

The applicant has described its sources of supply of natural gas for the Project (ESPR 2000a, AFC §§ 1.1, 3.1, 3.4.6, 5.19.4.1). The project will burn natural gas from the

existing Southern California Gas Company (SoCalGas) pipeline that currently serves the ESGS. The SoCalGas gas supply infrastructure is extensive, offering access to vast reserves of gas from California, the Rocky Mountains, Canada and the Southwest. It is therefore highly unlikely that the Project could pose a substantial increase in demand for natural gas in California.

Additional Energy Supply Requirements

Natural gas fuel will be supplied to the project by the existing 20-inch diameter pipeline by which SoCalGas serves the ESGS (ESPR 2000a, AFC §§ 1.1, 3.1, 3.4.6, 5.19.4.1). SoCalGas claims that this line should provide adequate access to natural gas fuel. There is no real likelihood that the Project will require the development of additional energy supply capacity.

Compliance with Energy Standards

No standards apply to the efficiency of the Project or other non-cogeneration projects.

Alternatives to Reduce Wasteful, Inefficient and Unnecessary Energy Consumption

The Project could be deemed to create significant adverse impacts on energy resources if alternatives existed that would reduce the project's use of fuel. Evaluation of alternatives to the project that could reduce wasteful, inefficient or unnecessary energy consumption first requires examination of the project's energy consumption. Project fuel efficiency, and therefore its rate of energy consumption, is determined by the configuration of the power producing system and by the selection of equipment used to generate power.

Project Configuration

The Project will be configured as a compound-train combined cycle power plant, in which electricity is generated by two gas turbines, and additionally by a reheat steam turbine that operates on heat energy recuperated from the gas turbines' exhaust (ESPR 2000a, AFC §§ 1.1, 1.3.2, 3.1, 3.4.1, 4.5, 5.19.7). By recovering this heat, which would otherwise be lost up the exhaust stacks, the efficiency of any combined cycle power plant is increased considerably from that of either gas turbines or steam turbines operating alone. Such a configuration is well suited to the large, steady loads met by a baseload plant, intended to supply energy efficiently for long periods of time.

The number of turbines further contributes to efficiency at part load. Gas turbine generators operate most efficiently at one particular output level, typically at full load. Whenever desired output is less than full load, the unit must be throttled back. Rather than being forced to throttle back one large turbine, with the consequent reduction in efficiency, the power plant operator will have the option of shutting off one gas turbine.

Equipment Selection

Modern gas turbines embody the most fuel-efficient electric generating technology available today. The F-class gas turbines to be employed in the Project represent some of the most modern and efficient such machines now available. The applicant will employ two General Electric PG7241FA (Frame 7FA) gas turbine generators in a two-on-one combined cycle power train (ESPR 2000a, AFC §§ 1.1, 1.3.2, 3.1, 3.4.1, 5.19.7).

Known as the S207FA, this configuration is nominally rated at and 56.5 percent efficiency LHV at ISO¹ conditions (GTW 1999b).

One possible alternative machine is the ABB Alstom Power KA 24, an F-class gas turbine nominally rated at 271 MW and 57.6 percent efficiency at ISO conditions in a one-on-one combined cycle configuration (GTW 1999b).

Another alternative is the Siemens-Westinghouse 501F, nominally rated in a two-on-one combined cycle at 550 MW and 55.8 percent efficiency LHV at ISO conditions. This machine is functionally equivalent to the GE Frame 7FA.

While the KA 24 promises slightly higher fuel efficiency (57.6 percent at ISO conditions) (GTW 1999b) than the other F-class machines, any differences among the three in actual operating efficiency will be insignificant. Selecting among these machines is thus based on other factors, such as generating capacity, cost, ability to meet air pollution limitations, and commercial availability. The ABB machine, for instance, is available only in one-on-one power trains, with one gas turbine and one steam turbine paired on a single shaft, generating a nominal 271 MW (Orsini 1999, pers. comm.). The GE and Siemens-Westinghouse machines, which can be configured more flexibly, offer an advantage.

Efficiency of Alternatives to the Project

The project objectives include the flexibility to generate baseload and peaking power for sale on the spot market or via bilateral contracts (ESPR 2000a, AFC §§ 1.1, 3.1, 3.10.2, 4.2, 4.3, 4.5.1).

Alternative Generating Technologies

The applicant addresses alternative generating technologies in its application (ESPR 2000a, AFC §§ 4.3, 4.5, 4.7). Natural gas- and coal-burning, nuclear fission, solar, wind, hydroelectric, biomass, fuel cell and geothermal technologies are all considered. One of the project's stated objectives is to compete as a merchant plant (ESPR 2000a, AFC §§ 3.1, 4.2, 4.3). Given the project objectives, location and air pollution control requirements, staff agrees with the applicant that only natural gas-burning technologies are feasible.

Natural Gas-Burning Technologies

Fuel consumption is one of the most important economic factors in selecting an electric generator. Fuel typically accounts for over two-thirds of the total operating costs of a fossil-fired power plant (Power 1994). Under a competitive power market system, where operating costs are critical in determining the competitiveness and profitability of a power plant, the plant owner is thus strongly motivated to purchase fuel efficient machinery.

¹ International Standards Organization (ISO) standard conditions are 15°C (59°F), 60 percent relative humidity, and one atmosphere of pressure (equivalent to sea level).

Capital cost is also important in selecting generating machinery. Recent progress in the development of large, stationary gas turbines, aided by the incorporation into these machines of technological advances made in the development of aircraft (jet) engines, has created a situation in which several large manufacturers compete vigorously to sell their machines. This, combined with the cost advantages of assembly-line manufacturing, has driven down the prices of these machines. Thus, the power plant developer can purchase a turbine generator that not only offers the lowest available fuel costs, but at the same time sells for the lowest per-kilowatt capital cost.

One possible alternative to an F-class gas turbine is a G-class machine, such as the Siemens-Westinghouse 501G gas turbine generator, which employs partial steam cooling to allow slightly higher temperatures, yielding greater efficiency. While the 501G is rated at 58 percent efficiency (GTW 1999b), 1.5 percentage points higher than the 7FA, the G machine in a one-on-one combined cycle produces 365 MW to the 7FA's two-on-one configuration at 530 MW. A 630 MW (nominal) power plant would thus be impractical; a 365 MW power plant, without redundant gas turbines, would restrict operating flexibility. Given the minor efficiency improvement promised by the G-class turbine, the likelihood that the plant may frequently be dispatched at less than full load, and the lack of a proven track record for the 501G, the applicant's decision to purchase F-class machines is a reasonable one.

Another possible alternative to the F-class gas turbine is an H-class machine. Claimed fuel efficiency is 60 percent LHV at ISO conditions (GTW 1999b). This high efficiency is achieved through a higher pressure ratio and higher firing temperature, made possible by cooling the initial turbine stages with steam instead of air. This first Frame 7H application is not expected to enter service until the end of 2002. Given the lack of proven performance, and the reduction in operating flexibility from fewer gas turbines (one 7H combined cycle would produce 400 MW), staff agrees with the applicant's decision to employ F-class machines.

A further choice of alternatives involves the selection of gas turbine inlet air cooling methods. The two commonly used techniques are the evaporative cooler and the chiller; both devices increase power output by cooling the gas turbine inlet air. A mechanical chiller can offer greater power output than the evaporative cooler on hot, humid days, but consumes electric power to operate its refrigeration process, thus slightly reducing overall net power output and, thus, overall efficiency. An absorption chiller uses less electric power, but necessitates the use of a substantial inventory of ammonia. An evaporative cooler boosts power output best on dry days; it uses less electric power than a mechanical chiller, possibly yielding slightly higher operating efficiency. The difference in efficiency among these techniques is relatively insignificant.

The applicant proposes to employ evaporative cooling (ESPR 2000a, AFC §§ 1.3.2, 3.4.1, 3.4.3.1, 3.10.2.1). Given the climate at the project site and the relative lack of clear superiority of one system over the other, staff agrees that the applicant's approach will yield no significant adverse energy impacts.

In conclusion, the project configuration (combined cycle) and generating equipment (F-class gas turbines) chosen appear to represent the most efficient feasible combination

to satisfy the project objectives. There are no alternatives that could significantly reduce energy consumption.

CUMULATIVE IMPACTS

There are no nearby power plant projects that hold the potential for cumulative energy consumption impacts when aggregated with the Project. Staff knows of no other projects that could result in cumulative energy impacts.

Staff believes that construction and operation of the Project will not bring about indirect impacts, in the form of additional fuel consumption, that would not have occurred but for the Project. California's electric power will be generated by those power plants that bid most successfully to sell their output to California's electricity market. Since no significantly more efficient power plants are envisioned to compete against the Project, no indirect impacts are likely.

FACILITY CLOSURE

Closure of the facility, whether planned or unplanned, will not influence, nor will it be influenced by, project efficiency. Any efficiency impacts due to closure of the project would be on the electric system as a whole. Yet the vast size of the electric system serving California, the number of generating plants offering to sell power into it, and the existence of the California Independent System Operator to ensure the efficient management of the system, all lend assurance that closure of this facility will not produce significant adverse impacts on efficiency.

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

The Project, if constructed and operated as proposed, would generate 630 MW of electric power at an overall project fuel efficiency around 55 percent. While it will consume substantial amounts of energy, it will do so in the most efficient manner practicable. It will not create significant adverse effects on energy supplies or resources, will not require additional sources of energy supply, and will not consume energy in a wasteful or inefficient manner. No energy standards apply to the project. Staff therefore concludes that the Project would present no significant adverse impacts upon energy resources.

No cumulative impacts on energy resources are likely. Facility closure would not likely present significant impacts on electric system efficiency.

RECOMMENDATION

From the standpoint of energy efficiency, staff recommends certification of the Project. No Conditions of Certification are proposed.

REFERENCES

- ESPR (El Segundo Power II LLC). 2000 a. Application for Certification for the El Segundo Power Redevelopment Project (00-AFC-14). Submitted to the California Energy Commission, December 21, 2000.
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POWER PLANT RELIABILITY

Testimony of Steve Baker

INTRODUCTION

In this analysis, Energy Commission staff addresses the reliability issues of the El Segundo Power Redevelopment project (ESPR) to determine if the power plant is likely to be built in accordance with typical industry norms for reliability of power generation. Staff uses this level of reliability as a benchmark because the resulting project would likely not degrade the overall reliability of the electric system it serves (see **Setting** below).

The scope of this power plant reliability analysis covers:

- equipment availability;
- plant maintainability;
- fuel and water availability; and
- power plant reliability in relation to natural hazards.

Staff examined the project design criteria to determine if the project is likely to be built in accordance with typical industry norms for reliability of power generation. While El Segundo Power II LLC (ESPII) has predicted a level of reliability for the power plant (see below), staff believes ESPII should not be held responsible for achieving this goal, so long as the plant's reliability matches or exceeds that of similar plants.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS

Presently, there are no laws, ordinances, regulations or standards (LORS) that establish either power plant reliability criteria or procedures for attaining reliable operation. However, the commission must make findings as to the manner in which the project is to be designed, sited and operated to ensure safe and reliable operation (Cal. Code Regs., tit. 20, § 1752(c)). Staff takes the approach that a project is acceptable if it does not degrade the reliability of the utility system to which it is connected. This is likely the case if the project exhibits reliability at least equal to that of other power plants on that system (see **Setting** below).

SETTING

In the regulated monopoly electric industry of past decades, the utility companies assured overall system reliability, in part, by maintaining a "reserve margin." This amounted to having on call, at all times, sufficient generating capacity, in the form of standby power plants, to quickly handle unexpected outages of generating or transmission facilities. The utilities generally maintained a seven- to ten-percent reserve margin, meaning that sufficient capacity was on call to quickly replace from seven to ten percent of total system resources. This margin proved adequate, in part because of the reliability of the power plants that constituted the system.

Now, in the restructured competitive electric power industry, the responsibility for maintaining system reliability falls largely to the California Independent System Operator (Cal-ISO), an entity that purchases, dispatches and sells electric power throughout the state. How Cal-ISO will ensure system reliability is still being determined; protocols are being developed and put in place that will, it is anticipated, allow sufficient reliability to be maintained under the competitive market system. “Must-run” power purchase agreements and “participating generator” agreements are two mechanisms being employed to ensure an adequate supply of reliable power.

The Cal-ISO also requires those power plants selling ancillary services, as well as those holding reliability must-run contracts, to fulfill certain requirements, including:

- filing periodic reports on plant reliability;
- reporting all outages and their causes; and
- scheduling all planned maintenance outages with the Cal-ISO.

The Cal-ISO’s mechanisms to ensure adequate power plant reliability apparently have been devised under the assumption that the individual power plants that compete to sell power into the system will each exhibit a level of reliability similar to that of power plants of past decades. However, there is cause to believe that, under free market competition, financial pressures on power plant owners to minimize capital outlays and maintenance expenditures may act to reduce the reliability of many power plants, both existing and newly constructed (McGraw-Hill 1994). It is possible that, if significant numbers of power plants exhibit individual reliability sufficiently lower than this historical level, the assumptions used by Cal-ISO to ensure system reliability will prove invalid, with potentially disappointing results. Until the restructured competitive electric power system has undergone a shakeout period, and the effects of varying power plant reliability are thoroughly understood and compensated for, staff deems it wise to encourage power plant owners to continue to build and operate their projects to the level of reliability to which all in the industry are accustomed.

ESPII proposes to operate the 630 MW (nominal output) ESPR at baseload, selling energy and capacity on the market and via bilateral contracts (ESPR 2000a, AFC §§ 1.2, 3.1, 3.10.2, 4.3, 5.19.2). The project is expected to operate at an overall availability in the mid-90 percent range (ESPR 2000a, AFC § 5.19.1.1), and at a capacity factor, over the life of the plant, of 60 to 65 percent (ESPR 2000a, AFC § 5.19.2).

ANALYSIS

A reliable power plant is one that is available when called upon to operate. Throughout its intended life, the ESPR will be expected to perform reliably in baseload duty. Power plant systems must be able to operate for extended periods (sometimes months on end) without shutting down for maintenance or repairs. Achieving this reliability is accomplished by ensuring adequate levels of equipment availability, plant maintainability, fuel and water availability, and resistance to natural hazards. Staff examines these factors for the project and compares them to industry norms. If they

compare favorably, staff can conclude that the ESPR will be as reliable as other power plants on the electric system, and will therefore not degrade system reliability.

EQUIPMENT AVAILABILITY

Equipment availability will be ensured by use of appropriate quality assurance/ quality control (QA/QC) programs during design, procurement, construction and operation of the plant, and by providing for adequate maintenance and repair of the equipment and systems (discussed below).

QA/QC Program

ESPII describes a QA/QC program (ESPR 2000a, AFC §§ 5.19.6, 5.19.6.2) typical of the power industry. Equipment will be purchased from qualified suppliers, based on technical and commercial evaluations. Suppliers' personnel, production capability, past performance, QA programs and quality history will be evaluated. The project owner will perform receipt inspections, test components, and administer independent testing contracts. Staff expects implementation of this program to yield typical reliability of design and construction. To ensure such implementation, staff has proposed appropriate conditions of certification under the portion of this document entitled **FACILITY DESIGN**.

PLANT MAINTAINABILITY

Equipment Redundancy

A generating facility called on to operate in baseload service for long periods of time must be capable of being maintained while operating. A typical approach for achieving this is to provide redundant examples of those pieces of equipment most likely to require service or repair.

ESPII plans to provide appropriate redundancy of function for the combined cycle portion of the project (ESPR 2000a, AFC §§ 1.1, 1.2, 3.1, 3.10.2.6.1, 3.10.2.7, 5.19.3.1, 5.19.3.2, 5.19.3.3; Appendix F). The fact that the project consists of two trains of gas turbine generators/HRSGs provides inherent reliability. Failure of a non-redundant component of one train should not cause the other train to fail, thus allowing the plant to continue to generate, though at reduced output. Further, the plant's distributed control system (DCS) will be built with typical redundancy. Emergency DC and AC power systems will be supplied by redundant batteries, chargers and inverters. Other balance of plant equipment will be provided with redundant examples, thus:

- two 100 percent boiler feed pumps;
- two 100 percent condensate pumps;
- four 25 percent ocean water cooling system pumps;
- two 100 percent demineralized water storage pumps;
- three 50 percent fuel gas compressors;
- two 100 percent fuel gas scrubber filters;

- two 100 percent service air compressors; and
- two 100 percent instrument air dryers.

With this opportunity for continued operation in the face of equipment failure, staff believes that equipment redundancy will be sufficient for a project such as this.

Maintenance Program

ESPII proposes to establish a plant maintenance program typical of the industry (ESPR 2000a, AFC §§ 3.10.2.2, 5.19.1.1, 5.19.1.2.2, 5.19.1.4, 5.19.6.3.1). Equipment manufacturers provide maintenance recommendations with their products; the applicant will base its maintenance program on these recommendations. For example, each gas turbine will be scheduled for annual inspections and cleaning at times of low electricity demand. Every third year, each gas turbine will undergo a hot gas path inspection. Every sixth year, each gas turbine will undergo a major maintenance turnaround. In light of these plans, staff expects that the project will be adequately maintained to ensure acceptable reliability.

FUEL AND WATER AVAILABILITY

For any power plant, the long-term availability of fuel and of water for cooling or process use is necessary to ensure reliability. The need for reliable sources of fuel and water is obvious; lacking long-term availability of either source, the service life of the plant may be curtailed, threatening the supply of power as well as the economic viability of the plant.

Fuel Availability

The ESPR will burn natural gas from the Southern California Gas Company (SoCalGas) system. Gas will be transmitted to the plant, via a new connection to the existing on-site metering station, from SoCalGas's existing 20-inch diameter pipeline (ESPR 2000a, AFC §§ 1.2, 3.4.6, 3.10.3, 5.19.4.1). This natural gas system, which provides access to gas from the Rocky Mountains, Canada and the Southwest, represents a resource of considerable capacity. This system offers access to adequate supplies of gas (ESPR 2000a, AFC § 5.19.4.1). Staff agrees with the applicant's prediction that there will be adequate natural gas supply and pipeline capacity to meet the project's needs.

Water Supply Reliability

The ESPR proposes to obtain water for cooling and other plant uses from three sources. Condenser cooling, which represents 99 percent of the plant's water consumption, will be via the existing ESGS Units 1 & 2 once-through ocean water cooling system. Potable water will be obtained from the City of El Segundo's municipal water system. HRSG makeup water will be from reclaimed water supplied by the West Basin Municipal Water District (ESPR 2000a, AFC §§ 1.2, 1.3.4, 3.1.3.4.4, 3.4.7, 3.7.2, 3.7.3, 3.10.3, 4.7.5.1, 5.19.5). Staff believes these sources yield sufficient likelihood of a reliable supply of water. For further discussion of water supply, see that portion of this document entitled **WATER RESOURCES**. The potential impacts of the use of ocean water for once-through cooling are discussed in the **BIOLOGICAL RESOURCES** section, and an evaluation of alternative cooling options is presented in an Appendix to that section.

POWER PLANT RELIABILITY IN RELATION TO NATURAL HAZARDS

Natural forces can threaten the reliable operation of a power plant. High winds, tsunamis (tidal waves) and seiches (waves in inland bodies of water) will not likely represent a hazard for this project, but flooding and seismic shaking (earthquake) present credible threats to reliable operation.

Flooding

The site elevation is 20 feet above mean sea level. With a proper grading and drainage plan and a new wall to the west of the site, there should be no credible threat of flooding (ESPR 2000a, AFC §§ 3.3.1, 3.5.10; Figure 3.5-1). For further discussion, see that portion of this document entitled **GEOLOGY AND PALEONTOLOGY**.

Seismic Shaking

The site lies within Seismic Zone 4 (ESPR 2000a, AFC §§ 3.3.2.2, 3.5.10, 3.12.3; Table 3.12-1); see that portion of this document entitled **GEOLOGY AND PALEONTOLOGY**. The project will be designed and constructed to the latest appropriate LORS. Compliance with current LORS applicable to seismic design represents an upgrading of performance during seismic shaking, compared to older facilities, due to the fact that these LORS have been periodically and continually upgraded. By virtue of being built to the latest seismic design LORS, this project will likely perform at least as well as, and perhaps better than, existing plants in the electric power system. Staff has proposed conditions of certification to ensure this; see that portion of this document entitled **FACILITY DESIGN**. In light of the historical performance of California power plants and the electrical system in seismic events, staff believes there is no special concern with power plant functional reliability affecting the electric system's reliability due to seismic events.

COMPARISON WITH EXISTING FACILITIES

Industry statistics for availability factors (as well as many other related reliability data) are kept by the North American Electric Reliability Council (NERC). NERC continually polls utility companies throughout the North American continent on project reliability data through its Generating Availability Data System (GADS), and periodically summarizes and publishes the statistics on the Internet (<http://www.nerc.com>). NERC reports the following summary generating unit statistics for the years 1994 through 1998 (NERC 1999):

For Combined Cycle units (All MW sizes)

Availability Factor = 91.49 percent

The gas turbines that will be employed in the project have been on the market for several years now, and can be expected to exhibit typically high availability. The applicant's prediction of an annual availability factor in the mid-90 percent range (ESPR 2000a, AFC § 5.19.1.1) appears reasonable compared to the NERC figure for similar plants throughout North America (see above). In fact, these new, large machines can well be expected to outperform the fleet of various (mostly older and smaller) gas turbines that make up the NERC statistics. Further, since the plant will consist of two parallel gas turbine generating trains, maintenance can be scheduled during those times of year when the full plant output is not required to meet market demand, typical

of industry standard maintenance procedures. The applicant's estimate of plant availability therefore appears realistic. The stated procedures for assuring design, procurement and construction of a reliable power plant appear to be in keeping with industry norms, and staff believes they are likely to yield an adequately reliable plant.

FACILITY CLOSURE

Closure of the facility, whether planned or unplanned, cannot impact project reliability. Reliability impacts on the electric system from facility closure, should there be any, are dealt with in that portion of this document entitled **TRANSMISSION SYSTEM ENGINEERING**.

CONCLUSION

ESPII predicts an equivalent availability factor in the mid-90 percent range, which staff believes is achievable in light of the industry norm of 91 percent for this type of plant. Based on a review of the proposal, staff concludes that the plant will be built and operated in a manner consistent with industry norms for reliable operation. This should provide an adequate level of reliability. No Conditions of Certification are proposed.

REFERENCES

- ESPR (El Segundo Power Station). 2000 a. Application for Certification, El Segundo Generating Station Redevelopment Project (00-AFC-14). Submitted to the California Energy Commission, December 18, 2000.
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TRANSMISSION SYSTEM ENGINEERING

Testimony of Mark Hesters and Al McCuen

INTRODUCTION

The Transmission System Engineering (TSE) analysis identifies whether or not the transmission facilities associated with the proposed project conform to all applicable laws, ordinances, regulations and standards (LORS) required for safe and reliable electric power transmission and assesses whether or not the applicant has accurately identified all interconnection facilities required as a result of the project.

Staff's analysis evaluates the power plant switchyard, outlet line, termination and downstream facilities identified by the applicant and provides proposed conditions of certification to ensure the project complies with applicable LORS during the design review, construction, operation and potential closure of the project.

Additionally, under the California Environmental Quality Act (CEQA), the Energy Commission must conduct an environmental review of the "whole of the action," that may include facilities not licensed by the Energy Commission (California Code of Regulations (CCR), Title 14, §15378). Therefore, the Energy Commission must identify and evaluate the environmental effect of construction and operation of any new or modified transmission facilities required for the project's interconnection to the electric grid and also beyond the project's interconnection with the existing transmission system that are required as a result of the power plant addition to the California transmission system. The California Independent System Operator (Cal-ISO) is responsible for ensuring electric system reliability for all participating transmission owning utilities and determines both the standards necessary to achieve reliability and whether a proposed project conforms with those standards. The Cal-ISO will provide testimony on these matters at the Energy Commission's hearings.

Summary of Conclusions

The El Segundo Power II LLC (ESP II or the applicant) proposes to connect their El Segundo Power Redevelopment Project (El Segundo Project or the project), to the existing 230 kV transmission system. The power plant switchyard, outlet lines, and terminations are in accordance with good utility practices and are acceptable. Staff concludes that these facilities will comply with LORS, assuming the Conditions of Certification **TSE-1** through **TSE-7** are met. The applicant has committed to a specific transmission mitigation alternative and no foreseeable, significant downstream facilities will be attributed to the interconnection and operation of the El Segundo Project.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS

California Public Utilities Commission (CPUC) General Order 95 (GO-95), "Rules for Overhead Electric Line Construction", formulates uniform requirements for construction of overhead lines. Compliance with this order ensures adequate service and safety to persons engaged in the construction, maintenance, operation or use of overhead electric lines and to the public in general.

CPUC General Order 128 (GO-128), "Rules for Construction of Underground Electric Supply and Communications Systems," establishes uniform requirements and minimum standards to be used for underground supply systems to ensure adequate service and safety.

Western Systems Coordinating Council (WSCC) Reliability Criteria provides the performance standards used in assessing the reliability of the interconnected system. These Reliability Criteria require the continuity of service to loads as the first priority and preservation of interconnected operation as a secondary priority. The WSCC Reliability Criteria includes the Reliability Criteria for Transmission System Planning, Power Supply Design Criteria, and Minimum Operating Reliability Criteria. Analysis of the WSCC system is based to a large degree on WSCC Section 4 "Criteria for Transmission System Contingency Performance" which requires that the results of power flow and stability simulations verify established performance levels. Performance levels are defined by specifying the allowable variations in voltage, frequency and loading that may occur on systems other than the one in which a disturbance originated. Levels of performance range from no significant adverse effect outside a system area during a minor disturbance (loss of load or facility loading outside emergency limits) to a performance level that only seeks to prevent system cascading and the subsequent blackout of islanded areas. While controlled loss of generation, load, or system separation is permitted in extreme circumstances, their uncontrolled loss is not permitted (WSCC 1998).

North American Electric Reliability Council (NERC) Planning Standards provide policies, standards, principles and guides to assure the adequacy and security of the electric transmission system. With regard to power flow and stability simulations, these Planning Standards are similar to WSCC's Criteria for Transmission System Contingency Performance. The NERC planning standards provide for acceptable system performance under normal and contingency conditions, however the NERC planning standards apply not only to interconnected system operation but also to individual service areas (NERC 1998).

Cal-ISO's Reliability Criteria also provide policies, standards, principles and guides to assure the adequacy and security of the electric transmission system. With regard to power flow and stability simulations, these Planning Standards are similar to WSCC's Criteria for Transmission System Contingency Performance and the NERC Planning Standards. The Cal-ISO Reliability Criteria incorporate the WSCC Criteria and NERC Planning Standards. However, the Cal-ISO Reliability Criteria also provide some additional requirements that are not found in the WSCC Criteria or the NERC Planning Standards. The Cal-ISO Reliability Criteria apply to all existing and proposed facilities interconnecting to the Cal-ISO controlled grid.

Cal-ISO Scheduling Protocols and Dispatch Protocols require conformance with NERC, WSCC, and Local Area Reliability and Planning Criteria. These standards will be applied to the assessment of the system reliability implications of the Unit 7 project. Also of major importance to projects are the Cal-ISO Day/Hour Ahead Inter-zonal Congestion Management Scheduling Protocol (SP 10), the Transmission System Loss Management Scheduling Protocol (SP 4), and the Creation of the Real Time Merit Order Stack (SP 11). The Congestion Management Scheduling Protocol provides that the operation of power plants not violate system criteria when market participants request generation dispatch or the use of major interties. The Real Time Merit Order

Stack is developed based on increasing energy bid prices so that the least cost bids are accepted early on and if congestion is anticipated the highest bids are not selected. The Transmission System Loss Management Scheduling Protocol uses the Cal-ISO power flow model to identify total transmission losses at each generating unit and scheduling point. Additional calculations are performed to determine the actual net power output required by the generating units to meet their scheduled obligations. (Cal-ISO 1998a, Cal-ISO 1998b).

Cal-ISO Participating Generator Agreement consists of detailed explanations of the requirements in the Cal-ISO Tariff pertaining to the paralleled generating unit.

PROJECT DESCRIPTION

The El Segundo project would result in a net increase in the output of the existing El Segundo Generating Station by 280 MW, with the 350 MW existing Units 1 and 2 replaced by the new Units 5, 6, and 7 with a nominal net output of 630 MW. Units 3 and 4 will be re-rated from 604 MW to 670 MW as a result of the project. New transmission facilities are limited to those on site that would connect the new generating facilities with the on-site El Segundo substation. No new transmission lines would be required for the project. Two new generator lead lines would connect the switchyard to the existing El Segundo substation, located on site. The 230 kV lead lines would connect the 230 kV transformers in the switchyard with existing 230 kV equipment in the El Segundo substation. While the interconnection and operation of the project would require the replacement of circuit breakers and wave traps in the Southern California Edison transmission network, no significant downstream facilities have been identified as a reasonably foreseeable consequence of the El Segundo Project.

POWER PLANT SWITCHYARD

The on-site switchyard would be designed to conform to applicable industry standards and would include three new generator step-up transformers. The 230 kV circuit breakers, disconnect switches and surge arrestors would be appropriately sized as determined by the Detailed Facilities Study. No major new equipment is required for the El Segundo substation to accommodate the project. The onsite facilities would be owned, operated and maintained by the project owners (ESPR 2000a). Staff concludes that these facilities are acceptable.

TRANSMISSION LINE

Two new generator lead lines would connect the project switchyard to the existing El Segundo substation, located on site. The applicant would use 230 kV lead lines to connect the 230 kV transformers in the switchyard with the existing 230 kV equipment in the El Segundo substation. The conductor would be bundled 765-kcmil ACSR, each of which can carry a maximum load of 607 MVA and is appropriate for the project requirements. No new off site transmission facilities would be required to interconnect the project.

EXISTING FACILITIES AND RELATED SYSTEMS

The applicant proposes to connect the project to the existing El Segundo substation in the SCE service territory. Thus the project would interconnect to the center of the SCE

transmission network. As shown in the System Impact and Facility Studies for the project the operation of the El Segundo Project would impact many transmission facilities in the SCE transmission network although no significant downstream facilities will be required.

DOWNSTREAM IMPACTS¹

The project impacts on the transmission system downstream of the interconnection facilities are discussed in the System Reliability section. No new or modified transmission facilities beyond the project's interconnection with the existing transmission system are identified as a result of the power plant addition to the California transmission system.

ANALYSIS

SYSTEM RELIABILITY

Introduction

A system reliability study is performed to determine the effects of connecting a new power plant to the existing electric grid. The study identifies impacts and also ways negative impacts can be minimized or negated. Any new transmission facilities such as the power plant switchyard, the outlet line, and downstream facilities, required to connect a project to the grid are considered part of the project and are subject to review in the Application for Certification process. Based on the results of the Facilities Study and the subsequent letter from the applicant, staff has determined that the El Segundo Project will not cause significant line overloads under normal conditions. Transmission lines do overload under normal and emergency or outage conditions, which will require mitigation, but significant downstream facilities will not be required.

Scope of Reliability Studies

Power flow, short circuit and stability studies with and without the project are performed to determine conformance with reliability criteria established by NERC, WECC, and the Cal-ISO. The project is modeled in the studies with an additional plant delivery of 280 MW for power flow analysis. The study results provide snapshots of highly stressed operation and are not illustrative of month to month or day to day operation. Power flow studies included generators and utility expansion plans and were based on the assumption that the projects would be completed and generating power in the late spring of 2003. The status of potential new generators has changed several times since the first Facility Study was completed for the El Segundo Project and several potential plants located near El Segundo are no longer viable. As a result, SCE has updated the Facility Study once for the El Segundo Project and an updated study was filed at the CEC on May 21, 2002. The 2003 cases used as a basis for the studies are considered valid for the purpose of the Cal-ISO and TSE analysis.

¹ Downstream facilities are those that are beyond the point where the line emanating from the power plant joins with the (existing) interconnected system (see [California Public Utilities Commission v. California Energy Resources Conservation and Development Commission](#) (1984) 150 Cal. App. 3d 437 [197 Cal. Rptr. 866]).

Facilities Study Summary

The power flow study results indicate that, under the stressed conditions studied, an extensive list of existing line overloads would be slightly increased due to the project. In addition, a limited number of heavily loaded facilities would reach overload conditions with the addition of the project. The study describes four mitigation alternatives for the identified overloads (ESPR 2002x, pages 5 and 6). The applicant has committed to alternative 3 which uses Special Protection Systems and replaces equipment such as wave traps and circuit breakers that are within the fence line of existing facilities (ESPR 2002gg, page 1). Thus, no new or modified transmission facilities beyond the project's interconnection with the existing transmission system would be required as a result of the power plant addition. New and increased overloads are listed in the summary that follows:

Load flow analysis for Spring 2003 Transmission System Planning Model conditions

1. Under N-0 conditions, addition of the project increases four pre-existing overloads.
2. The project triggers three new overloads for N-1 contingencies.
3. The project increases seven existing overloads for N-1 contingencies.
4. The project triggers two new overloads for N-2 contingencies.
5. The project increases five existing overloads for N-2 contingencies.

Load flow analysis for Heavy Summer 2003 conditions

1. Under N-0 conditions, addition of the project increases two pre-existing overloads.
2. The project triggers three new overloads for N-1 contingencies.
3. The project increases three existing overloads for N-1 contingencies.
4. The project triggers one new overload for N-2 contingencies.
5. The project increases five existing overloads for N-2 contingencies.

The above list shows that the project increases already existing overloads on a great number of lines. Since the upgrade of these existing overloads will be triggered by other power plant projects the facilities associated with the upgrades are not required for the interconnection and operation of the El Segundo Project and as such are not a reasonably foreseeable consequence of this project. Overloads that are directly attributable to the project are limited to contingency overloads that will be mitigated with Special Protection Systems (SPS) that would reduce the output from the El Segundo Project under specified conditions. Staff concludes that there are no major system additions, beyond the interconnection facilities, required as a reasonably foreseeable consequence of the project. The applicant states a commitment to a remedial action scheme (RAS) and project re-design to avoid overload conditions that would trigger the need for significant new physical upgrades (ESPR 2002gg, page 1).

Short Circuit Study Results

Short circuit analyses are conducted to assure that existing and proposed breaker ratings are sufficient to withstand high levels of current during a fault (such as when a line touches the ground). The short circuit duty analysis found that 22 circuit breakers would need to be replaced due to the El Segundo Project. All post transient voltages

were within planning criteria for the critical contingencies tested. Breaker work and any substation equipment replacement will occur inside the fence lines of the existing substation. The fault duty studies were based on parameters provided by the applicant. The results could be significantly different if the actual parameters differ substantially from the data used in the Facilities Study. However, since circuit breaker replacement and new relays are considered a “within the fence” change for the project, the determination of actual parameters until after the Energy Commission’s decision on project certification is acceptable (ESPR 2000i).

Stability Study Results

Stability studies were performed to ensure that the transmission system remains stable during normal and abnormal operating conditions with the project connected to the system. Dynamic stability analysis found no new unstable system condition with addition of the project for either spring or summer cases (ESPR 2000i).

Cal-ISO Review

The Cal-ISO review of the applicant’s submittals supports the CEC staff’s analysis, states preliminary interconnection approval, and recommends further study for the EL Segundo Project (Cal-ISO 2001a). The Facility Study identified an alternative that will mitigate overloads with SPS and will not require the upgrade of existing transmission lines. The ESP II may be required to pay for some part of the physical reinforcements that are required to alleviate overloads, however those reinforcements are triggered by other new generators and would be required even if the EI Segundo project is not approved. That is, the project will be required to contribute to cost sharing of system reinforcements, however will not be considered to have solely triggered the need for physical reinforcements. No significant new downstream project facilities are likely to be identified as required to accommodate the project in the additional studies. The Cal-ISO will provide testimony on the Facilities Study Report and Supplemental Studies, will discuss the conclusions and analysis of the additional information requested in the preliminary approval letter, and will provide conclusions and findings in the Energy Commission’s hearings. The Cal-ISO final interconnection approval will assure conformance with NERC, WSCC and Cal-ISO reliability criteria.

Alternative Transmission Line Routes

Due to the use of existing on-site facilities, CEC staff concludes no alternatives would be feasible at the site that would vary significantly from the applicant’s proposed transmission interconnection (ESPR 2000a).

CUMULATIVE IMPACTS

Due to the large number of potential new generators in the SCE area there would be cumulative impacts associated with the interconnection and operation of the EI Segundo Project. The System Impact Study and the Facility Study both indicate that there are facility overloads caused by other proposed generators that would be exacerbated by the EI Segundo Project. However, whether or not these other generators will ever be permitted and operated is very uncertain.

Since the System Impact Study was completed for the EI Segundo Project in December 18, 2000, there have been significant changes in the generators proposed in the SCE

area. The Cal-ISO has recommended that the Facility Study, completed September 12, 2001, be updated because significant projects that were in the SCE new generator queue ahead of the El Segundo Project have since dropped out of the queue and are no longer expected to be built. Thus, while there could be cumulative transmission impacts caused by the combined operation of the El Segundo Project and other proposed projects, these potential impacts are highly speculative because of the uncertainty surrounding the other generators. Impacts caused by the El Segundo project will be mitigated as previously discussed.

FACILITY CLOSURE

PLANNED CLOSURE

This type of closure occurs in a planned and orderly manner such as at the end of its useful economic or mechanical life or due to gradual obsolescence. Under such circumstances, the owner is required to provide a closure plan 12 months prior to closure, which in conjunction with applicable LORS, is considered sufficient to provide adequately for safety and reliability. For instance, a planned closure provides time for the owner to coordinate with the Participating Transmission Owner (PTO), in this case SCE, to assure (as one example) that the PTO's system will not be closed into the outlet thus energizing the project substation. Alternatively, the owner may coordinate with the PTO to maintain some power service via the outlet line to supply critical station service equipment or other loads. The facility closure plan will address all such TSE issues.

UNEXPECTED TEMPORARY CLOSURE

An unplanned closure occurs when the facility is closed suddenly and/or unexpectedly for a short term due to unforeseen circumstances such as a natural or other disaster or emergency. During such a closure the facility cannot insert power into the utility system. Closures of this sort can be accommodated by establishing an on-site contingency plan (see **General Conditions Including Compliance Monitoring and Closure Plan**).

UNEXPECTED PERMANENT CLOSURE

This unplanned closure occurs when the project owner abandons the facility. This is considered to be a permanent closure. This includes unexpected closure where the owner remains accountable for implementing the on-site contingency plan. It can also include unexpected closure where the project owner is unable to implement the contingency plan, and the project is essentially abandoned. An on-site contingency plan will be developed to assure safety and reliability, and must be in place and approved by the Energy Commission's Compliance Project Manager (CPM) prior to the beginning of commercial operation of the facilities (see **General Conditions Including Compliance Monitoring and Closure Plan**).

CONCLUSIONS AND RECOMMENDATIONS

Staff concludes that no significant additional new transmission facilities, other than those proposed by the applicant, are required for the interconnection of the El Segundo Project to meet NERC, WSCC, and Cal-ISO reliability criteria.

The Cal-ISO has provided preliminary approval of the interconnection.

The power plant switchyard, outlet lines, and termination are acceptable and will comply with LORS assuming the proposed conditions of certification are implemented.

The issuance of the Cal-ISO's final interconnection approval will assure conformance with NERC, WSCC and Cal-ISO reliability criteria. Conditions of Certification TSE-5e and TSE-5f provide for Energy Commission review of the Cal-ISO's final interconnection approval letter and the SCE/applicant Generator Special Facilities Agreement.

Staff proposes the following conditions of certification to ensure system reliability and conformance with LORS.

CONDITIONS OF CERTIFICATION

Some of the Conditions of Certification in this section have been changed from the Preliminary Staff Assessment based on staff's efforts to standardize Conditions of Certification to the extent feasible based on recent experience in the certification and compliance process. These changes do not affect the substance of the requirements in the Condition. Other Conditions have been changed based on stipulated agreements between staff and the applicant. All of the modified Conditions are supported by the analysis outlined in the text above.

TSE-1 The project owner shall furnish to the CPM and to the CBO a schedule of transmission facility design submittals, a Master Drawing List, a Master Specifications List, and a Major Equipment and Structure List. The schedule shall contain a description and list of proposed submittal packages for design, calculations, and specifications for major structures and equipment. To facilitate audits by Energy Commission staff, the project owner shall provide designated packages to the CPM when requested.

Verification: At least 60 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of construction, the project owner shall submit the schedule, a Master Drawing List, and a Master Specifications List to the CBO and to the CPM. The schedule shall contain a description and list of proposed submittal packages for design, calculations, and specifications for major structures and equipment (see a list of major equipment in **Table 1: Major Equipment List** below). Additions and deletions shall be made to the table only with CPM and CBO approval. The project owner shall provide schedule updates in the Monthly Compliance Report.

Table 1: Major Equipment List
Breakers
Step-up Transformer
Switchyard
Busses
Surge Arrestors
Disconnects
Take off facilities
Electrical Control Building
Switchyard Control Building
Transmission Pole/Tower
Grounding System

TSE-2 Prior to the start of construction the project owner shall assign an electrical engineer and at least one of each of the following to the project: A) a civil engineer; B) a geotechnical engineer or a civil engineer experienced and knowledgeable in the practice of soils engineering; C) a design engineer, who is either a structural engineer or a civil engineer fully competent and proficient in the design of power plant structures and equipment supports; or D) a mechanical engineer. (Business and Professions Code Sections 6704 et seq., require state registration to practice as a civil engineer or structural engineer in California.)

The tasks performed by the civil, mechanical, electrical or design engineers may be divided between two or more engineers, as long as each engineer is responsible for a particular segment of the project (e.g., proposed earthwork, civil structures, power plant structures, equipment support). No segment of the project shall have more than one responsible engineer. The transmission line may be the responsibility of a separate California registered electrical engineer. The civil, geotechnical or civil and design engineer assigned in conformance with Facility Design condition **GEN-5**, may be responsible for design and review of the TSE facilities.

The project owner shall submit to the CBO for review and approval, the names, qualifications and registration numbers of all engineers assigned to the project. If any one of the designated engineers is subsequently reassigned or replaced, the project owner shall submit the name, qualifications and registration number of the newly assigned engineer to the CBO for review and approval. The project owner shall notify the CPM of the CBO's approval of the new engineer. This engineer shall be authorized to halt earthwork and to require changes; if site conditions are unsafe or do not conform with predicted conditions used as a basis for design of earthwork or foundations.

The electrical engineer shall:

1. Be responsible for the electrical design of the power plant switchyard, outlet and termination facilities; and
2. Sign and stamp electrical design drawings, plans, specifications, and calculations.

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

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

TSE-3 If any discrepancy in design and/or construction is discovered in any engineering work that has undergone CBO design review and approval, the project owner shall document the discrepancy and recommend corrective action. (1998 CBC, Chapter 1, Section 108.4, Approval Required; Chapter 17, Section 1701.3, Duties and Responsibilities of the Special Inspector; Appendix Chapter 33, Section 3317.7, Notification of Noncompliance]. The discrepancy documentation shall become a controlled document and shall be submitted to the CBO for review and approval and shall reference this condition of certification.

Verification: The project owner shall submit a copy of the CBO's approval or disapproval of any corrective action taken to resolve a discrepancy to the CPM within 15 days of receipt. If disapproved, the project owner shall advise the CPM, within five days, the reason for disapproval, and the revised corrective action required to obtain the CBO's approval.

TSE-4 For the power plant switchyard, outlet line and termination, the project owner shall not begin any increment of construction until plans for that increment have been approved by the CBO. These plans, together with design changes and design change notices, shall remain on the site for one year after completion of construction. The project owner shall request that the CBO inspect the installation to ensure compliance with the requirements of applicable LORS. The following activities shall be reported in the Monthly Compliance Report:

- a) receipt or delay of major electrical equipment;
- b) testing or energization of major electrical equipment; and
- c) the number of electrical drawings approved, submitted for approval, and still to be submitted.

Verification: At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of each increment of construction, the project owner shall submit to the CBO for review and approval the final design plans, specifications and calculations for equipment and systems of the power plant switchyard, outlet line and termination, including a copy of the signed and stamped statement from the responsible electrical engineer attesting to compliance with the applicable LORS, and send the CPM a copy of the transmittal letter in the next Monthly Compliance Report.

TSE-5 The project owner shall ensure that the design, construction and operation of the proposed transmission facilities will conform to all applicable LORS, including

the requirements listed below. The substitution of CPM and CBO approved “equivalent” equipment and equivalent substation configurations is acceptable. The project owner shall submit the required number of copies of the design drawings and calculations as determined by the CBO.

- a) The power plant switchyard and outlet line shall meet or exceed the electrical, mechanical, civil and structural requirements of CPUC General Order 95 or National Electric Safety Code (NESC), Title 8 of the California Code and Regulations (Title 8), Articles 35, 36 and 37 of the “High Voltage Electric Safety Orders”, National Electric Code (NEC) and related industry standards.
- b) Breakers and busses in the power plant switchyard and other switchyards, where applicable, shall be sized to comply with a short-circuit analysis.
- c) Outlet line crossings and line parallels with transmission and distribution facilities shall be coordinated with the transmission line owner and comply with the owner’s standards.
- d) The project conductors shall be sized to accommodate the full output from the project.
- e) Termination facilities shall comply with applicable SGD&E interconnection standards.
- f) The project owner shall provide:
 - i) The final Detailed Facility Study (DFS) including a description of facility upgrades, operational mitigation measures, and/or Special Protection System (SPS) sequencing and timing if applicable,
 - ii) Executed Facility Interconnection Agreement
 - iii) Verification of Cal-ISO Notice of Synchronization.

Verification: At least 60 days prior to the start of construction of transmission facilities (or a lesser number of days mutually agree to by the project owner and CBO, the project owner shall submit to the CBO for approval:

- a) Design drawings, specifications and calculations conforming with CPUC General Order 95 or NESC, Title 8, Articles 35, 36 and 37 of the “High Voltage Electric Safety Orders”, NEC, applicable interconnection standards and related industry standards, for the poles/towers, foundations, anchor bolts, conductors, grounding systems and major switchyard equipment.
- b) For each element of the transmission facilities identified above, the submittal package to the CBO shall contain the design criteria, a discussion of the calculation method(s), a sample calculation based on “worst case conditions”² and a statement signed and sealed by the registered engineer in responsible charge, or other acceptable alternative verification, that the transmission element(s) will conform with CPUC General Order 95 or NESC, Title 8, California Code of Regulations, Articles 35, 36 and 37 of the, “High Voltage

² Worst case conditions for the foundations would include for instance, a dead-end or angle pole.

Electric Safety Orders”, NEC, applicable interconnection standards, and related industry standards.

- c) Electrical one-line diagrams signed and sealed by the registered professional electrical engineer in responsible charge, a route map, and an engineering description of equipment and the configurations covered by requirements **TSE-5** a) through f) above.
- d) The DFS operational mitigation measures, SPS, and executed Facility Interconnection Agreement shall be provided concurrently to the CPM and CBO. Substitution of equipment and substation configurations shall be identified and justified by the project owner for CBO approval.

TSE-6 The project owner shall inform the CPM and CBO of any impending changes, which may not conform to the requirements **TSE-5** a) through f), and have not received CPM and CBO approval, and request approval to implement such changes. A detailed description of the proposed change and complete engineering, environmental, and economic rationale for the change shall accompany the request. Construction involving changed equipment or substation configurations shall not begin without prior written approval of the changes by the CBO and the CPM.

Verification: At least 60 days prior to the construction of transmission facilities, the project owner shall inform the CBO and the CPM of any impending changes which may not conform to requirements of **TSE-5** and request approval to implement such changes.

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

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

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

TSE-8 The project owner shall be responsible for the inspection of the transmission facilities during and after project construction, and any subsequent CPM and CBO approved changes thereto, to ensure conformance with CPUC GO-95 or NESC, Title 8, CCR, Articles 35, 36 and 37 of the, “High Voltage Electric Safety Orders”, applicable interconnection standards, NEC and related industry standards. In case of non-conformance, the project owner shall inform the CPM

and CBO in writing, within 10 days of discovering such non-conformance and describe the corrective actions to be taken.

Verification: Within 60 days after first synchronization of the project, the project owner shall transmit to the CPM and CBO:

- a) “As built” engineering description(s) and one-line drawings of the electrical portion of the facilities signed and sealed by the registered electrical engineer in responsible charge. A statement attesting to conformance with CPUC GO-95 or NESC, Title 8, California Code of Regulations, Articles 35, 36 and 37 of the, “High Voltage Electric Safety Orders”, and applicable interconnection standards, NEC, related industry standards, and these conditions shall be provided concurrently.
- b) An “as built” engineering description of the mechanical, structural, and civil portion of the transmission facilities signed and sealed by the registered engineer in responsible charge or acceptable alternative verification. “As built” drawings of the mechanical, structural, and civil portion of the transmission facilities shall be maintained at the power plant and made available, if requested, for CPM audit as set forth in the “Compliance Monitoring Plan”.
- c) A summary of inspections of the completed transmission facilities, and identification of any nonconforming work and corrective actions taken, signed and sealed by the registered engineer in charge.

REFERENCES

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

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

Cal-ISO (California Independent System Operator) 2001. California ISO’s comments regarding the System Impact Studies and Detailed Facilities Study Report. Letter from Jeff Miller, dated April 4, 2001. Revised May 10, 2001.

ESPR (El Segundo Power Station) 2000a – Application for Certification Submitted to the California Energy Commission on December 18, 2000.

ESPR (El Segundo Power Station) 2000h – Supplement information areas: Project Description, Biological Resources, Water Resources, Traffic and Transportation, Visual Resources, Transmission System Engineering, Socioeconomic and Worker Safety Submitted to California Energy Commission on January 18, 2001.

ESPR (El Segundo Power Station) – 2000i – System Interconnect Study submitted to the California Energy Commission on February 8, 2001.

ESPR (El Segundo Power Station) – 2001 – Record of Telephone conversation between CEC staff and the legal counsel for the applicant, John McKinsey. The

applicant reports that RAS is planned to avoid overloads over upgrades of the overhead/underground or other transmission lines, and in the event that RAS developed for the full plant output will not meet required criteria for transmission system reliability, the project is committed to modification of the generation project design to make RAS work and thereby avoid physical upgrades to transmission lines. April 26, 2001.

ESPR (El Segundo Power Station) – 2002x – Facilities Study submitted to the California Energy Commission on May 21, 2002.

ESPR (El Segundo Power Station) – 2002gg – Letter choosing Alternative 3 described in the Facilities Study, submitted to the California Energy Commission on July 30, 2002.

NERC (North American Electric Reliability Council). 1998. NERC Planning Standards, September 1997.

WSCC (Western Systems Coordinating Council) 1997. Reliability Criteria, August 1998.

DEFINITION OF TERMS

AAC All Aluminum conductor.

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

Ampere The unit of current flowing in a conductor.

Bundled Two wires, 18 inches apart.

Bus Conductors that serve as a common connection for two or more circuits.

Conductor The part of the transmission line (the wire) which carries the current.

Congestion Management

Congestion management is a scheduling protocol, which provides that dispatched generation and transmission loading (imports), will not violate criteria.

Emergency Overload

See Single Contingency. This is also called an L-1.

Kcmil or kcm

Thousand circular mil. A unit of the conductor's cross sectional area, when divided by 1,273, the area in square inches is obtained.

Kilovolt (kV)

A unit of potential difference, or voltage, between two conductors of a circuit, or between a conductor and the ground.

Loop An electrical cul de sac. A transmission configuration which interrupts an existing circuit, diverts it to another connection and returns it back to the interrupted circuit, thus forming a loop or cul de sac.

Megavar One megavolt ampere reactive.

Megavars Mega-volt-Ampere-Reactive. One million Volt-Ampere-Reactive.

Reactive power is generally associated with the reactive nature of motor loads that must be fed by generation units in the system.

Megavolt ampere (MVA)

A unit of apparent power, equals the product of the line voltage in kilovolts, current in amperes, the square root of 3, and divided by 1000.

Megawatt (MW)

A unit of power equivalent to 1,341 horsepower.

Multiple Contingencies

A condition that occurs when more than one major transmission element (circuit, transformer, circuit breaker, etc.) or more than one generator is out of service

Normal Operation/ Normal Overload

When all customers receive the power they are entitled to without interruption and at steady voltage, and no element of the transmission system is loaded beyond its continuous rating.

N-1 Condition

See Single Contingency.

Outlet Transmission facilities (circuit, transformer, circuit breaker, etc.) linking generation facilities to the main grid.

Power Flow Analysis/FS

A power flow analysis/FS is a forward looking computer simulation of essentially all generation and transmission system facilities that identifies overloaded circuits, transformers and other equipment and system voltage levels.

Reactive Power

Reactive power is generally associated with the reactive nature of motor loads that must be fed by generation units in the system. An adequate supply of reactive power is required to maintain voltage levels in the system.

Remedial Action Scheme (RAS)

A remedial action scheme is an automatic control provision, which, for instance, will trip a selected generating unit upon a circuit overload.

SF6 Sulfur hexafluoride is an insulating medium.

Single Contingency

Also known as emergency or N-1 condition, occurs when one major transmission element (circuit, transformer, circuit breaker, etc.) or one generator is out of service.

Solid dielectric cable

Copper or aluminum conductors that are insulated by solid polyethylene type insulation and covered by a metallic shield and outer polyethylene jacket.

Switchyard A power plant switchyard (switchyard) is an integral part of a power plant and is used as an outlet for one or more electric generators.

Thermal rating

See ampacity.

TSE Transmission System Engineering.

Undercrossing

A transmission configuration where a transmission line crosses below the conductors of another transmission line, generally at 90 degrees.

Underbuild

A transmission or distribution configuration where a transmission or distribution circuit is attached to a transmission tower or pole below (under) the principle transmission line conductors.

ALTERNATIVES

Testimony of James W. Reede, Jr., MPPA

INTRODUCTION

This section considers potential alternatives to the construction and operation of the proposed El Segundo Power Redevelopment (ESPR) project. The purpose of this alternatives analysis is to comply with California's environmental laws by providing an analysis of a reasonable range of feasible alternatives that could substantially reduce or avoid any potentially significant adverse impacts of the proposed project (Cal. Code Regs., tit. 14, §15126.6; Cal. Code Regs., tit. 20, §1765). This section identifies potentially significant impacts of the proposed project and analyzes different technologies and alternative sites that may reduce or avoid significant impacts. Staff also analyzes the impacts that may be created by locating the project at alternative sites.

The "Guidelines for Implementation of the California Environmental Quality Act," Title 14, California Code of Regulations Section 15126.6(a), provide direction by requiring an evaluation of the comparative merits of "a range of reasonable alternatives to the project, or to the location of the project, which would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects of the project." In addition, the analysis must address the No Project Alternative (Cal. Code Regs., tit. 14, §15126.6(e)).

The range of alternatives is governed by the "rule of reason" which requires consideration only of those alternatives necessary to permit informed decision-making and public participation. The California Environmental Quality Act (CEQA) states that an environmental document does not have to consider an alternative if its effect cannot be reasonably ascertained and if its implementation is remote and speculative (Cal. Code Regs., tit. 14, §15125(d)(5)). However, if the range of alternatives is defined too narrowly, the analysis may be inadequate (*City of Santee v. County of San Diego* (4th Dist. 1989) 214 Cal. App. 3d 1438).

The Warren-Alquist Act specifies that a party filing an Application for Certification of a natural gas fired power plant "modification" (such as the ESPR project) is not required to provide any information *in its application* on alternative *sites* for the proposed facility (Pub. Resources Code § 25540.6(a) and (b)). However, the Energy Commission's Siting Regulations (Cal. Code Regs., tit. 20, § 1765) require that:

"At the hearings . . . on an application exempt from the [Notice Of Intent] requirements pursuant to Public Resources Code section 25540.6, the parties shall present information on 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."

In light of these provisions, staff presents information in this section on the "feasibility of available site and facility alternatives to the applicant's proposal that substantially lessen the significant adverse impacts of the proposal on the environment" (Cal. Code Regs.,

tit. 20, §1765). Staff also analyzes whether there are any feasible alternative designs or alternative technologies, including the “no project alternative,” that may be capable of reducing or avoiding any potential impacts of the proposed project while achieving its major objectives.

Staff has also conducted a separate analysis of the feasibility and potential impacts of using reclaimed water (rather than seawater) for the once-through cooling system to cool the steam turbine. This analysis is presented as Appendix A to the **BIOLOGICAL RESOURCES** section of this FSA, and is not discussed in this section.

SCOPE AND METHOD FOR THIS ALTERNATIVES ANALYSIS

The CEQA Guidelines provide direction regarding the proper scope of an “alternatives” analysis by requiring 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 but would avoid or substantially lessen any of the significant effects of the project” (Cal. Code Regs., tit. 14, §15126.6(a)). In addition, the analysis must address the “no project” alternative (Cal. Code Regs., tit. 14, §15126.6(e)).

The range of alternatives is governed by the “rule of reason” which requires consideration only of those alternatives necessary to permit informed decision-making and public participation. The CEQA Guidelines specifically state that “Alternatives shall be limited to ones that would avoid or substantially lessen any of the significant effects of the project. Of those alternatives, the [review] need examine in detail only the ones that the lead agency determines could feasibly attain most of the basic objectives of the project” (Cal. Code Regs., tit. 14., § 15126.6(f)).

To prepare this alternatives analysis, staff used the methodology summarized below:

- Identify the basic objectives and potential significant impacts of the project.
- Determine whether there are any feasible *site alternatives* for analysis by evaluating the extent to which most of the project objectives can be achieved at alternative sites and the degree to which any significant impacts of the project would be substantially lessened at such alternative sites.
- Identify and evaluate facility design and related facilities alternatives to the project as proposed.
- Identify and evaluate technical alternatives to the project. The principle project alternatives examined that do not require the construction of a natural gas-fired facility are increased energy efficiency (or demand side management) and the construction of alternative technologies (e.g. wind, solar, or geothermal).

Staff’s alternatives analysis begins by identifying the basic objectives of the project, describing the project and project setting, and listing potential significant impacts from the project as currently proposed. The analysis then turns to a consideration of various alternatives to the proposed ESPR project. These alternatives were developed in response to information received from the Energy Commission’s staff and from other agencies.

BASIC OBJECTIVES OF THE PROJECT

After studying the applicant's Application for Certification (AFC), staff has determined that the project's major objectives are to:

- produce cost-effective electricity to compete in California's deregulated electricity markets;
- make use of existing local infrastructure to the extent feasible;
- improve the overall environmental performance and reliability of the electrical generating sector in Southern California;
- produce electricity with minimal environmental impacts;
- alleviate the consequences of today's capacity shortage in Southern California; and
- assist in meeting the projected energy demand growth in Los Angeles County.

PROJECT DESCRIPTION AND SETTING

A more complete description of the project and its setting is presented in the **Project Description** section of this document.

PROJECT SITE

The applicant proposes to modify an existing power plant in El Segundo, California, an incorporated city in Los Angeles County. The site consists of 3 contiguous parcels approximately 34 acres in size. The site is bordered by Vista Del Mar Boulevard and the Chevron Refinery on the east, Santa Monica Bay on the west, 45th Street of the City of Manhattan Beach on the south and the Chevron Marine terminal on the north. The facility is located at Township 3 South, Range 15 West, of the Venice USGS Quadrangle Map. See **PROJECT DESCRIPTION Figure 1**.

POWER PLANT

The new combined cycle facility is expected to provide a net output of 630 megawatts (MW) under nominal conditions. This is 280 MW more than the old Units 1 and 2 were capable of generating when operating. The project includes demolition and removal of the existing Units 1 and 2 and their replacement with Units 5, 6, and 7 in the footprint of Units 1 and 2. The applicant proposes to use the existing steam cycle heat rejection system, which utilizes cooling water from Santa Monica Bay, for the new equipment. The existing ESGS Units 3 and 4 located adjacent to Units 1 and 2 will not be modified by this project.

Units 5 and 7 will be General Electric PG7241FA combustion turbine generators. These natural gas fired generators will each have a base load gross output of 171.7 MW. The gross output will be increased to 183.4 MW for peak loads by using steam injection. The combined cycle configuration will be accomplished with the addition a Heat Recovery Steam Generator (HRSG) to the exhaust outlets of both Units 5 and 7. The addition of a General Electric Steam Turbine Generator (STG) will complete the combined cycle configuration. The STG will have a peak generating output of 280 MW.

The project will use Selective Catalytic Reduction (SCR), a dry, low NO_x combustor and an oxidation catalyst system to reduce air emissions. Aqueous ammonia for SCR will be supplied from the Chevron Refinery through a pipeline under Vista Del Mar, via an existing underpass. The aqueous ammonia will be stored in an existing 20,000-gallon underground storage tank.

An aerial view of the plant layout is provided in **PROJECT DESCRIPTION Figure 2** and shows the existing power plant site and electrical substation. **PROJECT DESCRIPTION Figure 3** provides a view of how the plant will look on the site. **PROJECT DESCRIPTION Figure 4** shows elevations of the power plant facilities.

RELATED FACILITIES

Transmission System Interconnection

The project site is located adjacent to an existing SCE-owned 230 kilovolt (kV) switchyard. ESPR plans to connect directly to this switchyard through new connections. Three new generator step-up transformers will be installed and connected to the existing 230 kV switchyard. The connections to the switchyards will be made via aboveground lead lines and new steel support poles. No new transmission lines or transmission line upgrades are planned as part of this project (ESPR 2000a, p. 1-6).

Natural Gas Supply Pipeline

The existing natural gas supply pipeline owned by Southern California Gas has sufficient capacity to supply the needs of the proposed plant site.

Raw Water Supply

Water requirements for the project are estimated at 207 million gallons per day at full operation and will be supplied from a combination of sources. The applicant proposes to use the existing seawater cooling system for the new units without modifying the intake or outfall structures and lines.

The City of El Segundo, through purchases from the Metropolitan Water District, will supply potable water. The plant will be using approximately 180,000 gallons per day.

The West Basin Municipal Water District will supply approximately 86,000 gallons of reclaimed water per day for both irrigation and for pumps and bearings seal water augmentation.

Wastewater Disposal

Wastewater discharge falls into two categories, process and sanitary. Processed wastewater will be routed through the existing circulating water system ocean outfall and the sanitary wastewater discharges will be directed to the City of Manhattan Beach Municipal Sanitary Sewer System.

POTENTIAL SIGNIFICANT ENVIRONMENTAL IMPACTS

In the Issues Identification Report (IIR) and the June 2001 Staff Assessment (SA), staff identified potential significant environmental effects of the proposed project on air

quality, biological resources, visual resources, and water resources (CEC 2000a). Since that time, additional information has caused staff to revise its assessment of some potential impacts. Staff's current assessment of the expected environmental consequences of the proposed project is summarized below for technical areas where issues have been identified. Staff's assessment is presented in more detail in the individual sections of this document.

AIR QUALITY

Staff initially identified air quality issues relating to emission reduction credits (ERCs) and Best Available Control Technology (BACT) that could have resulted in significant impacts or affected the project schedule. When staff filed the IIR and SA, a portion of the necessary ERCs for the El Segundo Power Plant remained inadequately identified.

Staff has concluded that ESPR's potential for direct, cumulative, and secondary impacts on SO₂ and on particulate (PM₁₀) ambient air quality conditions have not been mitigated to a level of insignificance. The district has submitted a final determination of compliance that concludes that the ESPR will comply with all applicable district rules and regulations and therefore has recommended a set of conditions for certification. Finally, staff recommends that the approval of certification be withheld until the applicant provides further mitigation for PM₁₀ and SO_x emission impacts.

BIOLOGICAL RESOURCES

Staff has concluded that the project will cause unmitigated adverse biological impacts. Staff's analysis finds that the entrainment, impingement and thermal effects on fish and invertebrates from the project's once-through cooling system will cause unmitigated direct adverse impacts to marine organisms that may be significant and cumulative impacts that are significant. Because the applicant has provided unreliable recent scientific information concerning the extent of adverse entrainment impacts on fish larvae and other plankton species, staff cannot determine the scope and magnitude of the project's *direct* impacts at this time. However, the waters of Santa Monica Bay and the Southern California Bight are already experiencing serious degradation in a number of marine organisms, and the unmitigated entrainment, impingement and thermal impacts of the proposed project will cause significant *cumulative* adverse biological impacts to marine organisms. Other potential adverse impacts of the project to marine and terrestrial organisms have been analyzed and determined to be insignificant. More information on these issues is provided in the **BIOLOGICAL RESOURCES** section of this document. That section also includes an appendix analyzing the potential for using reclaimed water rather than sea water for the project's once-through cooling system.

CULTURAL RESOURCES

Since project development and construction usually entail surface and sub-surface disturbance of the ground, the proposed ESPR project has the potential to adversely affect both known and unknown cultural resources. ESPR has proposed mitigation measures to avoid significant impact to cultural resources. Staff concurs with the mitigation measures proposed by the applicant in the AFC and associated filings. Staff has adapted the applicant's proposed mitigation measures into a series of Conditions of Certification, sometimes rewording for clarification and adding time frames and other requirements. Adoption of staff's proposed Conditions of Certification is expected to

reduce the potential for adverse project impacts on cultural resources to a less than significant level.

LAND USE

Staff has found that the proposed project is consistent with the applicable LORS in the Cities of El Segundo, Manhattan Beach, and Los Angeles. The Energy Commission has received a partial Coastal Commission consistency and suitability report with a determination that biology and visual issues are inconsistent with the Coastal Act. The Coastal Commission has not made findings related to the balance of project-related issues, including the project's land use consistency. Therefore, staff can not make a final conclusion that the project is consistent with the California Coastal Act from a land use perspective at this time. The Federal Aviation Administration and the California Department of Transportation, Aviation Division have determined that the location of the stacks at the project site does not pose a hazard to navigation at the Los Angeles International Airport.

NOISE

During the course of the staff workshops concerns and questions were raised regarding the potential impacts of noise generated by the project. In response, the applicant expressed a willingness to perform a 30-day ambient noise level monitoring survey at the project site. Based on the requests of the cities of El Segundo and Manhattan Beach, staff sent the applicant the proposed Condition of Certification relating to the pre-construction ambient noise monitoring so the survey could be completed in July and August 2002. The applicant has chosen not to perform the survey until summer 2003. Staff believes that if the ESPR facility is designed as described in this report and follows the proposed Conditions of Certification, it is not likely to produce significant adverse noise impacts.

TRAFFIC AND TRANSPORTATION

The construction phase will cause increased roadway demand resulting from the daily movement of workers and materials. This will result in traffic increases causing the Level of Service (LOS) for various roadways to increase beyond LOS thresholds established by local and regional authorities. During the construction phase, increased commuter traffic caused by the workforce could also result in some traffic congestion. ESPR has proposed ways to reduce traffic impacts. During the operational phase, increased roadway demand resulting from the daily movement of workers and materials will be minimal. The water supply line construction will require trenching within public road rights-of-way; the installation of underground facilities will impact both roadway function and levels of service. Although all of these impacts are expected to be short-term they have the potential to be significant. In the AFC, ESPR proposed to provide appropriate traffic control mitigation measures to avoid significant impacts from this construction activity. Based on staff's analysis, if the proposed mitigation measures are properly implemented, no significant traffic impacts are likely to occur.

VISUAL

Because potential project impacts of the ESPR have been evaluated against the baseline of strong existing visual impacts of the ESGS, few significant impacts were

identified under CEQA. However, staff does not regard either the existing ESGS or unmitigated ESPR as visually compatible with their scenic coastal setting as viewed from high sensitivity foreground viewpoints on Vista del Mar and Dockweiler and Manhattan State Beaches. One visual resource issue is still outstanding. In March 2002, the Coastal Commission made a finding that the plant site is visually degraded, and that the project is inconsistent with the Coastal Act. The Coastal Commission also recommended specific provisions needed to make the project consistent with the Coastal Act. Subsequently, in June 2002, the Applicant submitted a revised Visual Enhancement Proposal. A more detailed analysis of these impacts and their potential mitigation is discussed in the staff assessment **VISUAL RESOURCES** section.

ALTERNATIVES TO THE PROJECT

As discussed above, the Energy Commission siting regulations require the parties in a siting case exempt from the Notice of Intention proceedings to present “information on 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).

SITE ALTERNATIVES

Consistent with the CEQA Guidelines, the scope of staff’s consideration of alternative sites was guided by consideration of whether most project objectives could be accomplished at alternative sites, and whether locating the project at an alternative site would substantially lessen any identified significant impacts of the project (Cal. Code Regs., tit. 14 §15126.6(a)). As discussed below, staff has determined that locating the project at an alternative site would not achieve one of the major objectives of the project, since it would no longer be possible to make use of the existing infrastructure at the ESGS site. While an alternative site would reduce or eliminate the project’s impacts to coastal resources, staff believes that alternative means to reduce or avoid those impacts are available that would allow the project to make use of the existing infrastructure at the ESGS site. Under these circumstances, staff has applied the “rule of reason” and decided that it need not perform a detailed analysis of alternative *sites*.

Meeting Major Objectives of the Project

ESPR’s basic objectives are to provide economically competitive electricity in Southern California while minimizing impacts and costs by making use of an existing power plant site and related infrastructure to the extent feasible. The project as proposed in the AFC would make use of much of the infrastructure of the existing site, including the existing water supply, former oil storage tanks, natural gas supply line, and access to the adjacent SCE switchyard to connect to the transmission grid. The project will include the addition of two new combined cycle power plant units, the construction of a pipeline to supply aqueous ammonia, a new pipeline to supply both potable and reclaimed water, and a new wastewater pipeline connection. As such, the project is a “modification” that will make substantial use of the existing site and infrastructure, but will also require key new infrastructure.

Based on this analysis, staff has determined that the proposed project makes substantial use of the existing infrastructure. A “stand-alone” combined cycle power

plant at an alternative site that makes no use of the infrastructure at the existing site is possible. However, this alternative would not achieve one of the major objectives of this project, namely the use of the existing on-site infrastructure to the extent feasible.

Reducing Significant Environmental Impacts

Staff's review of the proposed project has identified some potentially significant impacts. Staff's analysis of these impacts is discussed below.

Air Quality

Staff identified two air quality issues in the IIR and SA. At the time the AFC was accepted, ESPR had not adequately identified the ERCs needed for the project, and staff was not satisfied that EPA would find ESPR's BACT analysis sufficient. Since then, staff has concluded that the proposed project's potential for direct, cumulative, and secondary impacts on SO_x and on PM₁₀ ambient air quality conditions has not been mitigated to a level of insignificance. Until the applicant provides further mitigation measures, staff cannot recommend the approval of the project. Similar air quality concerns would arise at alternative sites in the general Los Angeles area.

Biological Resources

Staff has determined that the project will cause unmitigated adverse biological impacts. Staff's analysis finds that the entrainment, impingement and thermal effects on fish and invertebrates from the project's once-through cooling system will cause unmitigated direct adverse impacts to marine organisms that may be significant and cumulative impacts that are significant. Staff is currently recommending that the Energy Commission license the project only with mitigation that avoids or significantly reduces the adverse biological impacts from the use of water from Santa Monica Bay for once-through cooling. Because of the lack of the sound scientific information on entrainment impacts that would be needed to develop appropriate mitigation, staff cannot recommend approval of the project as proposed at this time. Until a scientifically valid study of ESGS impingement and entrainment effects is completed, staff cannot recommend specific mitigation measures for this project, other than to abandon the use of water from Santa Monica Bay for once-through cooling altogether, that would reduce the impacts to less than significant levels.

Staff has separately analyzed the use of reclaimed water rather than sea water for cooling, which provides a project alternative that could effectively avoid these impacts without moving the project to a new site (see Appendix A of the **BIOLOGICAL RESOURCES** section). The project's marine impacts could also be avoided by locating the power plant at an inland site (using fresh water, if available, in wet or hybrid cooling towers, reclaimed water if available, or using dry cooling). However, an objective of this project is to serve the Los Angeles area, and because of the density of existing development, appropriate inland sites are very difficult to find. In urban areas, use of these sites can create significant visual and noise impacts, as well as potential disproportionate impacts to minority and low-income populations. In more rural areas, there is the potential for significant impacts to terrestrial biological resources. Therefore, given the objectives of the proposed ESPR project, staff believes that the consideration of another site, while offering one method to eliminate the marine biological impacts, would likely create additional significant impacts in other disciplines.

Cultural Resources

Since power plant development and construction usually entail surface and sub-surface disturbance of the ground, the proposed ESPR project at this location or another location has the potential to adversely affect both known and unknown cultural resources. Staff has determined that appropriate implementation of the mitigation measures proposed by ESPR will avoid significant impact to cultural resources.

Traffic and Transportation

The construction phase will cause increased roadway demand resulting from the daily movement of workers and materials. These impacts would be similar at other locations. This will result in traffic increases causing the LOS for various roadways to increase beyond LOS thresholds established by local and regional authorities. The water supply line construction will require trenching within public road rights-of-way. The installation of underground facilities will impact both roadway function and levels of service. The construction of the berm, depending on height and time of implementation, has the potential to cause significant impacts to truck traffic in the area. Although all of these impacts are expected to be short-term they have the potential to be significant. In the AFC, ESPR proposed to provide appropriate traffic control mitigation measures to avoid significant impacts from this construction activity. Based on staff's analysis, if the proposed mitigation measures are properly implemented, no significant traffic impacts are likely to occur, at this site or at other sites.

Visual

Because potential project impacts of the ESPR have been evaluated against the baseline of strong existing visual impacts of the ESGS, few significant impacts were identified under CEQA. However, staff does not regard either the existing ESGS or unmitigated ESPR as visually compatible with their scenic coastal setting as viewed from high sensitivity foreground viewpoints on Vista del Mar and Dockweiler and Manhattan State Beaches. One visual resource issue is still outstanding. In March 2002, the Coastal Commission made a finding that the plant site is visually degraded, and that the project is inconsistent with the Coastal Act. The Coastal Commission also recommended specific provisions needed to make the project consistent with the Coastal Act. Subsequently, in June 2002, the Applicant submitted a revised Visual Enhancement Proposal. A more detailed analysis of the degree to which ESPR's proposed mitigation will reduce these impacts is discussed in detail in the **VISUAL RESOURCES** staff analysis section. Because the proposed power plant is trying to serve the Los Angeles area, an alternative site may be less scenic than the coast, but it would still be located in a populated area and have major visual impacts. In addition, if the project were moved to an alternative site, the existing ESGS facility would remain in place without any visual enhancement as currently proposed for this project. The result would be that the site would remain visually degraded.

Water Resources

The project as proposed in the AFC does not impose potentially significant impacts on water supply through the use of large volumes of Santa Monica Bay water for once-through cooling, but use of this water does have the potential to cause significant impacts to marine biological resources, as discussed above. The most feasible means

of substantially reducing these impacts would be by identifying alternative water supplies or by reducing the project's use of water. Developing the project at an alternative site would require identification and use of different cooling technologies (i.e. dry or hybrid cooling or alternative water supplies). Because the staff has evaluated once-through cooling using reclaimed water (see Appendix A to the **BIOLOGICAL RESOURCES** section), the water resources impacts of the original proposal do not require analysis of alternative sites.

Site Alternatives Conclusion

Staff's analysis of alternative sites, presented above, is based on a review of the major objectives of the project, and the impacts identified in this document. Staff first considered whether the project's objectives could be accomplished at alternative sites. Staff found that while developing a similar project at an alternative site is possible, this would not meet a major objective of the project, making use of the existing site and infrastructure to the extent feasible. Staff also considered whether locating the project at an alternative site would substantially lessen any identified significant impacts of the project. While an alternative site would reduce or eliminate the project's impacts to coastal resources, staff believes that alternative means to reduce or avoid those impacts are available that would allow the project to make use of the existing infrastructure at the ESGS site. Based on these two factors, staff has applied the "rule of reason" and determined that a detailed alternative sites analysis is not needed.

FACILITY DESIGN ALTERNATIVES

ESPR analyzed six facility design alternatives to its proposed project that made use of the existing facility but represented significant design differences from the proposal. Staff has considered those six alternatives as well, namely: plant configurations/arrangements, simple replacement of the existing boilers, other base-load combined cycle capacity, alternative wastewater disposal, alternative cooling technologies, and alternative air emission control technologies. These alternatives are discussed in detail in the various engineering sections of the FSA. Staff also evaluated the use of reclaimed water in place of sea water in the once-through cooling system. This evaluation is included in an appendix to the **BIOLOGICAL RESOURCES** section. Staff has determined that the alternative facility designs, with the exception of alternate cooling, are inferior to the proposed design and would not lessen the impacts of the proposed project.

RELATED FACILITIES ALTERNATIVES

Natural Gas Supply Pipeline

The current natural gas supply to the existing plant is sufficient to supply the proposed combined cycle units.

Wastewater Disposal

ESPR proposes to discharge wastewater through a new 12-inch water pipeline into the City of Manhattan Beach Sanitary Sewer system. No alternatives for the wastewater disposal were considered in this analysis.

Transmission Lines

ESPR proposes to connect to the regional electric transmission grid through the adjacent SCE switchyard. No additional transmission lines and no transmission line upgrades are required to accommodate the output of the proposed facility.

TECHNOLOGY ALTERNATIVES

Conservation and Demand-Side Management

Conservation and demand-side management (DSM) include a variety of approaches, including energy efficiency and conservation, building and appliance standards, load management and fuel substitution. Public Resources Code Section 25305(c) states that conservation, load management, or other demand reducing measures reasonably expected to occur shall be explicitly examined in the Energy Commission's energy forecasts and shall not be considered as alternatives to a proposed facility during the siting process. The forecast that will address this issue is the Energy Commission's California Energy Outlook. Thus, such alternatives are not included in this analysis.

Since 1975, the displaced peak demand from all of these efforts has been roughly the equivalent of eighteen 500-MW power plants. At a state level, 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. Savings from energy efficiency programs implemented by utilities and state agencies have also increased (from 750 MW to 3,300 MW). Recent demand reducing proposals from the Governor and Legislature have proven to have an impact by reducing consumption by an average of 3,500 MW during the summer of 2001 (CEC 2002a). In addition, voluntary conservation measures adopted by residential and commercial/industrial users led to a 7.5 percent drop in electricity use throughout the state as of August 2001, but that dropped to 1.5 percent in October 2001 (CEC 2002a). There was a 0.7 percent increase in energy used in February 2002 compared to February 2001 (CEC 2002b). However, in comparison to February 2000, there was a 5.5 percent decrease in energy consumption in February 2002 (CEC 2002b).

Generation Technology Alternatives

Staff compared various alternative technologies with the proposed project, scaled to meet the project's objectives. Technologies examined were those principal electricity generation technologies that do not burn fossil fuels such as geothermal, solar and wind. Each of these technologies could be attractive from an environmental perspective because of the absence or reduced level of air pollutant emissions.

Renewable Energy Alternatives

Solar and wind resources require large land areas in order to generate 630 MW of electricity. Specifically, utility scale solar thermal projects require between four and ten acres per megawatt depending on the type of system (parabolic trough, parabolic dish, or central receiver) (CEC 1996, pp. B.15.1-2). A project comparable to ESPR's proposed 630 MW would require more than 2,800 acres, or more than 80 times the amount of space taken by the proposed plant site. Wind generation "farms" generally require about 17 acres per megawatt, with 630 MW requiring more than 10,000 acres, more than 300 times the amount of space taken by the proposed plant site and linear facilities (CEC

1996, pp. B.16.1). The alternative technologies discussed above have the potential for significant land use impacts due to the large land areas required. Consequently, staff does not believe that solar and wind technologies present feasible alternatives to the proposed project.

Geothermal Resources

Geothermal resources are available in limited areas of California. The primary geothermal resources in southern California are present in Imperial County, primarily in the Imperial Valley (CEC 2000). Sixteen geothermal power plants with a combined online capacity of approximately 480 MW are present in Imperial County (CEC 2000). The Energy Commission has recently received an AFC for a new 185 MW geothermal power plant project in Imperial County, the Salton Sea Unit 6 project (02-AFC-02). While this AFC demonstrates that development of additional geothermal resources in southeastern California is possible, geothermal power is not a feasible alternative at the scale of the proposed 630 MW El Segundo Power Redevelopment Project.

THE “NO PROJECT” ALTERNATIVE

CEQA Guidelines and Energy Commission regulations require consideration of the “no project” alternative. This alternative assumes that the project is not constructed, and is compared to the proposed project. A determination is made whether the “no project” alternative is superior, equivalent, or inferior to the proposed project.

In the AFC, ESPR evaluated the “no project” alternative and determined that it would make less efficient use of the region’s infrastructure and energy resources (ESPR 2000a, AFC page 5-1). Without construction of the new units, the existing ESPR would operate the existing power plant at times of peak demand. Electricity demand, which is expected to grow in southern California in particular, would be met either by increased use of existing facilities or the development of other new power plants.

Staff views the “no project” alternative as feasible. If this project is not built, the same market conditions that encouraged it to be proposed would likely encourage other similar projects. It is quite feasible that a substantial amount of additional generating capacity will be proposed even in the absence of this project. Staff can reasonably expect California’s need for new plants to be filled with or without the proposed project. There is no reason to assume that the total amount of capacity actually built would differ with or without this project.

It follows then, that the extent to which nuclear and older fossil generation resources will be replaced by new resources can be expected to be the same with or without this project. The extent to which generation from existing power plants would consume fuel and emit pollutants would be the same with or without this project. And whatever effect new plants might have insulating ratepayers and taxpayers from risk will occur whether or not the proposed plant is included among the new plants actually built.

The “no project” alternative would eliminate the expected economic benefits that the proposed project would bring to City of El Segundo and Los Angeles County. These include estimated property tax revenues of approximately \$5 million per year to be split between the city, county, and various local districts (ESPR 2000a). Construction

equipment and materials purchases are estimated to be between \$250 million and \$290 million, with approximately \$20 million in sales tax revenues generated for the City of El Segundo and Los Angeles County. ESPR estimates an operations payroll starting at approximately \$2 million per year for the first year of operation (ESPR 2000a).

Staff notes that the “no project” alternative would eliminate the project’s benefits and result in continued operation of the existing Units 1 and 2. This would also continue the coastal resources impacts from the existing, less efficient units. Given the degree of impact to coastal resources from the proposed project, the lack of adequate information on project-specific biological impacts to determine what mitigation might be appropriate, and the lack of an adequate package to mitigate air quality impacts, staff prefers the “no project” alternative to construction and operation of the project as currently proposed. Staff believes that absent current and reliable aquatic biology information from a 316b-like study to determine appropriate mitigation, the project can and should be amended to reduce or avoid the significant environmental impacts. With such changes to the project and the overall benefits of the project, staff would prefer the reclaimed water for once-through alternative to the “no project” alternative.

CONCLUSIONS REGARDING ALTERNATIVES

Staff has analyzed in detail alternatives to the project design and related facilities, alternative technologies, and the “no project” alternative. Staff did not analyze in detail alternative sites for the project. Staff determined that developing the project at an alternative site would not allow ESPR to make use of infrastructure at the existing site, one of the objectives of the project, and that the potentially significant impacts of the proposed project would either not be substantially reduced at a new site or could be adequately addressed by technology alternatives at the existing site.

Staff prefers and recommends once-through cooling use of reclaimed water alternative to the project as currently proposed. Staff has separately analyzed the potential use of reclaimed water in place of sea water for once through cooling (see Appendix A of the **BIOLOGICAL RESOURCES** section). If the project were amended to use reclaimed water, the adverse biological impacts would be avoided. Staff does not believe that energy efficiency measures and alternative technologies (geothermal, solar, wind, and hydroelectric) present any feasible alternatives to the proposed project.

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GENERAL CONDITIONS INCLUDING COMPLIANCE MONITORING AND CLOSURE PLAN

Testimony of Donna Stone

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 air and water quality, public health and safety, environmental and other applicable regulations, guidelines, and conditions adopted or established by the California Energy Commission (Energy Commission) and specified in the written decision on the Application for Certification or otherwise required by law.

The Compliance Plan is composed of the following elements:

1. General conditions that:
 - set forth the duties and responsibilities of the Compliance Project Manager (CPM), the project owner, delegate agencies, and others;
 - set forth the requirements for handling confidential records and maintaining the compliance record;
 - state procedures for settling disputes and making post-certification changes;
 - state the requirements for periodic compliance reports and other administrative procedures that are necessary to verify the compliance status for all Energy Commission approved conditions; and
 - establish requirements for facility closure plans.
2. Specific conditions of certification that follow each technical area contain the measures required to mitigate any and all potential adverse project impacts associated with construction, operation and closure to an insignificant level. Each specific condition of certification also includes a verification provision that describes the method of assuring that the condition has been satisfied.

GENERAL CONDITIONS OF CERTIFICATION

DEFINITIONS

To ensure consistency, continuity and efficiency, the following terms, as defined, apply to all technical areas, including Conditions of Certification:

SITE MOBILIZATION

Moving trailers and related equipment onto the site, usually accompanied by minor ground disturbance, grading for the trailers and limited vehicle parking, trenching for

construction utilities, installing utilities, grading for an access corridor, and other related activities. Ground disturbance, grading, etc. for site mobilization are limited to the portion of the site necessary for placing the trailers and providing access and parking for the occupants. Site mobilization is for temporary facilities and is, therefore, not considered construction.

GROUND DISTURBANCE

Onsite activity that results in the removal of soil or vegetation, boring, trenching or alteration of the site surface. This does not include driving or parking a passenger vehicle, pickup truck, or other light vehicle, or walking on the site.

GRADING

Onsite activity conducted with earth-moving equipment that results in alteration of the topographical features of the site such as leveling, removal of hills or high spots, or moving of soil from one area to another.

CONSTRUCTION

[From section 25105 of the Warren-Alquist Act.] Onsite work to install permanent equipment or structures for any facility. Construction does **not** include the following:

- the installation of environmental monitoring equipment;
- a soil or geological investigation;
- a topographical survey;
- any other study or investigation to determine the environmental acceptability or feasibility of the use of the site for any particular facility; or
- any work to provide access to the site for any of the purposes specified in a., b., c., or d.

START OF COMMERCIAL OPERATION

For compliance monitoring purposes, “commercial operation” is that phase of project development which begins after the completion of start-up and commissioning, where the power plant has reached steady-state production of electricity with reliability at the rated capacity. For example, at the start of commercial operation, plant control is usually transferred from the construction manager to the plant operations manager.

COMPLIANCE PROJECT MANAGER RESPONSIBILITIES

A Compliance Project Manager (CPM) will oversee the compliance monitoring and 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 staff and management.

The Energy Commission has established a toll free compliance telephone number of **1-800-858-0784** for the public to contact the Energy Commission about power plant construction or operation-related questions, complaints or concerns.

Pre-Construction and Pre-Operation Compliance Meeting

The CPM may schedule pre-construction and pre-operation compliance meetings prior to the projected start-dates of construction, plant operation, or both. The purpose of these meetings will be to assemble both the Energy Commission's and the project owner's technical staff to review the status of all pre-construction or pre-operation requirements contained in the Energy Commission's conditions of certification to confirm that they have been met, or if they have not been met, to ensure that the proper action is taken. In addition, these meetings shall ensure, to the extent possible, that Energy Commission conditions will not delay the construction and operation of the plant due to oversight and to preclude any last minute, unforeseen issues from arising. Pre-construction meetings held during the certification process must be publicly noticed unless they are confined to administrative issues and processes.

Energy Commission Record

The Energy Commission shall maintain as a public record, in either the Compliance file or Docket file, for the life of the project (or other period as required):

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

PROJECT OWNER RESPONSIBILITIES

It is the responsibility of the project owner to ensure that the general compliance conditions and the conditions of certification are satisfied. The general compliance conditions regarding post-certification changes specify measures that the project owner must take when requesting changes in the project design, compliance conditions, or ownership. Failure to comply with any of the conditions of certification or the general compliance conditions may result in reopening of the case and revocation of Energy Commission certification, an administrative fine, or other action as appropriate. A summary of the General Conditions of Certification is included as **Compliance Table 1**

at the conclusion of this section. The designation after each of the following summaries of the General Compliance Conditions (**Com-1, Com-2, etc.**) refers to the specific General Compliance Condition contained in **Compliance Table 1**.

Access, Compliance Condition of Certification, COM-1

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, COM-2

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.

Reporting of Unplanned Outages, COM-3

Throughout the life of the project, the project owner shall immediately report all unplanned outages, via e-mail to the Compliance Program Manager and to the CPM. The expected duration and reason for the outage shall be included in the report. Contact shall be made as follows:

- Compliance Program Manager
E-mail: cnajaria@energy.state.ca.us telephone: (916) 654-4079
- Compliance Project Manager
E-mail: dstone@energy.state.ca.us, telephone: (916) 654-4745

Compliance Verification Submittals, COM-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:

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

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

Compliance Reporting, COM-6 and COM-7

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

Compliance Matrix, COM-6 and COM-7

A compliance matrix shall be submitted by the project owner to the CPM along with each monthly and annual compliance report. The compliance matrix is intended to provide the CPM with the current status of all compliance conditions in a spreadsheet format. The compliance matrix must identify:

1. the technical area;
2. the condition number;

3. a brief description of the verification action or submittal required by the condition;
4. the date the submittal is required (e.g., 60 days prior to construction, after final inspection, etc.);
5. the expected or actual submittal date;
6. the date a submittal or action was approved by the Chief Building Official (CBO), CPM, or delegate agency, if applicable;
7. the compliance status of each condition (e.g., “not started,” “in progress” or “completed” (include the date); and
8. the project’s preconstruction and construction milestones, including dates and status.

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.

Pre-Construction Matrix, COM-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 and Operation Security Plan, COM-8

Prior to commencing construction, a site-specific Security Plan for the construction phase shall be developed and maintained at the project site. Prior to commercial operation, a site-specific Security Plan for the operational phase shall be developed and maintained at the project site. The plans may be reviewed at the site by the CPM during compliance inspections.

Construction Security Plan

The Construction Security Plan must address:

1. site fencing enclosing the construction area;
2. use of security guards;
3. check-in procedure or tag system for construction personnel and visitors;
4. protocol for contacting law enforcement and the CPM in the event of suspicious activity or emergency; and
5. evacuation procedures.

Operation Security Plan

The Operations Security Plan must address:

1. permanent site fencing and security gate;
2. use of security guards;
3. security alarm for critical structures;

4. protocol for contacting law enforcement and the CPM in the event of suspicious activity or emergency;
5. evacuation procedures;
6. perimeter breach detectors and on-site motion detectors;
7. video or still camera monitoring system; and
8. fire alarm monitoring system.

The CPM may authorize modifications to these measures, or may require additional measures depending on circumstances unique to the facility, and in response to industry-related security concerns.

Tasks Prior to Start of Construction, COM-5

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.

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

Monthly Compliance Report, COM-6

The first Monthly Compliance Report is due one month following the Energy Commission business meeting date on which the project was approved, unless otherwise agreed to by the CPM. The first Monthly Compliance Report shall include an initial list of dates for each of the events identified on the Key Events List. The Key Events List is found at the end of this section.

During pre-construction and construction of the project, the project owner or authorized agent shall submit an original and five copies of the Monthly Compliance Report within 10 working days after the end of each reporting month. Monthly Compliance Reports shall be clearly identified for the month being reported. The reports shall contain, at a minimum:

1. a summary of the current project construction status, a revised/updated schedule if there are significant delays, and an explanation of any significant changes to the schedule;

2. documents required by specific conditions to be submitted along with the Monthly Compliance Report. Each of these items must be identified in the transmittal letter, and should be submitted as attachments to the Monthly Compliance Report;
3. an initial, and thereafter updated, compliance matrix which shows the status of all conditions of certification and preconstruction 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 which satisfied the condition;
5. a list of any submittal deadlines that were missed accompanied by an explanation and an estimate of when the information will be provided;
6. a cumulative listing of any approved changes to conditions of certification;
7. a listing of any filings with, or permits issued by, other governmental agencies during the month;
8. a projection of project compliance activities scheduled during the next two months. The project owner shall notify the CPM as soon as any changes are made to the project construction schedule that would affect compliance with conditions of certification or milestones;
9. a listing of the month's additions to the on-site compliance file; and
10. any requests to dispose of items that are required to be maintained in the project owner's compliance file.

Annual Compliance Report, COM-7

After the air district has issued a Permit to Operate, the project owner shall submit Annual Compliance Reports instead of Monthly Compliance Reports. The reports are for each year of commercial operation and are due to the CPM each year at a date agreed to by the CPM. Annual Compliance Reports shall be submitted over the life of the project unless otherwise specified by the CPM. Each Annual Compliance Report shall identify the reporting period and shall contain the following:

1. an updated compliance matrix which shows the status of all conditions of certification (fully satisfied and/or closed conditions do not need to be included in the matrix after they have been reported as closed);
2. a summary of the current project operating status and an explanation of any significant changes to facility operations during the year;
3. documents required by specific conditions to be submitted along with the Annual Compliance Report. Each of these items must be identified in the transmittal letter, and should be submitted as attachments to the Annual Compliance Report;
4. a cumulative listing of all post-certification changes approved by the Energy Commission or cleared by the CPM;
5. an explanation for any submittal deadlines that were missed, accompanied by an estimate of when the information will be provided;
6. a listing of filings made to, or permits issued by, other governmental agencies during the year;

7. a projection of project compliance activities scheduled during the next year;
8. a listing of the year's additions to the on-site compliance file;
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.
11. a listing of all outages planned for the coming year and a listing of all outages that occurred during the previous year, including the anticipated duration and the reason for each outage occurrence.

Confidential Information, COM-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.

Department of Fish and Game Filing Fee, COM-10

Pursuant to the provisions of Fish and Game Code Section 711.4, the project owner shall pay a filing fee in the amount of \$850. The payment instrument shall be provided to the Energy Commission's Project Manager (PM), not the CPM, at the time of project certification and shall be made payable to the California Department of Fish and Game. The PM will submit the payment to the Office of Planning and Research at the time of filing of the notice of decision pursuant to Public Resources Code Section 21080.5.

Reporting of Complaints, Notices, and Citations, COM-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 inquiries shall be responded to within 24 hours. The telephone number shall be posted at the project site and made easily visible to passersby during 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 of all complaint forms, notices of violation, notices of fines, official warnings, and citations, within 10 days of receipt, to the CPM. Complaints shall be logged and numbered. Noise complaints shall be

recorded on the form provided in the **NOISE** conditions of certification. All other complaints shall be recorded on the complaint form (Attachment A).

CONSTRUCTION MILESTONES, COM-15

The following is the procedure for establishing and enforcing milestones, which include milestone dates for pre-construction and construction phases of the project. As noted in the **Air Quality** section of this FSA, the use of Priority Reserve emission reduction credits would require the applicant to be fully and legally operational within three years of the Commission's final decision. Therefore, construction milestones have been included as noted below. This issue may be revisited in the Presiding Members Final Decision depending on the applicant's final offset strategy. Milestones and method of verification must be established and agreed upon by the project owner and the CPM no later than 30 days after docketing of the Commission's final decision. If this deadline is not met, the CPM will establish the milestones.

I. ESTABLISH PRE-CONSTRUCTION MILESTONES TO ENABLE START OF CONSTRUCTION WITHIN ONE YEAR OF CERTIFICATION

1. Obtain site control.
2. Obtain financing.
3. Mobilize site.
4. Begin rough grading for permanent structures (start of construction).

II. ESTABLISH CONSTRUCTION MILESTONES FROM DATE OF START OF CONSTRUCTION

1. Begin pouring major foundation concrete.
2. Begin installation of major equipment.
3. Complete installation of major equipment.
4. Begin gas pipeline construction.
5. Complete gas pipeline interconnection.
6. Begin T-line construction.
7. Complete T-line interconnection.
8. Begin commercial operation.

Facility Closure, COM-12 and COM-13

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, COM-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 twelve months prior to commencement of closure activities (or other period of time agreed to by the CPM). The project owner shall file 120 copies (or other number of copies agreed upon by the CPM) of a proposed facility closure plan with the Energy Commission.

The plan shall:

1. identify and discuss any impacts and mitigation to address significant adverse impacts associated with proposed closure activities and to address facilities, equipment, or other project related remnants that will remain at the site;
2. identify a schedule of activities for closure of the power plant site, transmission line corridor, and all other appurtenant facilities constructed as part of the project;
3. identify any facilities or equipment intended to remain on site after closure, the reason, and any future use; and
4. address conformance of the plan with all applicable laws, ordinances, regulations, standards, local/regional plans in existence at the time of facility closure, and applicable conditions of certification.

In the event that there are significant issues associated with the proposed facility closure plan's approval, or the desires of local officials or interested parties are inconsistent with the plan, the CPM shall hold one or more workshops and/or the Energy Commission may hold public hearings as part of its approval procedure.

In addition, prior to submittal of the proposed facility closure plan, a meeting shall be held between the project owner and the Energy Commission CPM for the purpose of discussing the specific contents of the plan.

As necessary, prior to or during the closure plan process, the project owner shall take appropriate steps to eliminate any immediate threats to public health and safety and the environment, but shall not commence any other closure activities, until Energy Commission approval of the facility closure plan is obtained.

Unplanned Temporary Closure/On-Site Contingency Plan, COM-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 twelve months, a closure plan consistent with the requirements for a planned closure shall be developed and submitted to the CPM within 90 days of the CPM's determination (or other period of time agreed to by the CPM).

Unplanned Permanent Closure/On-Site Contingency Plan, COM-13

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, Commission staff acts as, and has the authority of, the Chief Building Official (CBO). Commission staff may delegate CBO responsibility to either an independent third party contractor or the local building official. Commission staff retains CBO authority when selecting a delegate CBO including enforcing and interpreting state and local codes, and use of discretion, as necessary, in implementing the various codes and standards.

Commission staff may also seek the cooperation of state, regional and local agencies that have an interest in environmental control when conducting project monitoring.

Enforcement

The Energy Commission's legal authority to enforce the terms and conditions of its Decision is specified in Public Resources Code sections 25534 and 25900. The Energy Commission may amend or revoke the certification for any facility, and may impose a civil penalty for any significant failure to comply with the terms or conditions of the Energy Commission Decision. The specific action and amount of any fines the Energy Commission may impose would take into account the specific circumstances of the incident(s). This would include such factors as the previous compliance history,

whether the cause of the incident involves willful disregard of LORS, oversight, unforeseeable events, and other factors the Energy Commission may consider. Moreover, to ensure compliance with the terms and conditions of certification and applicable LORS, delegate agencies are authorized to take any action allowed by law in accordance with their statutory authority, regulations, and administrative procedures.

Noncompliance Complaint Procedures

Any person or agency may file a complaint alleging noncompliance with the conditions of certification. Such a complaint will be subject to review by the Energy Commission pursuant to Title 20, California Code of Regulations, section 1230 et seq., but in many instances the noncompliance can be resolved by using the informal dispute resolution process. Both the informal and formal complaint procedure, as described in current State law and regulations, are described below. They shall be followed unless superseded by current law or regulations.

Informal Dispute Resolution Procedure

The following procedure is designed to informally resolve disputes concerning the interpretation of compliance with the requirements of this compliance plan. The project owner, the Energy Commission, or any other party, including members of the public, may initiate this procedure for resolving a dispute. Disputes may pertain to actions or decisions made by any party including the Energy Commission's delegate agents.

This procedure may precede the more formal complaint and investigation procedure specified in Title 20, California Code of Regulations, section 1230 et seq., but is not intended to be a substitute for, or prerequisite to it. This informal procedure may not be used to change the terms and conditions of certification as approved by the Energy Commission, although the agreed upon resolution may result in a project owner, or in some cases the Energy Commission staff, proposing an amendment.

The procedure encourages all parties involved in a dispute to discuss the matter and to reach an agreement resolving the dispute. If a dispute cannot be resolved, then the matter must be referred to the full Energy Commission for consideration via the complaint and investigation process. The procedure for informal dispute resolution is as follows:

Request for Informal Investigation

Any individual, group, or agency may request 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 of the results

of the investigation, including corrective measures proposed or undertaken, to the CPM. Depending on the urgency of the noncompliance matter, the CPM may conduct a site visit and/or request the project owner to provide an initial report, within 48 hours, followed by a written report filed within seven days.

Request for Informal Meeting

In the event that either the party requesting an investigation or the Energy Commission staff is not satisfied with the project owner's report, investigation of the event, or corrective measures undertaken, either party may submit a written request to the CPM for a meeting with the project owner. Such request shall be made within 14 days of the project owner's filing of its written report. Upon receipt of such a request, the CPM shall:

1. immediately schedule a meeting with the requesting party and the project owner, to be held at a mutually convenient time and place;
2. secure the attendance of appropriate Energy Commission staff and staff of any other agencies with expertise in the subject area of concern, as necessary;
3. conduct such meeting in an informal and objective manner so as to encourage the voluntary settlement of the dispute in a fair and equitable manner; and
4. after the conclusion of such a meeting, promptly prepare and distribute copies to all in attendance and to the project file, a summary memorandum which fairly and accurately identifies the positions of all parties and any conclusions reached. If an agreement has not been reached, the CPM shall inform the complainant of the formal complaint process and requirements provided under Title 20, California Code of Regulations, section 1230 et seq.

Formal Dispute Resolution Procedure-Complaints and Investigations

If either the project owner, Energy Commission staff, or the party requesting an investigation is not satisfied with the results of the informal dispute resolution process, such party may file a complaint or a request for an investigation with the Energy Commission's General Counsel. Disputes may pertain to actions or decisions made by any party including the Energy Commission's delegate agents. Requirements for complaint filings and a description of how complaints are processed are in Title 20, California Code of Regulations, section 1230 et seq.

The Chairman, upon receipt of a written request stating the basis of the dispute, may grant a hearing on the matter, consistent with the requirements of noticing provisions. The Energy Commission shall have the authority to consider all relevant facts involved and make any appropriate orders consistent with its jurisdiction (Cal. Code Regs., tit 20, §§ 1232-1236).

POST CERTIFICATION CHANGES TO THE ENERGY COMMISSION DECISION: AMENDMENTS, INSIGNIFICANT PROJECT CHANGES AND VERIFICATION CHANGES, COM-14

The project owner must petition the Energy Commission, pursuant to Title 20, California Code of Regulations, section 1769, to 1) delete or change a condition of certification; 2) modify the project design or operational requirements; and 3) transfer ownership or operational control of the facility.

A petition is required for **amendments** and for **insignificant project changes**. For verification changes, a letter from the project owner is sufficient. In all cases, the petition or letter requesting a change should be submitted to the Energy Commission's Docket in accordance with Title 20, California Code of Regulations, section 1209.

The criteria that determine which type of change process applies are explained below.

Amendment

A proposed change will be processed as an amendment if it involves a change to the requirement or protocol, or in some cases the verification portion of a condition of certification, an ownership or operator change, or a potential significant environmental impact.

Insignificant Project Change

The proposed change will be processed as an insignificant project change if it does not require changing the language in a condition of certification, have a potential for significant environmental impact, and cause the project to violate laws, ordinances, regulations or standards.

Verification Change

As provided in Title 20, Section 1770 (d), California Code of Regulations, a verification may be modified by staff without requesting an amendment to the decision if the change does not conflict with the conditions of certification.

KEY EVENTS LIST, COM-6

PROJECT: **El Segundo Power Plant Project**

DOCKET #: 00-AFC-14

COMPLIANCE PROJECT MANAGER:

EVENT DESCRIPTION

DATE

Certification Date/Obtain Site Control	
Online Date	
POWER PLANT SITE ACTIVITIES	
Start Site Mobilization	
Start Ground Disturbance	
Start Grading	
Start Construction	
Begin Pouring Major Foundation Concrete	
Begin Installation of Major Equipment	
Completion of Installation of Major Equipment	
First Combustion of Gas Turbine	
Start Commercial Operation	
Complete All Construction	
TRANSMISSION LINE ACTIVITIES	
Start T/L Construction	
SYNCHRONIZATION WITH GRID AND INTERCONNECTION	
COMPLETE T/L CONSTRUCTION	
FUEL SUPPLY LINE ACTIVITIES	
Start Gas Pipeline Construction and Interconnection	
COMPLETE GAS PIPELINE CONSTRUCTION	
WATER SUPPLY LINE ACTIVITIES	
START WATER SUPPLY LINE CONSTRUCTION	
COMPLETE WATER SUPPLY LINE CONSTRUCTION	

**TABLE 1
COMPLIANCE SECTION
SUMMARY of GENERAL CONDITIONS OF CERTIFICATION**

CONDITION NUMBER	PAGE #	SUBJECT	DESCRIPTION
COM-1	4	ACCESS	THE PROJECT OWNER SHALL GRANT ENERGY COMMISSION STAFF AND DELEGATE AGENCIES OR CONSULTANTS UNRESTRICTED ACCESS TO THE POWER PLANT SITE.
COM-2	4	COMPLIANCE RECORD	THE PROJECT OWNER SHALL MAINTAIN PROJECT FILES ON-SITE. ENERGY COMMISSION STAFF AND DELEGATE AGENCIES SHALL BE GIVEN UNRESTRICTED ACCESS TO THE FILES.
COM-3	4	REPORTING OF UNPLANNED OUTAGES	THROUGHOUT THE LIFE OF THE PROJECT, THE PROJECT OWNER SHALL REPORT ALL UNPLANNED OUTAGES VIA E-MAIL TO THE COMPLIANCE PROGRAM MANAGER AND TO THE CPM IMMEDIATELY.
COM-4	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.
COM-5	6, 7	PRECONSTRUCTION SUBMITTALS	<p>CONSTRUCTION SHALL NOT COMMENCE UNTIL THE ALL OF THE FOLLOWING ACTIVITIES/SUBMITTALS HAVE BEEN COMPLETED:</p> <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.
COM-6	5, 6, 7	COMPLIANCE REPORTING DURING CONSTRUCTION: MONTHLY COMPLIANCE REPORTS	DURING CONSTRUCTION, THE PROJECT OWNER SHALL SUBMIT MONTHLY COMPLIANCE REPORTS (MCRs) WHICH INCLUDE SPECIFIC INFORMATION. THE FIRST MCR IS DUE THE MONTH FOLLOWING THE COMMISSION BUSINESS MEETING DATE ON WHICH THE PROJECT WAS APPROVED AND SHALL INCLUDE AN INITIAL LIST OF DATES FOR EACH OF THE EVENTS IDENTIFIED ON THE KEY EVENTS LIST.

CONDITION NUMBER	PAGE #	SUBJECT	DESCRIPTION
COM-7	5, 6, 8	COMPLIANCE REPORTING DURING OPERATION: ANNUAL COMPLIANCE REPORTS	AFTER CONSTRUCTION ENDS AND THROUGHOUT THE LIFE OF THE PROJECT, THE PROJECT OWNER SHALL SUBMIT ANNUAL COMPLIANCE REPORTS (ACRs) WHICH INCLUDE SPECIFIC INFORMATION. THE FIRST ACR IS DUE AFTER THE AIR DISTRICT HAS ISSUED A PERMIT TO OPERATE.
COM-8	6	SECURITY PLANS	PRIOR TO COMMENCING CONSTRUCTION, THE PROJECT OWNER SHALL SUBMIT A CONSTRUCTION SECURITY PLAN. PRIOR TO COMMENCING OPERATION, THE PROJECT OWNER SHALL SUBMIT AN OPERATION SECURITY PLAN.
COM-9	9	CONFIDENTIAL INFORMATION	ANY INFORMATION THE PROJECT OWNER DEEMS CONFIDENTIAL SHALL BE SUBMITTED TO THE COMMISSION'S DOCKETS UNIT.
COM-10	9	DEPT OF FISH AND GAME FILING FEE	THE PROJECT OWNER SHALL PAY A FILING FEE OF \$850 AT THE TIME OF PROJECT CERTIFICATION.
COM-11	10	REPORTING OF COMPLAINTS, NOTICES AND CITATIONS	WITHIN 10 DAYS OF RECEIPT, THE PROJECT OWNER SHALL REPORT TO THE CPM, ALL NOTICES, COMPLAINTS, AND CITATIONS.
COM-12	11, 12	PLANNED FACILITY CLOSURE	THE PROJECT OWNER SHALL SUBMIT A CLOSURE PLAN TO THE CPM AT LEAST TWELVE MONTHS PRIOR TO COMMENCEMENT OF A PLANNED CLOSURE.
COM-13	11, 12, 13	UNPLANNED FACILITY CLOSURE	To ensure that public health and safety and the environment are protected in the event of an unplanned closure (either temporary or permanent) the project owner shall submit an on-site contingency plan no less than 60 days prior to commencement of commercial operation.
COM-14	16	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.
COM-15	10	PRE-CONSTRUCTION AND CONSTRUCTION MILESTONES	THE PROJECT OWNER MUST ESTABLISH MILESTONES FOR PRE-CONSTRUCTION AND CONSTRUCTION PHASES OF THE PROJECT.

COMPLAINT REPORT/RESOLUTION FORM

PROJECT NAME: EI Segundo Power Plant Project AFC Number: 00-AFC-14
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.)