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EL SEGUNDO ENERGY CENTER

Final Staff Assessment Part A for the El Segundo Power Facility Modification Amendment to the El Segundo Energy Center

CALIFORNIA
ENERGY COMMISSION
Edmund G. Brown Jr, Governor

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(00-AFC-14C)
FINAL STAFF ASSESSMENT PART A

EXECUTIVE SUMMARY

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INTRODUCTION

This Final Staff Assessment (FSA) **Part A** is being published by California Energy Commission (Energy Commission) staff for the proposed amendment to the El Segundo Energy Center (ESEC) site. The FSA Part A contains all technical sections with the exception of Air Quality which will be published in a subsequent FSA **Part B**. The Air Quality analysis is dependent on changes to gas turbine startup that the project owner is seeking from the South Coast Air Quality Management District (SCAQMD) through the Title V Renewal process, and in a Petition to Amend that will be filed with the Energy Commission to obtain parallel changes to the Air Quality Conditions of Certification. Once these proposed changes are reviewed by SCAQMD and the Energy Commission, staff will complete the Air Quality analysis and publish the FSA Part B. For additional information please see the Air Quality heading below.

The El Segundo Energy Center, L.L.C. (ESEC LLC), project owner proposes to replace utility boiler Units 3 and 4 at the ESEC, with one new combined-cycle generator (Unit 9), one new steam turbine generator (Unit 10), and two new simple-cycle gas turbines (Units 11 and 12), totaling 449 megawatts (MW). The amendment, also known as the El Segundo Power Facility Modification (ESPFM) or the ESEC amendment, proposes the demolition of Units 3 and 4, to be replaced with Units 9, 10, 11, and 12, and the replacement of a once-through seawater cooling system with dry-cooling technology.

This FSA Part A contains staff's independent, objective evaluation of ESEC LLC's Petition to Amend (PTA) (00-AFC-14C). The analyses are similar to those normally contained in an Environmental Impact Report (EIR) required by the California Environmental Quality Act (CEQA).

For an amendment to an existing power plant over which it has regulatory oversight, the Energy Commission is the lead state agency under CEQA. The Energy Commission's certified regulatory program provides the environmental analysis that satisfies CEQA requirements. In fulfilling this responsibility, Energy Commission staff provides an independent assessment of the amendment's engineering design, evaluates its potential effects on the environment and on public health and safety, and determines whether the project, if modified, would remain in conformance with the conditions of certification in the Energy Commission Final Decision and all applicable local, state, and federal laws, ordinances, regulations and standards (LORS). Energy Commission staff also recommends any needed modifications to existing mitigation measures in the Energy Commission Final Decision and proposes additional conditions of certification for the revised Final Decision to mitigate any significant adverse environmental effects of the proposed modifications.

This FSA Part A is not the decision document for these proceedings, nor does it contain findings of the Energy Commission related to environmental impacts or the project's compliance with local, state, and federal LORS. The FSA Part A incorporates and

addresses comments that were received during the Preliminary Staff Assessment (PSA) comment period. The FSA (Part A and B) is only one piece of evidence that will be considered by the Committee (two Energy Commission 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.

In the evidentiary hearings, the Committee will consider the recommendations presented by staff, the petitioner, intervenors, governmental agencies, tribes, and the public prior to submitting its proposed decision (Presiding Member's Proposed Decision (PMPD)) to the full Commission. Following a public hearing(s), the full Energy Commission will make a final decision on the proposed modifications.

PROPOSED PROJECT LOCATION AND DESCRIPTION

The site is located at the southernmost city limit of the city of El Segundo on the coast of the Pacific Ocean, between Dockweiler State Beach and the city of Manhattan Beach, in Los Angeles County.

Primary changes to the ESEC include the demolition and replacement of two once-through-cooled natural gas-fired utility boiler units (Units 3 and 4) with one new combined cycle generator (Unit 9), one steam turbine generator (Unit 10) and two simple-cycle gas turbines (Units 11 and 12). This change will eliminate the use of ocean water for once-through cooling at the facility. The proposed changes will also upgrade and improve the ESEC's site infrastructure, provide fast start and dispatch flexibility capabilities to support Southern California grid load balancing and renewable energy integration, and implement improvements to coastal access. This amendment would result in a total ESEC generating capacity of 1,022 MW gross.

Specific changes proposed through this PTA include:

- Shutdown and demolition of Units 3 and 4;
- Removal and remediation of existing ESEC retention basins;
- Construction of a new, combined administration, maintenance, and operations support building;
- Modifications to existing site access; and
- Improvements to beach access.

The following new major equipment will be installed:

- (Unit 9) - One NRG fast start combined-cycle generator unit (CC Fast), rated at 222 MW net, incorporating a General Electric natural gas combustion turbine generator designed to achieve 75 percent of base load output in 10 minutes;
- One two-pressure, duct-fired heat recovery steam generator (HRSG) designed for rapid startup with conventional selective catalytic reduction system (SCR)/carbon monoxide (CO) catalysts;

- (Unit 10) - One single-case, non-reheat axial exhaust admission condensing steam turbine generator (STG) rated at 112 MW and designed for non-traditional elevated condensing pressure to minimize cooling system size;
- One Heller dry cooling tower system;
- (Units 11 and 12) - Two Rolls Royce Trent 60 generators, rated at 55 MW/unit net, consisting of advanced aeroderivative simple-cycle gas turbines; and
- One Cleaver Brooks auxiliary boiler consisting of a direct contact spray condenser and a mechanically-induced-draft dry-cooling tower.

PURPOSE AND NEED FOR AN AMENDMENT

The purpose of the 2013 ESEC PTA is to decommission one unit (Unit 4)[1], demolish two units (Units 3 and 4), and add fast-start and dispatch flexibility capabilities through the installation of 435 MW net (449 MW gross) of more efficient generation. This PTA proposes the replacement of steam boilers scheduled to retire by December 31, 2015, to meet the state's once-through-cooling policy compliance deadline for ESEC. With the expected shutdown of other once-through-cooling units in the Los Angeles Basin, new generation at this location is intended to meet in-basin needs and the need for fast-start capability to complement the integration of renewable generation in the basin.

CUMULATIVE IMPACTS

See **Attachment A** at end of the section.

ENVIRONMENTAL JUSTICE

Environmental justice communities are commonly identified as those where residents are predominantly minorities or low-income; where residents have been excluded from the environmental policy setting or decision-making process; where they are subject to a disproportionate impact from one or more environmental effect or hazards; and where residents experience disparate implementation of environmental regulations, requirements, practices, and activities in their communities. Environmental justice efforts attempt to address the inequities of environmental protection in these communities.

An environmental justice analysis is composed of three parts:

1. identification of areas potentially affected by various emissions or impacts from a proposed project;

[1]Unit 3 shut down on July 22, 2013 under a prior amendment approval. Please see the **Project Description** for additional information.

2. a determination of whether there is a significant population of minority persons or persons below the poverty level living in an area potentially affected by the proposed project; and

3. a determination of whether there may be a significant adverse impact on a population of minority persons or persons below the poverty level caused by the proposed project alone, or in combination with other existing and/or planned projects in the area.

CALIFORNIA RESOURCES AGENCY

California law defines environmental justice as “the fair treatment of people of all races, cultures and income with respect to the development, adoption, implementation, and enforcement of environmental laws, regulations, and policies” (Gov. Code §65040.12; Pub. Resources Code, §72000). All departments, boards, commissions, conservancies and special programs of the Resources Agency must consider environmental justice in their decision-making process if their actions have an impact on the environment, environmental laws, or policies. Such actions that require environmental justice consideration may include:

- adopting regulations;
- enforcing environmental laws or regulations;
- making discretionary decisions or taking actions that affect the environment;
- providing funding for activities affecting the environment; and
- interacting with the public on environmental issues.

DEMOGRAPHIC SCREENING ANALYSIS

In considering environmental justice in energy facility siting cases as part of its analysis, Energy Commission staff uses demographic screening to determine whether a low-income and/or minority population exists within the potentially affected area of the proposed site. The demographic screening is based on information contained in two documents: Environmental Justice: Guidance Under the National Environmental Policy Act (Council on Environmental Quality, December, 1997) and Guidance for Incorporating Environmental Justice Concerns in U.S. Environmental Protection Agency’s Compliance Analyses (U.S. Environmental Protection Agency, April, 1998), which provides staff with information on outreach and public involvement. The Council on Environmental Quality's document defines minority individuals as members of the following groups: American Indian or Alaskan Native; Asian or Pacific Islander; Black, not of Hispanic origin; or Hispanic.

Based on the 2010 Census data and presented in **Socioeconomics Figure 1 (see the Socioeconomics section of this document)**, a minority population of 63.4 percent of the total population lives within the six-mile buffer of the ESEC site. As the minority population is greater than fifty percent, this population constitutes an environmental justice population. Staff’s demographic screening also identifies the presence of below-poverty-level populations within a six-mile buffer of the proposed project site. The

Council on Environmental Quality (CEQ) and U.S. Environmental Protection Agency (U.S. EPA) guidance documents identify a fifty percent threshold to determine whether minority populations are considered environmental justice populations but do not provide a discrete threshold for below-poverty-level populations. Using census data, staff compares the below-poverty-level populations in the six-mile buffer to other appropriate geographies. Approximately 15.8 percent or 79,776 of the population within the six-mile buffer live below the federal poverty level, which is comparable to the below-poverty-level population in the comparison geographies.

SUMMARY OF ENVIRONMENTAL CONSEQUENCES AND MITIGATION

Below is a summary of environmental consequences and mitigation proposed in this FSA.

Executive Summary - Table 1
Environmental and Engineering Assessment

Technical Area	Complies with LORS	Impacts Mitigated
Air Quality/Greenhouse gases	To be provided in FSA Part B.	
Biological Resources	Yes	Yes
Cultural Resources	Yes	Yes
Hazardous Materials	Yes	Yes
Land Use	Yes	Yes
Noise and Vibration	Yes	Yes
Public Health	Yes	Yes
Socioeconomics	Yes	Yes
Soil and Water Resources	Yes	Yes
Traffic & Transportation	Yes	Yes
Transmission Line Safety/Nuisance	Yes	Yes
Visual Resources	Yes	Yes
Waste Management	Yes	Yes
Worker Safety and Fire Protection	Yes	Yes
Facility Design	Yes	Yes
Geology & Paleontology	Yes	Yes
Power Plant Efficiency	N/A	Yes
Power Plant Reliability	N/A	Yes
Transmission System Engineering	Yes	Yes
Alternatives	N/A	N/A

AIR QUALITY/GREENHOUSE GASES

On August 24, 2014, the Final Determination for Compliance (FDOC) for this project was issued by the South Coast Air Quality Management District (SCAQMD). Since then, the project owner docketed a memo on September 24, 2014, stating that that they are seeking additional changes to the FDOC that will likely result in the SCAQMD issuing an errata. Thus, the FDOC will have changes that will likely effect staff's Air Quality Conditions of Certification.

In addition, the project owner will be seeking changes to the definition of gas turbine start up for the combustion gas turbine Units 5 and 7 (not currently covered by this amendment). The project owner anticipates filing a request to the Energy Commission in early October as a separate Petition to Amend and hopes to initiate parallel changes to Conditions of Certification **AQ-16**, **AQ-17**, **AQ-20**, and **AQ- 32** for all gas turbine units in the final decision for the ESEC project. Once this separate Petition to Amend is completed, staff will then return to this amendment and publish the Air Quality Analysis and needed supporting information in the FSA Part B. Currently, staff does not have an anticipated schedule for completing the FSA Part B. The separate Petition to Amend and all supporting documents, along with the FSA Part B, will be posted to the project docket log at:
https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=00-AFC-14C

BIOLOGICAL RESOURCES

The demolition of existing Units 3 and 4 and construction and operation of new Units 9 through 12 would result in similar impacts to biological resources as the demolition of Units 1 and 2 and the construction and operation of the existing Units 5 through 8. In addition, the ESPFM would not use ocean water for cooling, as is currently in use for the El Segundo Generating Station, Units 3 and 4. Therefore, the ESPFM would eliminate the potential for entrainment of aquatic species and the discharge of heated sea water. The ESPFM would eliminate ocean discharge of industrial and sanitary wastewater. However, stormwater would continue to be discharged through an outfall. The elimination of industrial and sanitary wastewater in outfall discharge into the Pacific Ocean required for once-through cooling and the elimination of impingement and entrainment of marine organisms and thermal discharge is a noteworthy environmental and public benefit.

Minor modifications to Conditions of Certification **BIO-6**, **BIO-7**, **BIO-8**, **BIO-9**, **BIO-10** have been proposed by staff to address that the ESPFM project and no longer include the beach turbine delivery system that was proposed, but not implemented, as part of the previous ESEC amendment, and also to align the existing conditions of certification with current standard language included in the general Biological Resources Conditions of Certification. Staff has also proposed modifying Condition of Certification **BIO-8** and adding Condition of Certification **BIO-15 (Biological Monitor Selection)** to allow for approval and use of biological monitors to act on behalf of a Designated Biologist. Staff added Condition of Certification **BIO-16 (Impact Avoidance and Minimization Measures)**, which would require exclusion measures, inspection and installation of escape ramps for open trenches. New Condition of Certification **BIO-17 (Pre-Construction Nest Surveys and Impact Avoidance and Minimization Measures for Breeding Birds)** would require a qualified biologist to monitor any bird nest locations exposed to excessive construction noise. Since the publication of the PSA, staff has determined that Conditions of Certification **BIO-11** and **BIO-13** are required due to the decommissioning of the intake/outfall structures and have included these conditions of certification in the FSA. **BIO-11** was in strikeout in the PSA since it does not apply to this project as it concerned the beach delivery system from the prior ESEC amendment.

Biology staff concludes that with implementation of proposed conditions of certification, compliance with LORS would be achieved and all direct, indirect, and cumulative impacts would be avoided, minimized, or mitigated to less than significant levels.

CULTURAL RESOURCES

Staff's analysis of ESPFM concludes that the proposed amendment would not result in impacts to known archaeological resources that meet the CEQA's definitions of historical or unique archaeological resources. As a result of ethnographic research, staff concludes that there are no ethnographic resources that will be impacted by the proposed project.

As a result of the built-environment research and investigation completed to date, staff makes a preliminary conclusion that no historic built environment resources would be impacted by the proposed project. However, results of a literature search as requested in Data Request 78, dated August 12, 2013, were provided to staff on March 5, 2014.

Staff proposes to modify the scope of Condition of Certification **CUL-6**, which requires archaeological and Native American monitoring during construction, to limit monitoring during construction to those portions of the proposed demolition and construction that would require excavation into non-fill, native soils or sediments.

HAZARDOUS MATERIALS

Staff proposes six (6) new or revised existing conditions of certification to address the safe handling of hazardous materials and site security. Staff recommends that existing Conditions of Certification **HAZ-1** and **HAZ-2** be retained but revised to reflect current nomenclature, current Energy Commission practice, and to clarify certain requirements for hazardous materials plans. Staff also recommends the deletion of existing Condition of Certification **HAZ-3** because the requirements contained therein have been incorporated into Condition of Certification **HAZ-2**. Staff instead proposes a new Condition of Certification **HAZ-3** that would require the development of a Safety Management Plan. This plan will address the delivery of all liquid hazardous materials during the demolition, construction, commissioning, and operation of the project thus further reducing the risk of any accidental release not specifically addressed by the proposed spill prevention mitigation measures, and also preventing the mixing of incompatible materials that could result in the generation of toxic vapors. New Condition of Certification **HAZ-4** addresses the use of natural gas and prohibits its use to clear pipes. Condition of Certification **HAZ-5** will require a review and update of the existing site security plan. Finally, staff proposes new Condition of Certification **HAZ-6** which would require the continued use of double-walled pipes for the transfer of 29.4 percent aqueous ammonia from the underground storage tank (UST) and portable catchment basins to collect and limit the spread of any spilled aqueous ammonia (29.4 or 19 percent) when transferring these hazardous materials from a delivery truck to a tank or tote. In this manner, no significant airborne concentration would migrate off-site to impact residents living to the south of the power plant.

LAND USE

Staff's analysis concludes that the construction and operation of the proposed ESPFM, and the effective implementation of the existing **Land Use** Conditions of Certification, would not cause significant direct, indirect, or cumulatively adverse land use impacts and would be consistent with the applicable LORS pertaining to land use. No substantive changes to the **Land Use** Conditions of Certification are proposed. Staff proposes removing **LAND USE-12**, **13**, and **14** because they are no longer applicable to the project. These conditions were added when a previous amendment considered beach delivery of heavy equipment and supplies. The current amendment does not propose a beach delivery of heavy equipment and supplies, thus these conditions are no longer relevant.

NOISE AND VIBRATION

Staff determined that the demolition and removal of Units 3 and 4 and the installation and operation of new Units 9 through 12 would result in similar grading, excavation, foundation, and underground infrastructure activities as were required for the demolition of Units 1 and 2 and the construction of Units 5 through 7 under the original Energy Commission Decision (CEC 2005a). Thus, the ESPFM demolition, construction, and operations does not alter the assumptions and conclusions in the original Decision and no additional or revised LORS requirements have been identified since the original Decision. Staff does not propose any changes to the existing Conditions of Certification **NOISE-1** through **NOISE-10** established by the 2005 Decision.

PUBLIC HEALTH

Staff has established that the toxic emission increment from the ESPFM would not lead to significant cancer and non-cancer impacts in the project area. Since the related cancer and non-cancer risk estimates are below staff's significance levels and reflect the efficiency of the applicant's proposed emission controls, staff does not recommend changes to the existing conditions of certification.

SOCIOECONOMICS

Staff concludes that construction and operation of the ESPFM would not cause significant direct, indirect, or cumulative socioeconomic impacts on the project area's population, housing, schools, law enforcement, or parks and recreation. Staff also concludes that the project would not induce a substantial population growth or displacement of population, or induce substantial increases in demand for housing, parks, or law enforcement services. Because the project would have no significant adverse socioeconomic impacts, the project would have no socioeconomic impact on the environmental justice population (as defined in the **Socioeconomics** section in this FSA).

Staff is proposing changes to Condition of Certification **SOCIO-1** and a new Condition of Certification **SOCIO-3**, that would ensure project compliance with state and local LORS as they relate to development impacts and school fees.

SOIL & WATER RESOURCES

ESPFM would eliminate once-through-cooling (OTC) by using dry-cooling. Air cooled condensers would be used to cool the steam cycle. The project would use recycled water exclusively for industrial operation and the use of a Zero-Liquid-Discharge system to reuse water and reduce wastewater volume. The proposed project would result in a 200 million gallon per day (mgd) reduction in intake and wastewater volume to the Pacific Ocean.

Staff believes the proposed project's water use is consistent with Energy Commission water policy and that the modified project would in compliance with State Water Resources Control Board's (SWRCB) Resolution No. 2010-0020 and the OTC Plan that requires all coastal power plants that utilize OTC to meet new performance requirements through a reduction in intake volume and velocity. Staff has proposed that tertiary treated recycled water be used for construction purposes including dust suppression, concrete mixing, hydrostatic testing, and compaction. The **Soil and Water Resources** Conditions of Certification have been updated and revised to reflect current project design.

TRAFFIC & TRANSPORTATION

Staff concludes that the addition of Conditions of Certification **TRANS-8** and **TRANS-9** to the existing **Traffic and Transportation** Conditions of Certification will reduce traffic related impacts related to the project to a less than significant level. Condition of Certification **TRANS-8** would require the project owner to advise pilots of the potential aviation hazards associated with thermal plumes and to avoid overflight of the facility below 2,020 feet. Condition of Certification **TRANS-9** would require the project owner to install obstruction marking and lighting on all construction equipment which may pose an aviation hazard during project construction.

TRANSMISSION LINE SAFETY AND NUISANCE

Since no new transmission towers or lines would need to be constructed or replaced within or outside of the site boundaries, staff determined that the only changes to line impacts would be those from the additional 449 MW to be introduced into the existing transmission system. Staff recommends Condition of Certification **TLSN-4** to measure the incremental impacts of increased electric and magnetic fields for comparison with existing levels at the ESEC project. Staff determined that the existing electric and magnetic levels are below the levels of health and safety concern.

VISUAL RESOURCES

Staff proposes minor additions to Condition of Certification **VIS-2** to address landscape plant survival issues encountered with recent landscape planting under the existing conditions. Additions to Condition of Certification **VIS-6** were made to address night lighting effects of the newly proposed administration building. New condition of Certification **VIS-10** was added to address use of the highly visible former tank farm site as an on-site construction laydown area.

Since the publication of the PSA, the project owner proposed changes in wording to Conditions of Certification **VIS-2** and **VIS-10**, referencing on-going implementation of previously approved conditions as applied under the 2010 Commission Decision. The proposed changes would not alter the meaning or requirements of the conditions in any way, so the proposed changes have been included into these conditions.

Staff concludes that the ESPFM would result in less than significant impacts to existing scenic resources within the project viewshed because of the already degraded condition of the site and viewshed. Conditions of Certification VIS-1 though VIS-10 comprise a collection of feasible visual mitigation and enhancement measures to rehabilitate the degraded visual condition of the ESGS site. While the visual degradation of the coastal zone has not been completely eliminated and restored, substantial improvements have or will be made, and identified feasible measures have been applied. Staff also concludes that the ESPFM, with all recommended Conditions of Certification as modified, would be consistent with applicable LORS, including visual enhancement goals and policies of the California Coastal Act, and of the city of El Segundo.

WASTE MANAGEMENT

Staff proposes modifications to Condition of Certification **WASTE-8** to reflect SCAQMD's reporting requirements for the disposal of asbestos-containing materials in the Los Angeles air basin. Staff has added Condition of Certification **WASTE-9** to mitigate any potential impact from the demolition of Units 3 and 4.

There are a number of Recognized Environmental Conditions (RECs) located on the ESEC project parcel where the ESPFM will be constructed. The project owner has established programs in place to address, develop and implement remediation strategies, and worker safety standards that would mitigate these conditions and protect the environment and ESEC personnel.

With staff's proposed changes to the existing conditions of certification and the project owner's established programs as discussed above, staff finds that the ESPFM would not result in any significant adverse impacts and would comply with applicable waste management laws, ordinances, regulations and standards, if the measures proposed in the staff's analysis are implemented.

WORKER SAFETY AND FIRE PROTECTION

For **Worker Safety and Fire Protection**, staff is not proposing new conditions of certification for the modified project. Staff finds that the existing **Worker Safety and Fire Protection** Conditions of Certification with minimal revisions to reflect current nomenclature, current Energy Commission practice, and to clarify requirements during demolition activities would be sufficient to ensure compliance with all LORS. Staff concludes that with the continued implementation of the currently-required six (6) mitigation measures, worker safety and fire protection at the modified project site would not present a significant risk to on-site workers. These conditions would ensure that the most modern fire prevention, detection, and suppressions systems are installed and implemented. With adoption of the proposed conditions of certification, the ESPFM will

comply with all applicable LORS and will not result in any unmitigated significant adverse impacts.

FACILITY DESIGN

Staff concludes that the design, construction, and eventual closure of the modified ESEC and its linear facilities would likely comply with applicable engineering laws, ordinances, regulations and standards. The proposed conditions of certification would ensure compliance with these laws, ordinances, regulations and standards.

GEOLOGY AND PALEONTOLOGY

Staff found that the demolition, construction, and operation of the ESPFM would not result in any significant adverse impacts to paleontological, geological or mineralogical resources; would not be subject to immitigable geologic hazards; and would comply with applicable LORS if the measures proposed in the staff's analysis are implemented. The implementation of the current conditions of certification, including proposed modification to Condition of Certification **PAL-7**, and the addition of Condition of Certification **PAL-8** for the ESPFM will continue to mitigate impacts to below significance for the decommissioning and demolition of El Segundo Generating Station (ESGS) Units 3 and 4, and the construction and operation of ESPFM Units 9, 10, 11, and 12. Condition of Certification **PAL-7** was modified to clarify the responsibility of the Paleontological Resource Specialist (PRS) to describe the sensitivity and significance of discovered paleontological resources in the PRR required in **PAL-7**. Proposed Condition of Certification **PAL-8** has been added to assure that the components described in the Paleontological Resources Monitoring and Mitigation Plan (PRMMP), (required in **PAL-3**) are adequately performed.

While valuable paleontological resources are expected to be discovered during construction of the proposed project, potential impacts to paleontological resources due to construction activities would be mitigated through worker training and monitoring by qualified paleontologists, as required by proposed Conditions of Certification **PAL-1** through **PAL-8**.

POWER PLANT EFFICIENCY

Staff finds that while the ESPFM would consume substantial amounts of energy, it would do so in the most efficient manner practicable. It would not create significant adverse effects on energy supplies or resources, would not require additional sources of energy supply, and would not consume energy in a wasteful or inefficient manner. No energy standards apply to this project. Staff therefore concludes that this project would create no significant adverse impacts on energy resources. No cumulative impacts on energy resources are likely. Facility closure would not likely present significant impacts on electric system efficiency. No conditions of certification are proposed for **Power Plant Efficiency**.

POWER PLANT RELIABILITY

The project owner's predictions of 60 percent capacity factor for Units 9-10 and 55 percent for Units 11 and 12 yield equivalent availability factors of 94 percent and 89 percent, respectively, which staff believes are achievable. Based on a review of the proposal, staff concludes that the plant would be built and operated in a manner consistent with industry norms for reliable operation. No conditions of certification are proposed for **Power Plant Reliability**.

TRANSMISSION SYSTEM ENGINEERING

Staff concluded that the ESPFM would not impact the previously approved 230kV plant switchyard, outlet lines, and termination facilities. The certified facilities are adequate and in accordance with industry standards and good utility practices and are acceptable to staff according to engineering laws, ordinances, regulations and standards.

ALTERNATIVES

This section evaluates a reasonable range of alternatives to the proposed ESPFM. Staff has not identified a feasible alternative that would be environmentally superior to the proposed ESPFM, including the "no project" alternative. The range of alternatives considered by staff in addition to the "no project" alternative includes alternative site locations, alternative site configurations, and alternative technologies. Each of these alternatives have been eliminated from detailed consideration due to a failure to meet most of the basic project objectives, infeasibility, inability to avoid significant environmental impacts, or any combination thereof.

REFERENCES

CEC 2005a – CEC (CEC-800-2005-001-CMF). El Segundo Power Redevelopment Project Commission Decision, dated February 2005.

NRG 2013a—NRG/El Segundo Energy Center, L.L.C. (tn 70442). Petition to Amend, dated April, 2013, submitted to the California Energy Commission on April 23, 2013.

EXECUTIVE SUMMARY ATTACHMENT A

CUMULATIVE IMPACTS

Preparation of a cumulative impact analysis is required under CEQA. In the CEQA Guidelines, “a cumulative impact consists of an impact which is created as a result of the combination of the project evaluated in the EIR together with other projects causing related impacts” (14 Cal. Code Regs., §15130(a)(1)). Cumulative impacts must be addressed if the incremental effect of a project, combined with the effects of other projects is “cumulatively considerable” (14 Cal. Code Regs, §15130(a)). Such incremental effects are to be “viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects” (14 Cal. Code Regs., §15164(b)(1)). Together, these projects comprise the cumulative scenario which forms the basis of the cumulative impact analysis.

CEQA also states that both the severity of impacts and the likelihood of their occurrence are to be reflected in the discussion, “but the discussion need not provide as great detail as is provided for the effects attributable to the project alone. The discussion of cumulative impacts shall be guided by standards of practicality and reasonableness, and shall focus on the cumulative impact to which the identified other projects contribute rather than the attributes of other projects which do not contribute to the cumulative impact” (14 Cal. Code Regs., §15130(b)).

DEFINITION OF THE CUMULATIVE PROJECT SCENARIO

Cumulative impacts analysis is intended to identify past, present, and probable future actions that are closely related either in time or location to the project being considered, and consider how they have harmed or may harm the environment. Most of the projects listed in the cumulative projects tables (**Executive Summary Tables 1)** and corresponding figure (**Executive Summary Figure 1**) have, are, or will be required to undergo their own independent environmental reviews under CEQA.

Under CEQA, there are two acceptable and commonly used methodologies for establishing the cumulative impact setting or scenario: the “list approach” and the “projections approach.” The first approach would use a “list of past, present, and probable future projects producing related or cumulative impacts.” (14 Cal. Code Regs., §15130(b)(1)(A)). The second approach is to use a “summary of projections contained in an adopted general plan or related planning document, or in a prior environmental document which has been adopted or certified, which described or evaluated regional or area wide conditions contributing to the cumulative impact.” (14 Cal. Code Regs., §15130(b)(1)(B)). This PSA uses the “list approach” for purposes of state law to provide a tangible understanding and context for analyzing the potential cumulative effects of the proposed project.

In order to provide a basis for cumulative analysis for each discipline, this section provides information on other projects in both maps and tables. All projects used in the Cumulative Impacts Analysis for this PSA are provided in cumulative projects tables.

Executive Summary Figure 1, presented at the end of this section, shows projects within 50 miles of the ESEC site. However, within the desert region, the specific area of cumulative effect varies by resource. For this reason, each discipline has identified the geographic scope for the discipline's analysis of cumulative impacts, which may exceed the 50-mile buffer shown in **Figure 1**.

APPROACH TO CUMULATIVE IMPACT ANALYSIS

This PSA evaluates cumulative impacts within the analysis of each resource area, following these steps:

- Define the geographic scope of cumulative impact analysis for each discipline, based on the potential area within which impacts of the ESEC could combine with those of other projects.
- Evaluate the effects of the ESEC in combination with past and present (existing) projects within the area of geographic effect defined for each discipline.
- Evaluate the effects of the ESEC with foreseeable future projects that occur within the area of geographic effect defined for each discipline. This section is divided into Foreseeable Future Projects and Foreseeable Renewable Projects in the California Desert for ease of the reader.

Executive Summary Figure 1A
Blythe Solar Power Project – Cumulative Impacts (Projects within the map view)

Projects referenced with a POINT					
Label ID	Status	Project Name	Project Description	Location	Distance (Miles)
1	**Completed/ Past**	El Segundo	Redevelopment of power plant Units 1 and 2.	301 Vista Del Mar, El Segundo	0.19
2	**Completed/ Past**	Chevron Coke Drum Project	Removal of six existing coke drums and installation of six new coke drums with the same capacity and location in the Delayed Coker Unit.	324 West El Segundo Blvd., El Segundo	0.49
3	**Planned/ Present**	EA-974	Central Reliability Center, central tool room. New: 101,000 sq. ft.; existing to remain: 13,000 sq. ft.; new total is 114,000 sq. ft.	324 West El Segundo Blvd., El Segundo	0.58
4	**Foreseeable**	Scattergood Generating Station	The Los Angeles Dept. of Water and Power would construct four power-generating units at the Scattergood Generating Station. Some structures would be demolished and two full size units on the lower level and two smaller units on the middle level of the plant would be constructed. The project work force will utilize on-site parking.	12700 Vista Del Mar, Los Angeles	0.72
5	**Planned/ Present**	EA-1020	New 5,127 sq. ft. office/research and development building	138 Eucalyptus Dr., El Segundo	0.85
6	**Planned/ Present**	EA-961	386 sq. ft. office and 3019 sq. ft. warehouse	130 Arena St., El Segundo	0.90
7	**Planned/ Present**	EA-1004	Two new creative office and research and development buildings. 1,297 sq. ft. office, 7,803 sq. ft. research and development, 1,194 sq. ft. warehouse, total 10,294 sq. ft.	134 Penn St., El Segundo	1.00
8	**Planned/ Present**	EA-1003	Two new creative office and research and development buildings. 1,297 sq. ft. office, 7,803 sq. ft. research and development, 1,194 sq. ft. warehouse, total 10,294 sq. ft	130 Penn St., El Segundo	1.01
9	**Planned/ Present**	EA-781	7-Unit Residential Condominium, 14,313 sq. ft.	301,303,305 Palm Ave., El Segundo	1.20
10	**Foreseeable**	EA-1038	4-unit condominium (6,963 sq. ft.), 2 stories, semi-subterranean parking.	711 Main St. El	1.25

Projects referenced with a POINT					
Label ID	Status	Project Name	Project Description	Location	Distance (Miles)
				Segundo	
11	**Planned/ Present**	EA-1014	2-lot subdivision for two 6-unit multi-family residential condos (12 total units)	115 East Walnut Ave., El Segundo	1.52
12	**Planned/ Present**	EA-959	Two office buildings; 30,660 sq. ft.	222 Kansas St. El Segundo	1.54
13	**Foreseeable**	EA-993, The Point	119,275 sq. ft. total. Shopping center (71,343 sq. ft.), restaurant (25,627 sq. ft.), and office (27,338 sq. ft.).	820-850 S. Sepulveda Blvd., El Segundo	1.60
14	**Foreseeable**	Civic Center/Metlox Development	Demolition and reconstruction of the existing police and fire department facilities to include a two-level (one level below grade), approx. 57,000 sq. ft. combined police and fire dept. public safety facility. The existing public library would be reconstructed by either adding on to the existing 12,100 sq. ft. public library or demolished and reconstructed with a new public library and cultural arts center for an approx. 40,000 sq. ft. structure with roughly 30,000 sq. ft. for library space and 10,000 sq. ft. for a 99-seat cultural arts center. The Metlox project consists of a mixed-use commercial development with subterranean parking, incl. some above-grade surface parking on the proposed 13th Street extension. The total floor area proposed is approx. 90,000 sq. ft. comprised of retail, restaurant, a 40-room bed and breakfast lodging component, and office uses.	Site boundaries: 15th St. on north, Valley Dr. on east, Manhattan Beach Blvd. on south, and Highland Ave. and Morningside Dr. on west; Manhattan Beach	1.67
15	**Planned**	EA-890, El Segundo Unified School District	304 Senior housing/assisted living facility up to 175,000 sq. ft.	540 E. Imperial Ave., El Segundo	1.72
16	**Planned**	EA-958	9 residential condo units	1700 E Mariposa Ave., El Segundo	1.79
17	**Foreseeable**	Manhattan Village Shopping Center	A net increase of approx. 123,672 sq. ft. restaurant and retail (approx. 194,644 sq. ft. new area and demolition of approx. 70,972 sq. ft. existing retail, restaurant, and cinema) to be developed within three components. The shopping center would include a total of approx. 696,509 sq. ft. An “equivalency program”	3200-3600 North Sepulveda Blvd., Manhattan Beach	1.81

Executive Summary Figure 1A
Blythe Solar Power Project – Cumulative Impacts (Projects within the map view)

Projects referenced with a POINT					
Label ID	Status	Project Name	Project Description	Location	Distance (Miles)
		Enhancement Project	is proposed that provides for the exchange between land uses based on P.M. peak traffic equivalency factors. A max. of 133,389 sq. ft. net new area (approx. 204,361 sq. ft. new area and demolition of approx. 70,972 sq. ft. existing retail, restaurant, and cinema) would be developed for a total of up to 706,226 sq. ft.. Approx, 544 parking spaces would be provided in surface parking areas and within multiple parking structures.		
18	**Planned**	EA-912	New 3,714 sq. ft. restaurant with drive through; parking and landscaping redesign; outdoor dining	600 - 630 North Sepulveda Blvd., El Segundo	1.93
19	**Planned**	Cambria Suites, EA-844	152 room hotel – 71,000 sq. ft.	199 Continental Blvd., El Segundo	1.99
20	**Foreseeable**	EA-905, Raytheon Campus Specific Plan	Approx. 2.1 million (2,142,457) square-foot Office Park Expansion (office, retail, warehouse, light industrial).	2100 El Segundo Boulevard, El Segundo	2.00
21	**Foreseeable**	EA-986, Mattel	R&D and office, 14 stories, 300,000 sq. ft., 810-space parking structure-8-stories	455 Continental Blvd. and 19055 E. Grand Ave., El Segundo	2.00
22	**Planned/ Present**	EA-981	Office, 194,119 sq. ft.	1700 East Imperial Ave., El Segundo	2.07
23	**Foreseeable**	EA-997, Hotel	5-story, 190 room hotel, 107,090 sq. ft.	888 North Sepulveda, El Segundo	2.13
24	**Planned/ Present**	EA-996	2800 sq. ft. convenience store	2161 E. El Segundo Blvd. El Segundo	2.13
25	**Planned/**	Central Utility Plant	Replace the 50-year old existing Central Utility Plant (CUP) with a more modern	LAX, Los Angeles	2.22

Projects referenced with a POINT					
Label ID	Status	Project Name	Project Description	Location	Distance (Miles)
	Present	Replacement	and energy efficient facility		
	Planned/ Present	New Tom Bradley International Terminal	18 new gates to the west side of the Tom Bradley International Terminal, great hall for dining and retail shopping.		
	Planned/ Present	Elevator, Escalator, and Moving Walkway Modernization	Refurbish 212 outdated systems with new, modern units throughout the airport; new escalators, elevators, and walkways		
	Planned/ Present	Terminal 5 Renovation	Completed new in-line baggage screening system, expansion of passenger screening check points, and international passenger processing facilities. Renovate baggage claim areas, ticketing/check-in lobby, boarding gates, and other parts of passenger security screening area. Replace 13 bridges.		
	Planned/ Present	LAX Curbside Appeal Project	Phase 1: New Canopy, landscaping, light band, and new light poles in front of Tom Bradley International Terminal; Phase 2: Light band, light poles, and canopies in front of the terminal in the LAX Central Terminal Area		
	Planned/ Present	Runway Status Lights	With completion of the installation of the prototype runway status lights in 2009, the full system will be installed. Runway status lights use a series of red lights embedded in the pavement to warn pilots if it is unsafe to cross or enter a runway, or to take off.		
26	**Planned/ Present**	EA-971	Data Center, addition of 75,435 sq. ft., demo of 11,769 sq. ft. out of existing for new total sq. ft. of 180,422.	444 N Nash St., El Segundo	2.33
27	**Foreseeable**	West Aircraft Maintenance Area	Replace existing facilities and consolidate maintenance operations; paved area for aircraft parking, maintenance hangars, 300-space employee parking lot, storage, equipment related facilities, and ground run-up enclosure.	LAX, Los Angeles	2.35
	Foreseeable	Midfield Satellite	Phase 1 of the MSC Program (northern portion of the MSC facility and		

Executive Summary Figure 1A
Blythe Solar Power Project – Cumulative Impacts (Projects within the map view)

Projects referenced with a POINT					
Label ID	Status	Project Name	Project Description	Location	Distance (Miles)
		Concourse North	associated improvements). Project components include a concourse for up to 11 gates and assoc. facilities; improvements to taxiways and taxilanes; ramp tower or FAA supplemental airport traffic control tower; and utilities to support the North MSC facility.		
	Foreseeable	LAX Runway 7L/25R Runway Safety Area (RSA) Project & Associated Improvements	1) Extend Runway 7L/25R pavement; grade and compact the RSA; construct blast pad west of Runway 7L extension; several taxiways modifications as necessary; relocate existing Localizer Antenna and shelter to the west; replace existing Approach Lighting System (ALS) towers with in-pavement lights; and modify existing Runway and Taxiway lighting and markings in newly constructed pavements; 2) Reconstruct pavement of eastern portions of Runway 7L/25R and Taxiway B including connecting taxiways and installation of in-pavement approach lights; 3) Reconstruct pavement of aircraft parking apron west of Air Freight Building No. 8, including new markings.		
	Foreseeable	LAX Runway 6L-24R Safety Area & Associated Improvements	Improve Runway 6L-24R and service roads to bring runway into compliance with applicable FAA design criteria.		
28	**Planned/ Present**	Wiseburn High School	New high school, 180,000 to 240,000 sq. ft.	201 North Douglas, El Segundo	2.37
29	**Foreseeable**	EA-1021	625,205 sq. ft. total; 611,545 sq. ft. office, 12,660 sq. ft. retail	710 North Nash St., El Segundo	2.38
30	**Foreseeable**	EA-1040	28,406 sq. ft. office, 33,475 sq. ft. light industrial, total 61,881 sq. ft.	400 Duley Rd. El Segundo	2.45
31	**Planned/ Present**	EA-784	Data Center, 332,137 sq. ft.	445 N Douglas Street, El Segundo	2.45
32	**Planned/ Present**	EA-1001	Creative office. 2355 Utah: Convert existing 42,548 sq. ft. to all office, add 1687 sq. ft. 2383 Utah: Convert existing 152,506 sq. ft. to all office, add 6850 sq. ft.	2355 Utah and 2383 Utah Ave., El	2.53

Projects referenced with a POINT					
Label ID	Status	Project Name	Project Description	Location	Distance (Miles)
				Segundo	
33	**Planned/ Present**	Marine Avenue Hotels project	Two hotels- Hyatt Place and Residence Inn by Marriott. Total between both hotels: 310 guest rooms and 35,000 sq. ft. of related meeting space with recreational vehicle parking and storage area. Hyatt Place is 92,672 sq. ft. with 155 rooms, restaurant, lounge, 1,500+ sq. ft. meeting space, outdoor pool and whirlpool, exercise room, business center, sundry shop and guest laundry. Four stories with max building height of approx. 61 feet. Residence Inn by Marriott is 116,146 sq. ft. with 154 rooms, breakfast dining area, 1,325+ sq. ft. meeting space, outdoor pool and whirlpool, exercise room, outdoor sport court, picnic area with grill, business center, sundry shop and guest laundry. Four stories with max building height of approx. 52 ft.	2410 Marine Ave. and 2420 Marine Ave., Redondo Beach	3.25
34	**Foreseeable**	E&B Natural Resources Oil Development Project	Proposed onshore drilling and production site using directional drilling of 30 wells to access the oil and gas reserves in the tidelands (granted by the State of California to the City) and in an onshore area known as the uplands. Both of these areas are located within the Torrance Oil Field beneath the City. Relocate the city maintenance yard to another site and installation of offsite underground pipelines for the transport of the processed crude oil and gas from the project site to purchasers. 30 oil wells, four water injection wells, and supporting production equipment.	555 6th Street, Hermosa Beach	3.59
35	**Foreseeable**	Redondo Beach Energy Project	Natural gas fired air-cooled 496-megawatt electrical generating facility. Project would require demolition of existing power plant and construction of project.	Redondo Beach Generating Station site, Redondo Beach	4.30
36	**Planned/ Present**	Greenstreet Project	20,000- sq. ft. commercial development	901 N. Catalina Ave., Redondo Beach	4.40
37	**Planned/ Present**	Shade Hotel	Hotel with 54 rooms, conference space for up to 60 people, event/wedding space for up to 150 people, a rooftop Skydeck pool area and its own Zinc@Shade lounge featuring breakfast, lunch and dinner.	655 N. Harbor Drive, Redondo Beach	4.50

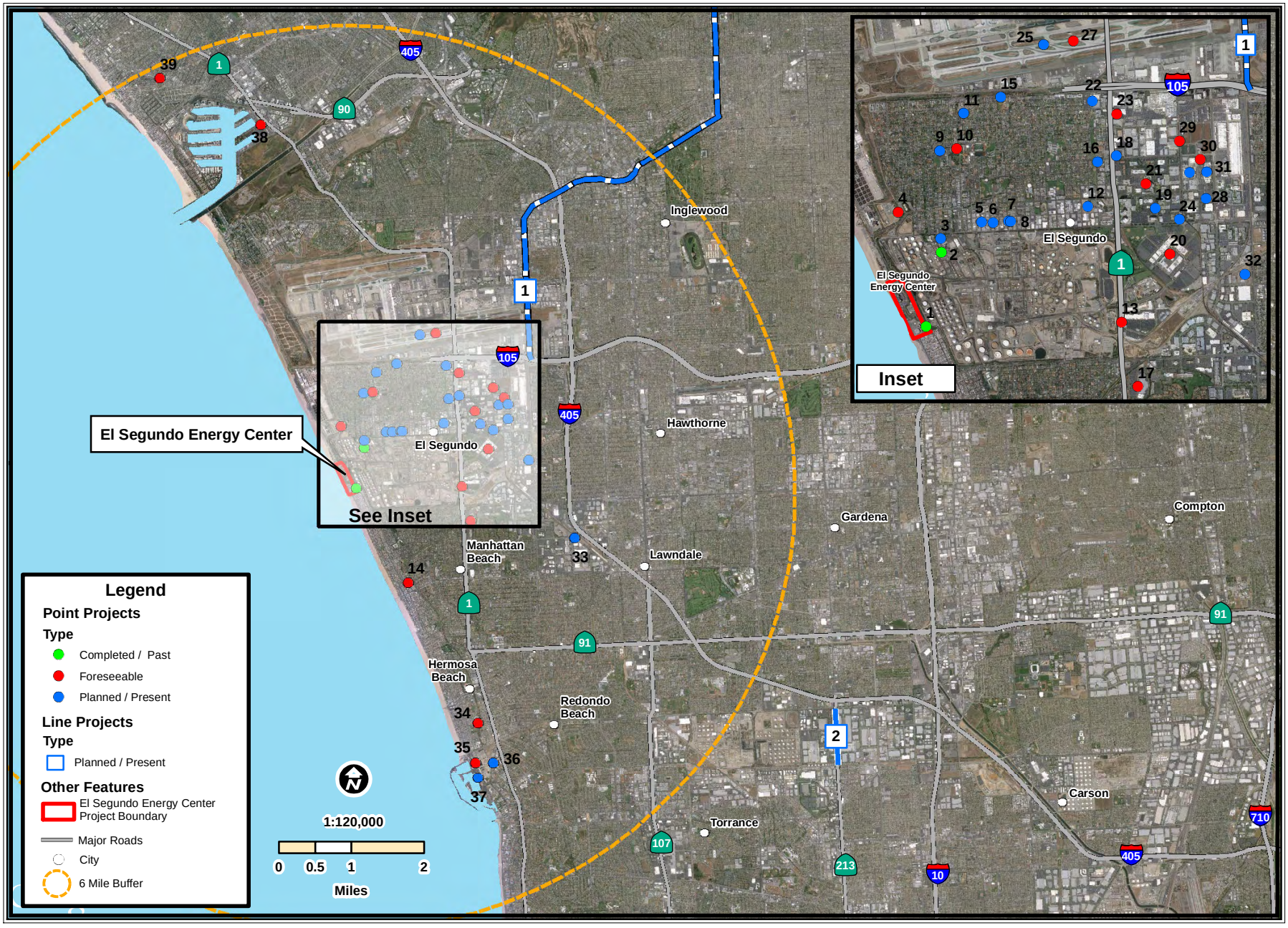
Executive Summary Figure 1A
Blythe Solar Power Project – Cumulative Impacts (Projects within the map view)

Projects referenced with a POINT					
Label ID	Status	Project Name	Project Description	Location	Distance (Miles)
38	**Foreseeable**	Parcel 44 Development	Demolition of all existing landside structures on Parcel 44 and redevelopment that includes 83,778 sq. ft. of commercial, office, retail, restaurant and boater-serving uses. An open-air boat stacking/rack system allowing outdoor storage of up to 44 boats stacked three-boats-high, along with 13 "mast-up"/small sailboat storage spaces adjacent to the yacht club/boat repair building. Proposed parking includes 479 on-grade parking spaces (284 standard-dimensioned spaces, 11 accessible spaces, and 184 compact parking spaces) with 70 of the parking spaces in tandem configuration. The project also proposes 74 bicycle parking spaces	Mindanao Way and Admiralty Way, Marina Del Rey	5.02
39	**Foreseeable**	ENV-2013-2713-MND	Legalize the change in use of a 1,013 sq. ft. office and a 553 sq. ft. take-out restaurant into 1,566 sq. ft. restaurant with the expansion of an existing 1,390 sq. ft. sit-down restaurant, resulting in a 2,956 sq. ft. sit-down restaurant with seating for 74 patrons.	1635 S. Abbot Kinney Boulevard, Los Angeles	6.08

Projects referenced with a LINE					
Label ID	Status	Project Name	Project Description	Location	Distance (Miles)
1	**Planned/ Present**	Crenshaw/LAX Transit Corridor Project	An 8.5-mile light-rail line between existing Metro Exposition Line at Crenshaw & Exposition Blvds. to Metro Green Line's Aviation/LAX Station. Includes eight stations, a maintenance facility, park-ride lots, traction power substations and acquisition of rail vehicles and maintenance equipment.	Crenshaw Corridor, Inglewood, Westchester, and LAX area	2.97
2	**Planned/ Present**	Western Ave. and Rolling Hills Rd. Water Main Replacement Project	Replace approx. 5,000 linear ft. of 12-inch diameter cast iron pipe with new 12-inch diameter ductile iron pipe (DIP) along Western Ave. Replace approx. 700 linear ft. of 8-inch diameter cast iron pipe in Rolling Hills Rd. with new 8-inch diameter DIP. The Recycled Water Retrofits for Anza Avenue Medians and Parks Project will substitute potable water for irrigation of medians and parks with recycled water, replacing existing potable water meters and new pipes. Retrofit Victor Park, Seaside Heroes Park, Paradise Park, and La Paloma Park.	Western Ave. between Del Amo Blvd. and 190th St. to the north, Torrance	7.21

CUMULATIVE IMPACTS - FIGURE 1

El Segundo Energy Center - Cumulative Impacts



CULIMATIVE IMPACTS

CALIFORNIA ENERGY COMMISSION, SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCE:Google Aerial Imagery

INTRODUCTION

Christine Stora

On April 23, 2013, El Segundo Energy Center, LLC (ESEC LLC) filed a petition with the California Energy Commission (Energy Commission) requesting to demolish and replace utility boiler Units 3 and 4 with one new combined cycle generator (Unit 9), one steam turbine generator (Unit 10) using dry cooling, and two simple-cycle gas turbines (Units 11 and 12), for the El Segundo Energy Center (ESEC) project. This amendment, also known as the El Segundo Power Facility Modification (ESPFM) or the ESEC amendment, would result in a total generating capacity of 1,022 megawatt gross. (Units 5, 6, 7, 8, 9, 10, 11 and 12).

The site is located at the southernmost city limit of the city of El Segundo on the coast of the Pacific Ocean, between Dockweiler State Beach and the city of Manhattan Beach, in Los Angeles County.

AMENDMENT PROCESS

The purpose of the Energy Commission's review process is to assess the impacts of the proposed ESPFM on environmental quality and public health and safety. The Energy Commission will evaluate the impacts caused by the proposed changes to the existing ESEC site. The review process will determine if the proposed modification would remain in compliance with applicable laws, ordinances, regulations, and standards (LORS) (Title 20, Calif. Code of Regulations, section 1769).

The Energy Commission Committee assigned to this petition to amend, has determined that this amendment will follow the siting review process in order to afford agencies, interested parties, intervenors, and the public, the greatest opportunity for participation and review of the proposed project.

PURPOSE OF THIS REPORT

This Final Staff Assessment (FSA) is being published by the Energy Commission and is staff's independent analysis of the petition to amend the ESEC. This FSA is staff's final recommendation to the committee. It is neither a Committee document, nor a draft Decision. The FSA describes the following:

- the proposed modified project (ESPFM);
- the updated existing environment from the existing site;
- whether the modified facilities can be constructed and operated safely and reliably in accordance with applicable LORS;
- the potential cumulative impacts of the modified project in conjunction with other existing and known planned developments;

- modified and/or new conditions of certification proposed by the project owner, staff, interested agencies, local organizations, tribes, and intervenors which may lessen or eliminate potential impacts of the modified project; and

- project alternatives.

The analyses contained in this FSA are based upon information from the: 1) Petition to Amend (PTA) and Supplements to the PTA provided by the project owner; 2) responses to Energy Commission staff data requests; 3) supplementary information from local, state, and federal agencies, interested organizations and individuals; 4) existing documents and publications including the record from the approved ESEC and the ESEC Preliminary Staff Assessment (PSA) published for this amendment; 5) independent research; 6) comments at public workshops and written comments received on the PSA; and 7) other docketed communications. The analyses for most technical areas include discussions of proposed modifications to conditions of certification and new, additional, conditions of certification. Each condition of certification is followed by a proposed means of "verification." All changes to conditions of certification in the original decision are shown in this document so the reader can easily identify the changes being made to the project license. Deleted text to the conditions of certification is shown as ~~strikethrough~~, new text is **bold and underlined**.

The FSA presents staff's final conclusions about potential environmental impacts and conformity with LORS of the ESPFM project, as well as modified and/or new conditions that apply to the design, construction, operation and closure of the facility.

This document is intended to be a complete review of the ESPFM project and in many cases relies on analysis that was prepared during the licensing process for the existing ESEC project as baseline information. This information has been reviewed and updated to reflect current conditions and the setting that exists today. Although this document provides a full analysis of the project as a whole, this petition will be processed as an amendment to the ESEC Final Decision for the site.

ORGANIZATION OF THE FINAL STAFF ASSESSMENT

The sections in this FSA include an Executive Summary, Introduction, Project Description, and a Project Analysis. The Project Analysis contains an Environmental Assessment, Engineering Assessment, Alternatives and Compliance Conditions of Certification. The Environmental Assessment contains the following chapters: 1) Air Quality (to be published in FSA Part B, for more information please see the **Executive Summary** of this document); 2) Biological Resources; 3) Cultural Resources; 4) Hazardous Materials Management; 5) Land Use; 6) Noise and Vibration; 7) Public Health, Socioeconomic Resources; 8) Soil and Water Resources; 9) Traffic and Transportation; 10) Transmission Line Safety and Nuisance; 11) Visual Resources; 12) Waste Management; and 13) Worker Safety and Fire Protection. The Engineering Assessment contains the following sections: 14) Facility Design; 15) Geology and Paleontology; 16) Power Plant Efficiency; 17) Power Plant Reliability; and 18) Transmission System Engineering. The Environmental Assessment, Engineering

Assessment, and Compliance Conditions of Certification are followed by a discussion of facility closure, project construction and operation, compliance monitoring plans, and a list of staff that assisted in preparing this report.

All of the sections under the Environmental Assessment, Engineering Assessment, and the Compliance Conditions of Certification include a discussion of: LORS; the regional and site-specific setting; the modified projects' specific and cumulative impacts; proposed mitigation measures; conclusions and recommendations; and modified and/or new conditions of certification for both construction and operation (if applicable).

ENERGY COMMISSION REVIEW PROCESS

The California Energy Commission has the exclusive authority to certify the construction and operation of thermal electric power plants 50 megawatts (MW) or larger. The Energy Commission certification is in lieu of any permit required by state, regional, or local agencies, and federal agencies to the extent permitted by federal law (Pub. Resources Code, §25500). The Energy Commission must review power plant applications for certification (AFCs) to assess potential environmental and public health and safety impacts, potential measures to mitigate those impacts (Pub. Resources Code, §25519), and compliance with applicable governmental laws and standards (Pub. Resources Code, §25523 (d)).

The Energy Commission's regulations require staff to independently review the PTA and assess whether the list of environmental impacts it contains is complete, and whether additional or more effective mitigation measures are necessary, feasible and available (Cal. Code Regs., tit. 20, §§ 1742 and 1742.5(a)). Staff's independent review is presented in this report (Cal. Code Regs., tit. 20, §1742.5). In addition, staff must assess the completeness and adequacy of the health and safety standards, and the reliability of power plant operations (Cal. Code Regs., tit. 20, § 1743(b)). Staff is required to coordinate with other agencies to ensure that applicable LORS 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 (CEQA). No Environmental Impact Report (EIR) is required because the Energy Commission's site certification program has been certified by the Secretary of the Natural Resources Agency (Pub. Resources Code, §21080.5 and Cal. Code Regs., tit. 14, §15251 (k)). The Energy Commission is the CEQA lead agency and is subject to all portions of CEQA applicable to certified regulatory activities.

The staff prepares an FSA that presents for the petitioner, intervenors, organizations, agencies, other interested parties, and members of the public, the staff's analysis, conclusions, and recommendations. Where it is appropriate, the FSA incorporates comments received from agencies, the public, and parties to the siting case and comments made at the workshops.

The FSA is only one piece of evidence that will be considered by the Committee (two Energy Commission 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 ESPFM project. At the public evidentiary hearing, all parties will be afforded an opportunity to present evidence, thereby creating a hearing record on which a final decision on the project can be based. The hearing before the Committee also allows all parties to argue their positions on disputed matters, if any, and it provides a forum for the Committee to receive comments from the public and other governmental agencies.

Following the hearing, the Committee's recommendation to the full Energy Commission on whether or not to approve the ESPFM project will be contained in a document entitled the Presiding Member's Proposed Decision (PMPD). Once published, the PMPD is circulated in order to receive written public comments. At the conclusion of the comment period, the Committee will determine whether public comments warrant preparing a revised PMPD. Should a revised PMPD be necessary, at the close of the comment period for the revised PMPD, the PMPD is submitted to the full Energy Commission for the Final Decision.

A Compliance Monitoring Plan and Compliance Conditions of Certification will be assembled from conditions contained in the Final Decision. The Energy Commission staff's implementation of the plan ensures that a certified facility is constructed, operated, and closed, in compliance with the conditions of certification adopted by the Energy Commission.

PUBLIC AND AGENCY COORDINATION

The Energy Commission amendment process includes a schedule that provides public comment and participation opportunities along with staff technical review and analysis. The Energy Commission seeks comments from, and works closely with, other regulatory agencies that administer LORS that may be applicable to the proposed project.

During the review process of the amendment, staff coordination includes numerous local, state, and federal agencies, that have an interest in the project. Particularly, Energy Commission staff work with the cities of El Segundo, Manhattan Beach, and Los Angeles; Los Angeles County; Los Angeles Regional Water Quality Control Board; South Coast Air Quality Management District; California Independent System Operator (California ISO); California Air Resources Board; California Coastal Commission; California Department of Fish and Wildlife; California State Lands Commission; California Department of Parks and Recreation; U.S. Environmental Protection Agency; U.S. Fish and Wildlife Service; U.S. Army Corp of Engineers; and the Federal Aviation Administration, to identify and resolve issues of concern. In addition, Commission staff coordinate the review and analysis of the project with any intervenors and interested residents of the community.

OUTREACH EFFORTS

Energy Commission staff send notices regarding receipt of a PTA and Commission events and reports related to proposed projects, at a minimum, to property owners within 1,000 feet of a project and 500 feet of a linear facility (such as transmission lines,

gas lines and water lines). Notices have also been provided to local libraries, adjacent cities and counties, Native American communities, local elected representatives and other interested parties.

On May 14, 2013, a Notice of Receipt for the ESPFM amendment was mailed to the post certification mailing list along with updated interested parties. The Hearing Officer sent a public notice to appropriate parties on July 12, 2013, for an August 13, 2013, Informational Hearing and Site Visit. The Compliance Project Manager sent a public notice to appropriate parties on September 17, 2013, for an October 1, 2013, Data Response and Issue Resolution Workshop. Staff's ongoing public and agency coordination activities for this project are discussed under the Public and Agency Coordination heading in the **Executive Summary** section of the FSA.

Staff docketed the PSA on March 23, 2014, and a Notice of Availability was docketed and mailed to the project's post-certification mail list on March 28, 2014.

On April 11, 2014, the Notice of Availability for the PSA Errata (docketed April 4, 2014), provided changes to Air Quality, Biological Resources, Public Health, and Hazardous Materials Management sections. In addition, Biological Resources-Appendix-1 Nitrogen Deposition Analysis was added since it was inadvertently not included in the PSA. The public review period for the PSA was extended from April 28, 2014, to May 5, 2014, to allow extra time to review the Errata.

The Energy Commission's outreach efforts are an ongoing process that, to date, has involved the following efforts:

LIBRARIES

On July 11, 2013, the Energy Commission staff sent the Notice of Receipt and copies of the PTA to various libraries within the project vicinity including; El Segundo Public Library, Manhattan Beach Library, Redondo Beach Public Library, Lawndale Public Library, Wiseburn Library, Masao W. Satow Library, View Park Library, Culver City Julian Dixon Library, Hawthorn Library, Lloyd Taber-Marina del Rey Library, Lennox Library, and Inglewood Public Library.

In addition, to these local libraries, copies of the PTA are also available at the Energy Commission's Library in Sacramento, the California State Library in Sacramento, as well as the public libraries in Eureka, Fresno, Los Angeles, San Diego, and San Francisco.

Staff docketed a Library Notice of Availability (NOA) for the PSA on April 1, 2014. This NOA was mailed to the Library list on the same day. A Library NOA for the PSA Errata was docketed and mailed on April 11, 2014.

PUBLIC WORKSHOPS

The Energy Commission staff provided notification by letter and enclosed notice of October 1, 2013, Data Response and Issue Resolution Workshops. In addition to property owners and persons on the post certification mailing list, notification was

provided to local, state and federal public interest and regulatory organizations with an expressed or anticipated interest in this project.

After the publication of the PSA, staff docketed a Notice of Public Workshop on April 7, 2014. The PSA workshop was held on April 22, 2014, near the project site in the city of El Segundo.

NOTIFICATION TO THE LOCAL NATIVE AMERICAN COMMUNITY

The Energy Commission Cultural Recourses staff contacted the Native American Heritage Commission to determine the appropriate communities affected by the ESEC amendment. On September 30, 2013, the local Native American communities were sent letters advising them of the proposed project and provided them with contact information. These Native American communities included: Gabrieleno Band of Mission Indians, Gabrielino-Tongva Nation, Tongva Indians of California Tribal Council, Gabrielino-Tongva Nation, Gabrielino-Tongva Tribe, Gabrielino-Tongva/San Gabriel Band of Mission Indians and Los Angeles City / County Native American Indian Commission.

In addition, these tribes were added to the ESEC project's post-certification mailing list and will therefore receive a copy of all Commission notices for events and reports related to this project.

PUBLIC ADVISER'S OFFICE

The Public Adviser helps the public participate in Energy Commission hearings and meetings. The Public Adviser assists the public by advising them on how they can participate in the Energy Commission process; however, the Public Adviser does not represent members of the public.

ENVIRONMENTAL JUSTICE

Executive Order 12898, "Federal Actions to address Environmental Justice in Minority Populations and Low-Income Populations," focuses federal attention on the environment and human health conditions of minority communities and calls on federal agencies to achieve environmental justice as part of this mission. The order requires the United States Environmental Protection Agency (U.S. 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.

Energy Commission staff conduct an environmental justice screening analysis in accordance with the "Final Guidance for Incorporating Environmental Justice Concerns in U.S. EPA's National Environmental Policy Act (NEPA) Compliance Analysis" dated April 1998. The purpose of the screening analysis is to determine whether a minority or low-income population exists within the potentially affected area of the proposed site.

California Statute, Section 65040.12 (c) of the Government Code, defines “environmental justice” to mean “fair treatment of people of all races, cultures, and incomes with respect to the development, adoption, implementation, and enforcement of environmental laws, regulations, and policies.” Staff’s specific activities, with respect to environmental justice for the ESEC amendment, are discussed in the **Executive Summary** section of this FSA.

PROJECT DESCRIPTION

Christine Stora

INTRODUCTION

On April 23, 2013, El Segundo Energy Center, L.L.C. (ESEC LLC), filed a Petition to Amend (PTA) with the California Energy Commission (Energy Commission) requesting to replace utility boiler Units 3 and 4 at the El Segundo Energy Center (ESEC) with one new combined-cycle generator (Unit 9), one new steam turbine generator (Unit 10), and two new simple-cycle gas turbines (Units 11 and 12), totaling 449 megawatts (MW). The amendment, also called the El Segundo Power Facility Modification (ESPFM) or the ESEC amendment proposes the demolition of Units 3 and 4, to be replaced with Units 9, 10, 11, and 12, and the replacement of a once-through seawater cooling system with dry-cooling technology. (NRG 2013a)

PROJECT LOCATION

The proposed project is located within the existing 33-acre ESEC power plant site. The site is located at the southernmost city limit of the city of El Segundo on the coast of the Pacific Ocean, between Dockweiler State Beach and the city of Manhattan Beach, in Los Angeles County. (See **Project Description Figures 1** and **2**.)

The address is 301 Vista Del Mar, El Segundo, approximately two miles south of the Los Angeles International Airport. The facility is located less than 0.25 mile south of the Los Angeles Department of Water & Power's Scattergood Generating Station and 0.5 mile south of the city of Los Angeles's Hyperion Wastewater Treatment Plant. The Chevron El Segundo Refinery is located across Vista Del Mar from the ESEC site. The city of Manhattan Beach is immediately to the south.

PROJECT PURPOSE AND OBJECTIVES

The purpose of this project modification is to decommission one unit, demolish two units, and add fast-start and dispatch flexibility capabilities through the installation of 435 MW net (449 MW gross) of more efficient generation. This PTA proposes the replacement of steam boilers scheduled to retire by December 31, 2015, to meet the state's once-through-cooling policy compliance deadline for ESEC. With the expected shutdown of other once-through-cooling units in the Los Angeles Basin, new generation at this location is intended to meet in-basin needs and the need for fast-start capability to complement the integration of renewable generation in the basin.

As described in the PTA, the proposed modifications are necessary to:

- Maximize use of limited existing air offsets by replacing older generating equipment with new, low-emission, combustion turbine equipment that would significantly reduce air pollutant emissions, as compared to the boilers they are

replacing, pursuant to South Coast Air Quality Management District (SCAQMD) Rule 1304;

- Redevelop a brownfield site in close proximity to existing infrastructure;
- Eliminate the need for once-through ocean water cooling by installing an air-cooled condenser;
- Remove the existing once-through cooling process at ESEC as a means to meet the state's once-through cooling policy, consistent with ESEC's stated Once-Through Cooling Implementation Plan to replace Units 3 and 4 by December 31, 2015;
- Provide grid stability to complement increased renewable energy generation by adding dispatch capabilities to accommodate planned and unplanned grid outages in response to excessive demands and natural disasters;
- Incorporate visual elements into the facility design consistent with the ESEC license and subsequent PTAs related to 00-AFC-14C that consider community input;
- Integrate community-defined site improvements, including improvements to pedestrian/bicycle use of bike path, landscaping, and frontage improvements;
- Improve fire, emergency, public safety, and environmental protections through installation and operation of new, more efficient generating units; and
- Improve public access through implementation of existing Conditions of Certification (COCs) **LAND-9** through **LAND-11**.

DESCRIPTION OF PROPOSED MODIFICATION

ESEC LLC, a wholly owned subsidiary of NRG Energy, Inc. (NRG), proposes to make substantial changes to the ESEC. Primary changes include the demolition and replacement of two, once-through-cooled, natural gas-fired utility boiler units (Units 3 and 4) with one new combined-cycle generator (Unit 9), one new steam turbine generator (Unit 10), and two new simple-cycle gas turbines (Units 11 and 12). This change would eliminate the use of ocean water for once-through cooling at the ESEC. The proposed changes would also upgrade and improve the ESEC's existing and approved site infrastructure, provide fast-start and dispatch flexibility capabilities to support Southern California grid load balancing and renewable energy integration, and implement improvements to coastal access for the public.

The existing units 3 and 4 are located on approximately 4 to 5 acres, in the northern third portion of the site. The existing Unit 3 and 4 power block structure is a 90 feet tall boxy facility with one 200 feet tall exhaust stack. The proposed units 9, 10, 11 and 12 will be located within the footprint of Units 3 and 4. The new power block facilities for Units 9, 10, 11, and 12 will be lower profile and include more spacing between the structures. Visually the new units will be less than what is currently there. See **Project Description Figures 3**, **4**, **5,** and **6**.

Specific changes proposed through this PTA include:

- Shutdown and demolition of Units 3 and 4;
- Removal and remediation of existing ESEC retention basins;
- Construction of a new, combined administration, maintenance, and operations-support building;
- Modifications to existing site access; and
- Improvements to beach access.

The following new major equipment would be installed:

- (Unit 9) - One NRG fast-start, combined-cycle generator unit (CC Fast), rated at 222 MW net, incorporating a General Electric natural gas-combustion turbine generator (CTG) designed to achieve 75 percent of base load output in 10 minutes;
- One two-pressure, duct-fired heat recovery steam generator (HRSG), designed for rapid startup with conventional selective catalytic reduction system (SCR)/carbon monoxide (CO) catalysts;
- (Unit 10) - One single-case, non-reheat axial exhaust admission condensing steam turbine generator (STG) rated at 112 MW and designed for non-traditional, elevated condensing pressure to minimize cooling system size;
- One Heller dry-cooling tower system;
- (Units 11 and 12) - Two Rolls Royce Trent 60 generators, rated at 55 MW/unit net, consisting of advanced aeroderivative, simple-cycle gas turbines; and,
- One Cleaver Brooks auxiliary boiler, consisting of a direct-contact spray condenser and a mechanically-induced-draft dry-cooling tower.

DECOMMISSIONING

In order for Units 9, 10, 11, and 12 to be constructed, Units 3 and 4 must cease operation and be removed. Unit 3 ceased operation on July 22, 2013. Unit 4 must cease operation by December 31, 2015. Units 3 and 4 are structurally connected and decommissioning and demolition would not occur until Unit 4 ceases operation. The project owner anticipates that Unit 4 would operate until December 2015, and would only cease operation earlier in order to allow for additional construction time, if needed.

DEMOLITION

Construction activities associated with the ESEC amendment include the demolition and removal of existing Units 3 and 4 and would involve:

- Removal of any asbestos and hazardous materials;
- Demolition of Unit 3 and 4 structures;

- Pull down Units 3 and 4 (20-90 feet tall—these are the main power plant structures and exhaust stacks);
- Demolish at-grade and below-grade concrete foundations;
- Crush on-site asphalt/concrete rubble; and
- Haul asphalt, concrete, and other demolition wastes.

Removal of existing Unit 3 and Unit 4 foundations would require excavations ranging from 5-20 feet deep. The deeper foundation removal excavations are located at the existing condensers and the cooling water pipes leading to the intake/discharge structure. It is anticipated that groundwater control would be provided for these excavations such that the base would be stable for placing structural fill. Structural fill would be brought up to the new power plant construction site working platform. Some new plant construction activities may take place prior to bringing up structural fill to the new site working platform. These activities may include ground improvement measures, deep foundation construction, constructing foundation mats, or laying the cooling water pipes.

ONCE-THROUGH COOLING FACILITIES

As part of this amendment, the project owner is requesting that the Energy Commission condition the once-through cooling facilities for Units 3 and 4 to be discontinued and plugged. This would include the intake/outfall tunnels for Units 3 and 4 (designated as Discharge 002) on the ESEC site east of the sea wall. The plug would be designed and constructed similar to that used to plug the Discharge 001 tunnels for Units 1 and 2, done as part of the 2007 ESEC dry-cooling amendment. All activities that involve the plugging of Discharge 002 would be on the power plant site. Permits from the State Lands Commission (SLC) would be required for off-site work activities, such as removal of the intake and outfall pipes in the ocean.

If the Energy Commission approves the PTA, the project owner would submit applications to the SLC, the U. S. Army Corps of Engineers (USACE), and the Los Angeles Regional Water Quality Control Board (LARWQCB), as needed, during the fourth quarter of 2014. The project owner anticipates that the USACE (401/404/Nationwide #7) and LARWQCB permits would be issued by October 2015, for the on-site work.

An amendment to the SLC lease for Discharge 002 would be submitted within 90 days after Unit 4 is shut down (December 2015, unless delayed), as the cessation of ocean water intake constitutes a change in lease conditions. A project description and environmental analysis for final disposition of the intake/outfall tunnels in the SLC's jurisdiction would be prepared during 2016. The project owner anticipates that the SLC would prepare an Environmental Impact Report for the alternatives and the preferred alternative during 2017 and 2018. The project owner anticipates that a selected alternative and schedule for final disposition would be determined after 2018.

BACKGROUND/HISTORY

SUMMARY

Originally built in the 1950s, the ESEC was a 1,052-MW power plant, consisting of four simple-cycle, natural gas-fired, utility boiler generating units. In 2000, the project owner applied to the Energy Commission to demolish and replace Units 1 and 2 with combined-cycle Units 5, 6, and 7, and continue the use of once-through cooling. The modified project was certified by the Energy Commission on February 3, 2005. (CEC 2005a) In 2007, the project owner petitioned to amend the 2005 Energy Commission Decision, seeking to install smaller, rapid-start, combined-cycle units, using dry-cooling technology, to be designated as Unit 5 and 6 and Unit 7 and 8. (CEC 2010a) The Energy Commission approved this amendment on June 30, 2010. As part of this PTA, Unit 3 had to cease operation prior to Units 5–8 becoming operational and producing power.

NRG started construction on Units 5-8 in June 2011, and the project started commercial operation in August 2013. The following table identifies historic, existing, and proposed unit output ratings for the facility.

Unit Output Ratings (Gross and Net MW)

Prior Total: Units 1–4			Units 5–8			Units 9–12			New Total		
Unit	**Gross**	**Net**	**Unit**	**Gross**	**Net**	**Unit**	**Gross**	**Net**	**Unit**	**Gross**	**Net**
1	183	175	5&6	286.5	280	9&10	334	325	5&6	286.5	280
2	183	175	7&8	286.5	280	11	57.4	55	7&8	286.5	280
3	343	335				12	57.4	55	9&10	334	325
4	343	335							11	57.4	55
									12	57.4	55
Total	1052	1020	Total	573	560	Total	448.8	435	Total	1021.8	995

DETAILS OF DECEMBER, 2000 APPLICATION FOR CERTIFICATION

On December 21, 2000, the then project owner (a joint venture that included NRG Energy) filed an Application for Certification (AFC) seeking approval from the Energy Commission to replace the existing Units 1 and 2 with natural gas-fired, combined-cycle electric generating units totaling 630 MW. (ESPLLC 2000a) The AFC included demolition and removal of existing Units 1 and 2 and replacement with two combustion turbines and one steam turbine (designated Units 5, 6, and 7) in their footprint. The project owner proposed to use the existing steam-cycle heat rejection system, which took cooling water from Santa Monica Bay, for the new equipment.

The Energy Commission issued a Final Decision in February 2005, certifying the project and applying conditions.

DETAILS OF JUNE, 2007 PETITION TO AMEND

On June 18, 2007, the project owner (by this time a wholly owned subsidiary of NRG Energy) submitted a PTA requesting the addition of new Rapid Response Combined Cycle (R2C2) technology that was not available during the original proceedings. R2C2 technology provided fast starts, delivering electricity more quickly to the grid, and the ability to achieve the thermal efficiency of combined-cycle units while significantly reducing startup emissions. This new technology eliminated the need for once-through cooling by equipping these units with air-cooled condensers.

The R2C2 technology also eliminated the need for wastewater discharge to the ocean or to a publicly-owned treatment plant. Other modifications in the 2007 PTA included changes in the method and route for oversize equipment delivery; modification of the plant entrance road to allow for oversize equipment delivery and improved plant access; and modifications to the construction laydown areas. The project owner was also changed in August 2008, to ESEC LLC.

In June 2008, Energy Commission staff issued its Staff Assessment Report (CEC 2008a), and, in October 2008, issued its Addendum I Staff Assessment Report. (CEC 2008b) Energy Commission staff's analysis in the respective reports noted legal challenges to the availability of SCAQMD air emission offsets through SCAQMD Rules 1304 and 1315, which corresponding delayed the Energy Commission and SCAQMD from completing their approvals of the June 2007, PTA. Regulatory and legislative resolution in January 2010, enabled SCAQMD to issue permits for the facility that relied on air emission offsets, through application of Rules 1304 and 1315.

Processing of the June 2007, PTA, resumed in 2010, at which time ESEC LLC filed a PTA Supplement to expand the scope of the request to include the permanent shutdown and closure-in-place of Unit 3, to ensure the availability of the necessary air emission offsets. The PTA Supplement was supported by additional analysis of the requested modification and the potential effects on environmental resources, compared to the previous evaluations (CEC 2008a; CEC2008b; NRG 2007; CEC 2010). The expanded PTA Supplement also included proposed changes to the approved COCs. The cosmetic and structural maintenance of Unit 3 was proposed, to ensure that it did not become an eyesore or a safety hazard. In addition, the permanent disconnection of the natural gas supply and the elimination and/or the permanent disconnection of hazardous materials storage and use associated with Unit 3 operations (e.g., lube oil, ammonia for air emissions control), were proposed. The shutdown of Unit 3 also reduced ammonia consumption and deliveries, but did not reduce the quantity of stored ammonia. This amendment was approved by the Energy Commission on June 30, 2010.

APRIL, 2012 PETITION TO AMEND CONDITIONS OF CERTIFICATION REVISIONS FOR AMMONIA USE AND FACILITY NAME CHANGE

On April 17, 2012, ESEC LLC submitted a PTA requesting to modify the range of ammonia injection rates, eliminate a venturi scrubber on the ammonia storage tank, eliminate the ammonia supply pipeline running from the Chevron refinery, and change

the project name to the ESEC. (NRG 2012a) The Energy Commission found that these changes did not have a significant effect on the environment and approved them on August 9, 2012.

FORMER AND EXISTING EL SEGUNDO ENERGY CENTER (ESEC) SITE FACILITIES

Former and current major power plant facilities present on the 33-acre ESEC project site:

- Units 1 and 2, demolished and removed from the site as part of the construction of Units 5, 6, 7, and 8;
- Units 3 and 4, comprised of once-through-cooled, natural gas-fired, utility boiler units from the 1950s that are currently generating up to 670 MW;
- Units 5 and 6 and Units 7 and 8, combined-cycle power blocks, comprised of two Siemens SGT6-5000F gas turbine generators (GTG), two BENSON technology, single-pressure HRSGs, and two Siemens STGs; the HRSG design is a single-pressure unit supplied with either a natural circulation evaporator, or a single-pass evaporator, to minimize thermal stresses during the startup process; heat in the gas turbine exhaust flue gas is recovered in the HRSG to generate high-pressure (HP) steam; the HRSG is of horizontal design and consists of an economizer, evaporator, and superheater heating surfaces; each of the STGs has a rated capacity of 60 MW; the STGs are non-reheat, single-pressure, back-pressure-type turbines;
- Two air-cooled condensers (also referred to as steam turbine fin/fan cooler, or air-cooled, back-pressure heat exchangers), utilized for steam turbine exhaust steam heat rejection;
- A 1,000,000-gallon, fire water system storage tank and a 1,000,000-gallon de-mineralized water tank;
- A Southern California Edison (SCE) switchyard within the project boundaries, owned by SCE and not part of the present project;
- Five temporary administration trailers at the site that would be removed when the permanent administration building is constructed;
- Three temporary construction trailers at the site;
- A gas-compression metering station within an enclosure;
- A retention basin for Units 3 and 4 that would be removed as part of the present project;
- An above-ground ammonia storage tank; and
- Large oil tanks removed from the south side of the project site.

PROJECT FEATURES

ADMINISTRATION BUILDING

A smaller administration-operations building that was to be located to the east of the presently proposed administration building was approved as part of the 2010 amendment approval, but was not constructed. The proposed administration-warehouse building would be located in the northern portion of the tank farm parcel, north of the former location of the North Fuel Oil Tank. The proposed administration building would be 100 feet wide, 150 feet long, and two stories tall. On the structure's north side, where the full height would be visible, the distance from the foundation line to the roof would be about 40 feet.

The building would have a contemporary design, with a flat roof, extensive use of glass, and masonry with a flat, gray finish similar to the finish of the other project structures. See **Project Description Figures 7** and **8.**

AIR QUALITY

The CC Fast and Rolls Royce Trent 60 peaker units incorporate dry, low-nitrogen-oxide (NOx) combustion systems combined with catalyst technology to control NOx and CO emissions. In this combustion system, NOx control is achieved without use of water or steam injection. The units' fast-start capability allows the gas turbine generators to reach their optimum air emissions performance operating levels faster, which significantly reduces startup emissions. The combustion and post-combustion emissions control technologies would optimize emissions reductions consistent with normal operational practices. Combustion design and clean fuels would be used to minimize emissions of other pollutants.

The HRSG for the CC Fast combined-cycle gas unit, and the exhaust ducts for the two Trent 60 simple-cycle gas turbines, would be equipped with air emissions controls equipment, including a SCR system for NOx control and an oxidation catalyst for carbon monoxide (CO) control. A continuous emissions monitoring system (CEM) would also be included, which would sample, analyze, and record the concentration of CO, NOx, and oxygen/carbon dioxide in the flue gas. The system generates a log of emissions data and provides alarm signals to the control room when the level of emissions exceeds pre-selected limits. Continuous compliance with the NOx and CO emission limits would be demonstrated with the CEM system, based on the applicable averaging time designated.

NATURAL GAS SUPPLY

Natural gas would continue to enter the ESEC at the existing metering station location to support the ESEC. Natural gas for the new Units 9, 11, and 12 and the HRSG and auxiliary boiler would be metered separately and proceed through a new natural gas compression station. An advantage of this system is the use of existing ESEC natural gas supply pipelines. No modifications to the Southern California Gas system would be required to meet the ESEC demand.

WATER SUPPLY

Similar to the permitted ESEC project design water, water would be supplied from two sources: potable water from the cities of El Segundo and Manhattan Beach (Metropolitan Water District of Southern California) and California State Title 22 reclaim water from West Basin Municipal Water District (West Basin). The ESEC amendment would use water from the West Basin for potable use and fire emergencies. The Title 22 reclaim water, single-pass reverse osmosis (RO) product water received from the District, would be used as the supply to the cycle makeup treatment system, as well as make-up to the inlet cooling, saving approximately 100 acre-feet a year (afy) of potable water. Title 22 reclaim water, irrigation quality, would be blended with the single-pass RO product water for use in the gas turbine inlet cooling. Seawater would no longer be used for heat rejection.

WASTEWATER

Process wastewaters from the CC Fast system would consist of HRSG and inlet evaporative cooler blowdowns. In addition, wastewater would be generated during off-line water washing of the 7FA.05 and Trent 60 compressors. HRSG and evaporative cooler blowdown streams would be recycled back to the single-pass RO water storage tank, partly for reprocessing by the mobile demineralizers and partly for reuse as make-up to the inlet coolers. Off-line water wash effluent would be impounded and disposed of into the city of Manhattan Beach Municipal Sanitary Sewer system. Waste streams would be sampled in accordance with the existing monitoring and reporting program to ensure that the chemistry of the process waste is within the limits of the discharge permits. While process wastewater from the CC Fast and Rolls Royce Trent 60 peaker unit system would be recycled when possible, wastewater would be disposed of off-site into the sewer system as necessary if the water cannot be recycled and processed in a manner to meet the CC Fast and Rolls Royce Trent 60 peaker unit system water quality objectives. No process wastewater would be discharged from the facility via the existing retention basin or either outfall structure. The dissolved and suspended solids captured in the demineralizer beds would be removed via regeneration process off-site. Plant drains that conveyed plant wastes from Units 3 and 4 to the retention basin would be removed.

Sanitary wastewater, including eyewash station water and shower water, would be directed to the city of Manhattan Beach Municipal Sanitary Sewer in accordance with the City Public Works Department’s discharge requirements and in accordance with existing COCs from the amended 00-AFC-14C Final Decision. The ESPFM is proposed as a zero-liquid-discharge facility, where only stormwater and sanitary effluent would leave the site.

STORMWATER DISCHARGE

Stormwater and surface drainage conveyances within the power block would be engineered to allow for segregation of stormwater discharges from non-stormwater discharges. Non-stormwater discharges would be routed to a pre-treatment system to remove oils, greases, and solids from the waste stream, then returned to the raw water tank for reuse in the power-generating process. The plant drainage system would

provide the capability to capture and contain non-stormwater discharges for off-site disposal or recycling. Per the requirement of the existing individual discharge permit, stormwater and non-stormwater runoff would be sampled prior to discharge into the ocean.

Stormwater generated during construction would be discharged under an existing Construction Stormwater National Pollutant Discharge Elimination System discharge permit obtained in compliance with existing COCs. Future site stormwater in the area of Units 5–8, following their construction, would be collected in yard drains that would route stormwater to an oil/water separator prior to discharge into the ocean.

FIRE PROTECTION

The fire protection systems limit personnel injury, loss of life, property loss, and plant downtime due to fire. The existing firewater system has been upgraded as part of the ESEC amendment; the location of the existing fire/service water storage tank and associated electric motor-driven firewater pump would not change. The firewater supply and pumping system would provide the code-required quantity of firefighting water to yard hydrants, hose stations, and water spray and sprinkler systems. Two sources of firewater would be provided. The primary source would be the existing fire/service water storage tank, and the secondary source would be the water main line from the city of Manhattan Beach.

The new firewater distribution system required for Units 5, 6, 7, and 8; proposed Units 9, 10, 11, and 12; and the new administration building-maintenance shop-warehouse would be incorporated into the existing firewater distribution system. The performance of the existing firewater distribution system would not be changed with the addition of the new loop and new services. This loop would connect into the existing fire main loop currently serving Units 3 and 4, the switchyard, and the existing fuel oil storage tank area.

TRANSMISSION SYSTEM

Implementation of the new ESPFM would not affect the approved transmission system. Consistent with the current purchase power agreement with SCE, electricity would be transmitted from SCE's El Segundo 230-kV substation to users via the existing transmission and distribution network. No new towers would need to be constructed or replaced inside or outside of the site boundaries.

PROJECT CONSTRUCTION AND OPERATION

DECOMMISSIONING, DEMOLITION AND CONSTRUCTION SCHEDULE

The entire construction and commissioning schedule is anticipated to last approximately 30 months. The decommissioning, demolition, and removal of existing Units 3 and 4 is anticipated to take approximately six months. Following completion of site preparation activities, construction and startup of the ESPFM are expected to take approximately 24 months, from site mobilization to commercial operation.

The construction schedule is based on a double-shift through the site preparation period and the construction of the major equipment foundations and pedestals. This would be followed by a single-shift, five-day workweek basis. Overtime and additional shift work may be used to maintain or enhance the construction schedule. Construction staff would range from 100 to approximately 500 construction workers, with the peak number required for approximately seven months.

The timing for implementation of the construction of already approved components of the ESPFM resulted in the shutdown of Unit 3 on July 22, 2013, and will result in the eventual shutdown of Unit 4 by December 31, 2015, to meet the State of California's requirement for once-through-cooling at the facility by that date. Commencement of demolition of Units 3 and 4 is planned for the first half of 2016. Construction of the proposed ESPFM is anticipated to commence by mid-2016, after Units 3 and 4 are removed, and to conclude in 2018, to meet a projected on-line date of summer, 2018. The demolition of units 3 and 4 and proposed unit 9, 10, 11 and 12 construction, operation, and generation, are subject to an approved power purchase agreement.

Construction of the facility is expected to accommodate concurrent efforts to minimize site constraints. The overall sequence of construction and startup includes constructing foundations, installing major piping and equipment, connecting major site interfaces, erecting major structures, and startup and testing. The schedule and staffing requirements are described in the following sections by major components.

OPERATION

The existing power plant facility requires 50 full-time employees. The proposed project would not require additional operations staff because of project efficiencies and automated operations. Plant operations for Units 5, 6, 7, 8, 9, 10, 11, and 12 would require 50 full-time employees. Plant operations would be controlled from the existing operator's panel, located in the existing control room. A distributed control and information system (DCS) would provide modulating control, digital control, and monitoring and indicating functions for operation of the plant power block systems.

Generally, the combined-cycle plant would be operated to provide its maximum electrical output throughout the year. To start the plant from a zero-percent dispatched operating mode, power would be backfed through the 230-kV transmission lines to start the combustion turbine. The turbine would be fired with natural gas. Once the turbine has been fired and brought to full speed, the CTG can be synchronized with the existing transmission grid. The STG is loaded sequentially after the CTG is loaded. Planned maintenance would be coordinated to reduce the impact of having a unit shut down for maintenance and overhauls. Normally, this work would be done during the winter when the need for electricity is reduced.

FACILITY CLOSURE

Facility closure can be temporary or permanent. Temporary closure is a shutdown for a period exceeding the time required for normal maintenance, including closure for overhaul or replacement of the combustion turbines. Causes for temporary closure

include a disruption in the supply of natural gas or damage to the plant from earthquake, fire, storm, or other natural acts. Permanent closure is a cessation in operations with no intent to restart operations owing to plant age, damage to the plant beyond repair, economic conditions, or other reasons.

For a temporary facility closure where there is no release of hazardous materials, ESEC would maintain security of the facilities on a 24-hour basis and would notify the Energy Commission and other responsible agencies. Depending on the length of the shutdown necessary, a contingency plan for the temporary cessation of operations would be implemented. The contingency plan would be designed to ensure conformance with all applicable laws, ordinances, regulations, and standards (LORS) and the protection of public health and safety, and of environmental quality. The contingency plan, depending on the expected duration of the shutdown, may include the draining of all chemicals from storage tanks and other equipment and the safe shutdown of all equipment.

The planned life of the generation facility is 30 years. However, if the facility were economically viable at the end of the 30-year operating period, it could continue to operate for a much longer period of time. As power plant operators continuously upgrade their generation equipment and maintain the equipment up to industry standards, there is every expectation that the generation facility would have value beyond its planned life.

At the time of facility closure, decommissioning would be completed in a manner that protects the health and safety of the public and is environmentally acceptable. Prior to a planned closure, the project owner would submit a specific decommissioning plan that would include the following:

- Identification, discussion, and scheduling of the proposed decommissioning activities for the power generating and other ancillary facilities;
- Description of measures taken to ensure safe shutdown and decommissioning of all equipment, including draining and cleaning of all fuel and chemical storage, and the removal of any hazardous waste;
- Identification of all applicable LORS in effect at the time of closure, and how decommissioning/closure would be accomplished in accordance with the LORS; and
- Notification to federal, state, and local agencies, including the Energy Commission.

REFERENCES

CEC 2005a—California Energy Commission (CEC-800-2005-001-CMF). El Segundo Power Redevelopment Project Commission Decision, dated February 2005.

CEC 2008a—California Energy Commission (tn 46679). Energy Commission Staff Analysis, El Segundo Power Redevelopment Project, Dry Cooling Amendment (00-AFC-14C), Los Angeles County. Submitted to Dockets, June 12, 2008.

CEC 2008b—California Energy Commission (tn: 48709). Energy Commission Staff Addendum I to the Staff Assessment Report. Submitted to Dockets, October 22, 2008.

CEC 2010—California Energy Commission (tn: 57481). El Segundo Power Redevelopment Project, Energy Commission Decision to the Amendment. Submitted to Dockets, July 8, 2010.

ESPLLC 2000a—El Segundo Power, LLC (tn 17430). Application for Certification. Submitted to California Energy Commission on December 21, 2000.

LL 2013—Locke Lord/J. McKinsey (tn: 200464). Applicant's Responses to Data Requests in Set One (#1–83). Submitted to the California Energy Commission, October 12, 2013.

NRG 2007—NRG/El Segundo Power Plant II, L.L.C. (tn: 41053). Petition to Change to Fast-Start Turbines and Dry-Cooling, Eliminating the Use of Once-Through Cooling at the El Segundo Power Redevelopment Project. Submitted to the California Energy Commission, June 19, 2007.

NRG 2010—NRG/El Segundo Energy Center, L.L.C. (tn: 54910) Supplement to the Petition to Amend the California Energy Commission's Final Decision for the El Segundo Power Redevelopment Project (00-AFC-14C). Submitted to the California Energy Commission, January 19, 2010.

NRG 2012a—NRG / El Segundo Energy Center LLC (tn 20650) Petition to Amend, dated April 2012. Submitted to California Energy Commission on April 17, 2012.

NRG 2013a—NRG/El Segundo Energy Center, L.L.C. (tn 70442). Petition to Amend. Dated April, 2013. Submitted to the California Energy Commission, April 23, 2013.

PROJECT DESCRIPTION - FIGURE 1

El Segundo Energy Center Amendment (ESEC) - Vicinity Map

CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCE: April 2013 Petition to Amend, 00-AFC-14, Fig. 1-1, CH2MHILL

PROJECT DESCRIPTION - FIGURE 2

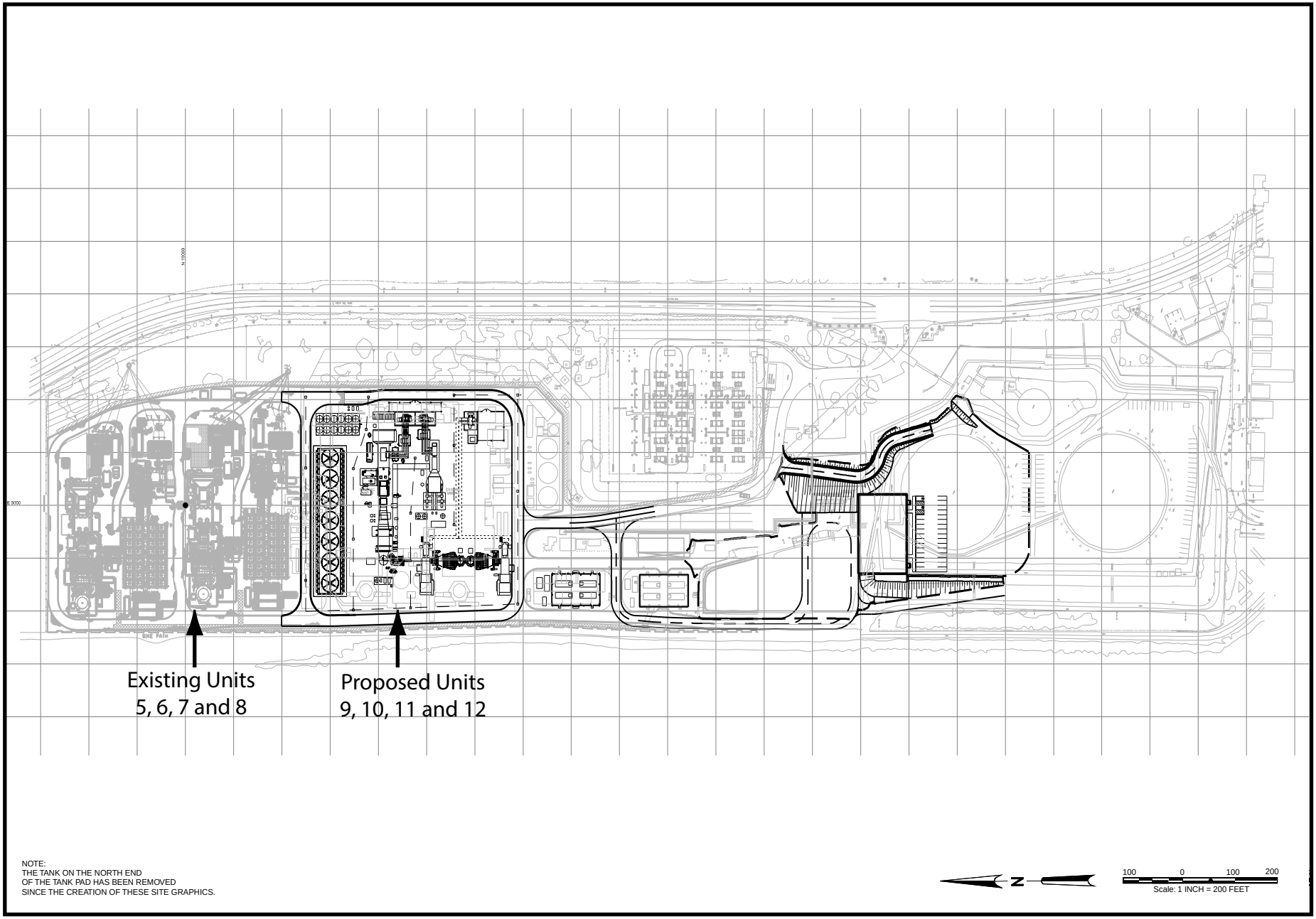
El Segundo Energy Center Amendment (ESEC)

CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCE: CEC Staff

PROJECT DESCRIPTION - FIGURE 3

El Segundo Energy Center Amendment (ESEC) - Site Plan

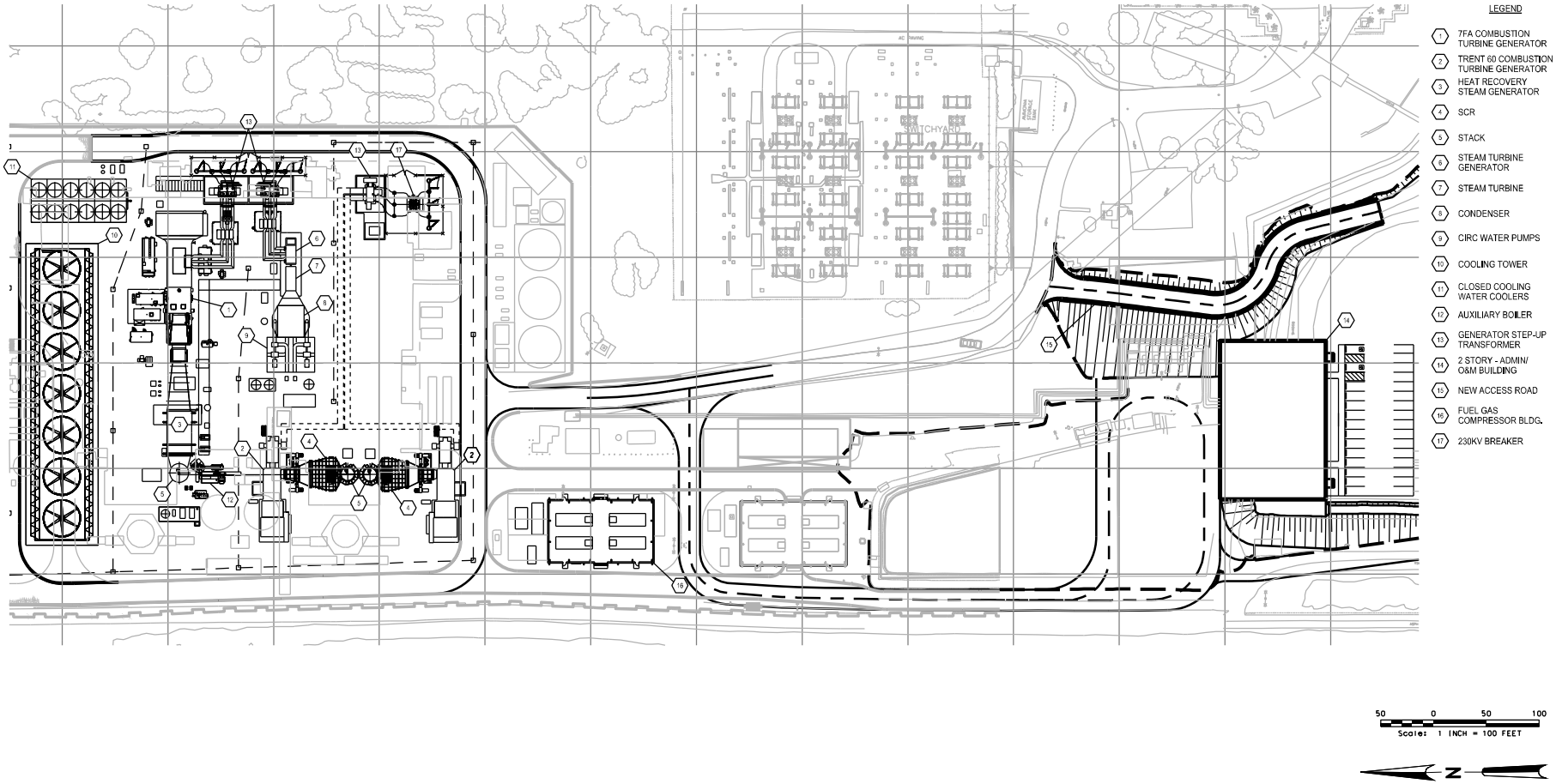


CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCE: April 2013 Petition to Amend, 00-AFC-14, Fig. 1-2a, CH2MHILL

PROJECT DESCRIPTION - FIGURE 4

El Segundo Energy Center Amendment (ESEC) - Site Plan, Sheet 2



CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCE: April 2013 Petition to Amend, 00-AFC-14, Fig. 1-2b, CH2MHILL

PROJECT DESCRIPTION - FIGURE 5

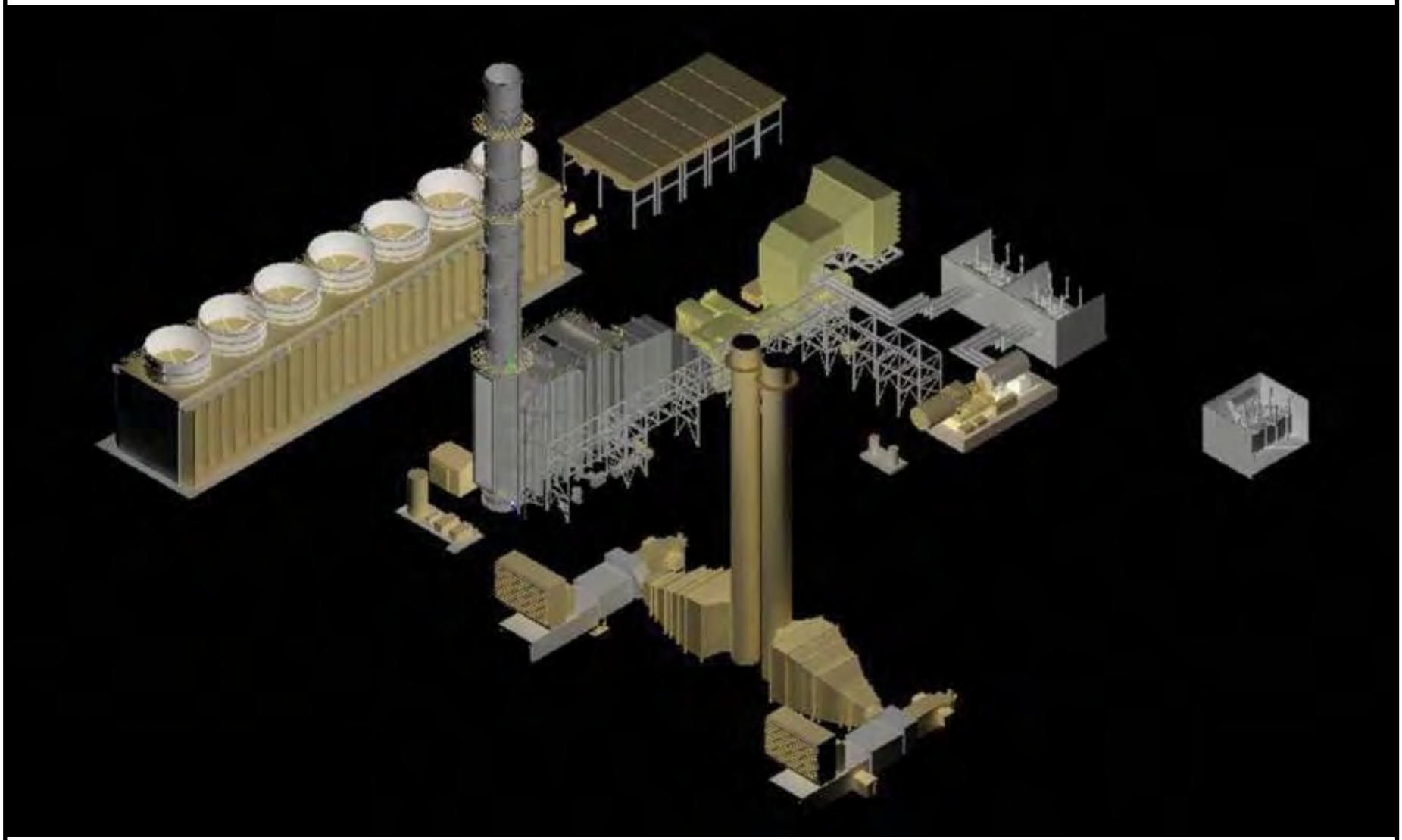
El Segundo Energy Center Amendment (ESEC) - Units 7 & 8 and Proposed 9, 10, 11 and 12

CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCE: Petition to Amend

PROJECT DESCRIPTION - FIGURE 6

El Segundo Energy Center Amendment (ESEC) - Facility Modification



CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCE: 3-D El Segundo Power, Fig. DR1-1, NRG

PROJECT DESCRIPTION - FIGURE 7

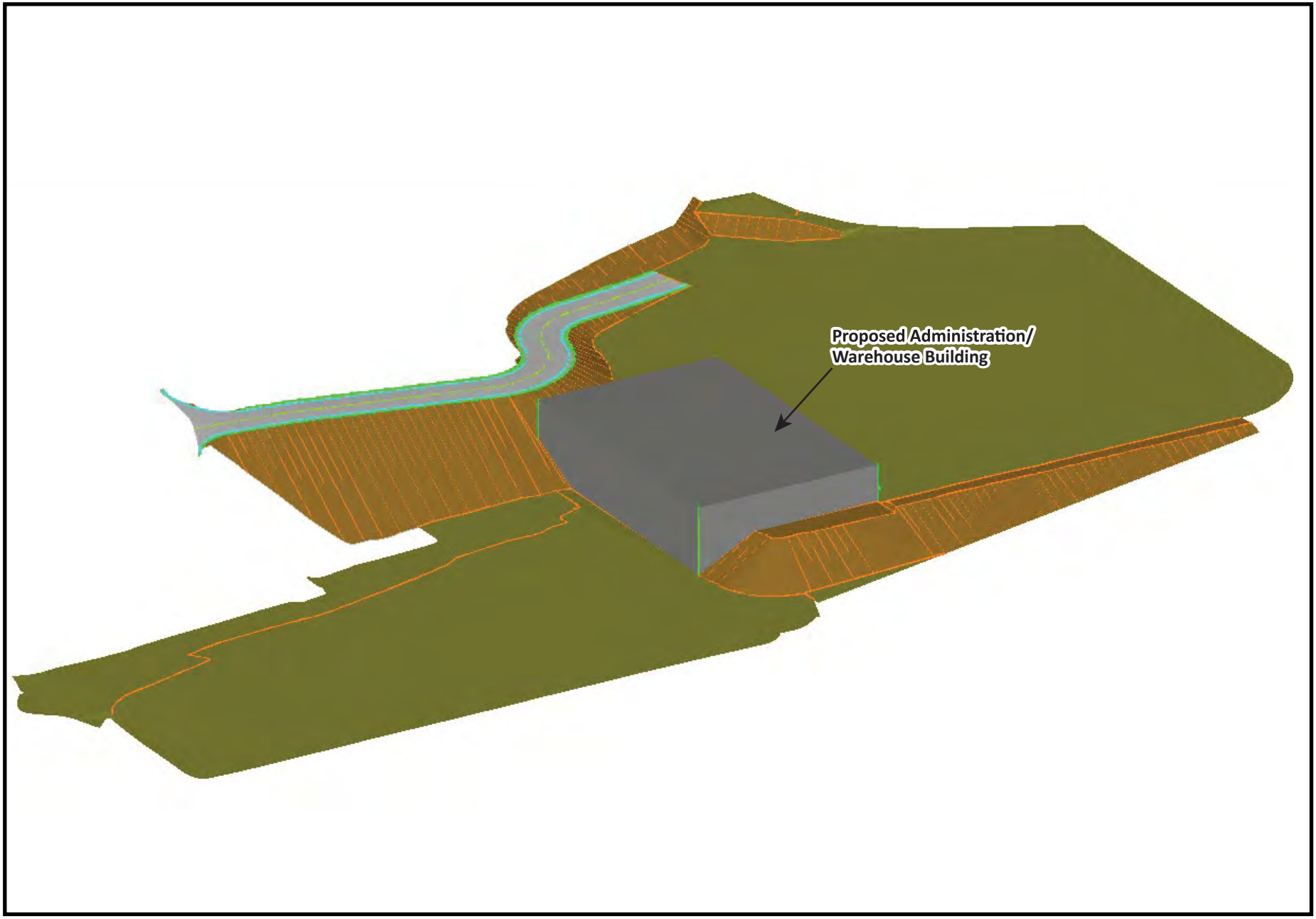
El Segundo Energy Center Amendment (ESEC) - New Administration Building

CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCE: Petition to Amend

PROJECT DESCRIPTION - FIGURE 8

El Segundo Energy Center Amendment (ESEC) - Proposed Administration/Warehouse Building Schematic/Volumetric Drawing



CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCE: Figure DR2-1, CH2MHILL

ENVIRONMENTAL ASSESSMENT

BIOLOGICAL RESOURCES

Testimony of Ann Crisp

SUMMARY OF CONCLUSIONS

The proposed El Segundo Power Facility Modification (ESPFM) project is a natural-gas-fired electrical generating facility (Units 9-12) that would replace the existing once-through-cooled boiler units (Units 3 and 4) of the El Segundo Generating Station (ESGS). The new facility would be constructed within the 33-acre site of the El Segundo Energy Center (ESEC) power plant, an operating power plant in El Segundo, California. This change would eliminate the use of ocean water for once-through cooling at the existing facility. The proposed power plant site and offsite laydown and parking areas are industrial and/or developed sites and vegetation is limited to weedy species and landscaping. Rare plants and special-status wildlife are not expected to occur onsite; however, nearby beaches and other natural areas support special-status wildlife including the Belding's savannah sparrow (*Passerculus sandwichensis beldingi*; state-listed endangered), the western snowy plover (*Charadrius alexandrinus nivosus*; federally listed threatened), California least tern (*Sterna antillarum browni*; federally and state-listed endangered), California brown pelican (*Pelecanus occidentalis californicus*, state fully protected), El Segundo blue butterfly (*Euphilotes battoides allyni*, federally listed endangered), and the monarch butterfly (*Danaus plexippus*).

Given the proximity of the proposed project to the biological resources mentioned above, construction and operation of the proposed project would result in various direct and indirect effects. Staff concludes that with implementation of proposed conditions of certification, the project would comply with all biological resources-related laws, ordinances, regulations and standards (LORS) and direct, indirect, and cumulative impacts would be avoided, minimized, or mitigated to less than significant levels (refer to **Biological Resources Table 4** for a summary of the proposed project's impacts, applicable conditions of certification and determination of significance).

Staff has proposed minor modifications to Conditions of Certification **BIO-6**, **BIO-7**, **BIO-8**, **BIO-9**, **BIO-10** from the Final Commission Decision for the 2007 amendment to address that the ESPFM project would not include the beach delivery system that was proposed but not implemented as part of the previous ESEC amendment and also to align the existing conditions of certification with current standard language included in biological resources conditions of certification. Staff has also proposed modifying Condition of Certification **BIO-8** and adding Condition of Certification **BIO-15 (Biological Monitor Selection)** to allow for approval and use of biological monitors to act on behalf of a Designated Biologist. Staff proposes to add Condition of Certification **BIO-16 (Impact Avoidance and Minimization Measures)**, which would require exclusion measures and inspection and installation of escape ramps for open trenches. Newly proposed Condition of Certification **BIO-17 (Pre-Construction Nest Surveys and Impact Avoidance and Minimization Measures for Breeding Birds)** would require a qualified biologist to monitor any bird nest locations exposed to excessive construction noise. In the PSA, staff proposed deleting **BIO-11 (U. S. Army Corps Of Engineers Permit)** and **BIO-13 (Los Angeles Regional Water Quality Control Board**

Certification) because these conditions of certification related to the beach delivery system, which is not a part of the amended project. However, Conditions of Certification **BIO-11** and **BIO-13** are required due to the decommissioning of the intake/outfall structures (Discharge 002) for the ESGS, and therefore staff has included these conditions of certification in the FSA, with minor modifications. In addition, since publication of the PSA staff has made modifications to Conditions of Certification **BIO-9**, **BIO-16**, and **BIO-17** to address comments from the project owner.

INTRODUCTION

This section of the Final Staff Assessment (FSA) provides the California Energy Commission (Energy Commission) staff's analysis of potential impacts to biological resources from the decommissioning and demolition of ESGS Units 3 and 4, and the construction and operation of the proposed ESPFM project (Units 9–12).

This analysis addresses potential impacts to special-status species, wetlands and other waters of the United States (U.S.), California coastal zone, and areas of critical biological concern. Information contained in this document includes a detailed description of the existing biotic environment, an analysis of potential impacts to biological resources and, where necessary, specifies mitigation measures (conditions of certification) to reduce impacts to less than significant levels. Additionally, this analysis assesses the project's compliance with applicable LORS.

This analysis is based, in part, on information provided in El Segundo Energy Center L.L.C's Petition to Amend (NRG 2012a), responses to staff data requests (LL 2013e; LL 2013o; LL 2013v), staff's observations during a site visit of the proposed ESPFM site on January 15, 2014; discussion at the data response workshop on October 1, 2013; and ongoing communications with the California Department of Fish and Wildlife (CDFW), and the U.S. Fish and Wildlife Service (USFWS).

COMPLIANCE WITH LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

The project owner must comply with the LORS listed in **Biological Resources Table 1** during project demolition, construction, and operation. There are no new or changed biological resource LORS since the original project was certified that would affect the proposed ESPFM project. However, staff has included Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 403), which applies due to plugging of the intake/outfall structures (Discharge 002). In addition, staff has deleted the Fish and Wildlife Coordination Act, included in the previously approved El Segundo Generating Station Power Redevelopment Project (ESPRP) and the previously amended projects, as this is a LORS that governs the action by federal agencies and is not a permit issued to a private developer. The Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. 1801 *et seq.)* expired at the end of fiscal year 2013 and the reauthorization is currently under review by the House Natural Resources Committee with the goal to amend the Act to provide flexibility for fishery managers and stability for fishermen, and for other purposes.

Biological Resources Table 1
Laws, Ordinances, Regulations, and Standards

Applicable Law	Description
Federal	
Endangered Species Act (Title 16, United States Code, section 1531 et seq., and Title 50, Code of Federal Regulations, part 17.1 et seq.)	Designates and provides for protection of threatened and endangered plant and animal species, and their critical habitat. Take of federally listed species as defined in the Act is prohibited without incidental take authorization, which may be obtained through Section 7 consultation (between federal agencies) or Section 10 Habitat Conservation Plan. The administering agencies are the U.S. Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS).
Clean Water Act (Title 33, United States Code, sections 1251 through 1376, and Code of Federal Regulations, part 33, section 330.5(c)(26))	Requires the permitting and monitoring of all discharges to surface water bodies. Section 404 requires a permit from the U.S. Army Corps of Engineers (USACE) for a discharge from dredged or fill materials into Waters of the U.S., including wetlands. Section 401 requires a permit from a regional water quality control board (RWQCB) for the discharge of pollutants. The administering agency is the USACE.
Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 403),	Requires authorization from the Secretary of the Army, acting through the USACE, for the construction of any structure in or over any navigable water of the United States. The administering agency is the USACE.
Migratory Bird Treaty Act (Title 16, United States Code, sections 703 through 711)	Makes it unlawful to take or possess any migratory nongame bird (or any part of such migratory nongame bird including nests with viable eggs). The administering agency is the USFWS.
Marine Mammal Protection Act	Title 16 United States Code, Chapter 31 1361-1375 provides protection for marine mammals. The administrating agency is the National Oceanic and Atmospheric Administration (NOAA).
Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. 1801 *et seq*.)	Primary law governing marine fisheries management in United States federal waters. Section 305 (b)(4)(A) of this act specifies that if the NMFS determines that any action undertaken (e.g. fund, permit, or carry out activities) by any state or federal agency would affect any essential fish habitat, it shall recommend measures that can be taken by such agencies to conserve such habitat. The administering agency is the NMFS.
State	
California Endangered Species Act of 1984 (Fish and Game Code, sections 2050 through 2098)	Protects California's rare, threatened, and endangered species. The administering agency is CDFW.

Applicable Law	Description
California Code of Regulations (Title 14, sections 670.2 and 670.5)	Lists the plants and animals of California that are declared rare, threatened, or endangered. The administering agency is CDFW.
Fully Protected Species (Fish and Game Code sections 3511, 4700, 5050, and 5515)	Designates certain species as fully protected and prohibits the take of such species or their habitat unless for scientific purposes (see also Title 14, California Code of Regulations, section 670.7). The administering agency is CDFW.
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 of any bird. The administering agency is CDFW.
Birds of Prey (Fish and Game Code section 3503.5	Unlawful to take, possess, or destroy any birds in the orders Falconiformes and Strigiformes or to take, possess, or destroy the nest or eggs of any such bird except as otherwise provided by code or regulation.
Migratory Birds (Fish and Game Code section 3513)	Protects California's migratory birds by making it unlawful to take or possess any migratory nongame bird as designated in the Migratory Bird Treaty Act or any part of such migratory nongame birds. The administering agency is CDFW.
Significant Natural Areas (Fish and Game Code section 1930 and following)	Designates certain areas such as refuges, natural sloughs, riparian areas, and vernal pools as significant wildlife habitat.
California Native Plant Protection Act of 1977 (Fish and Game Code section 1900 and following)	Designates state rare, threatened, and endangered plants.
California Coastal Act (Public Resources Code, sections 30000 et seq.)	The California Coastal Act of 1976 establishes a comprehensive scheme to govern land use planning along the entire California coast. The Coastal Act sets forth general policies (§30200 et seq.) which govern the California Coastal Commission's review of permit applications and local plans. Specific to energy facilities, the Coastal Act requires that the Coastal Commission designate specific locations within the coastal zone where the establishment of a thermal power plant subject to the Warren-Alquist Act could prevent the achievement of the objectives of the Coastal Act (30413(b)). Section 30231 of California Coastal Act requires actions that minimize adverse impacts to biological productivity of coastal waters. The administering agency is the California Coastal Commission.

Applicable Law	Description
Local	
El Segundo General Plan/Conservation Element	The Conservation Element of the General Plan directs the city of El Segundo to evaluate the compatibility of proposed development projects with the conservation, development, and utilization of natural resources. The El Segundo General Plan includes policies that support the following goals in the Conservation Element: beach preservation, maintenance of a safe and sufficient water supply, protection of groundwater and coastal waters from contamination, protection of the El Segundo blue butterfly, a federally-listed endangered species, and improvement of the urban landscape. The administering agency is the city of El Segundo Planning and Development Department.

SETTING

PROJECT OVERVIEW

The proposed ESPFM project would be a natural-gas-fired, air-cooled, 449-megawatt (MW) electrical generating facility that would replace the two once-through-cooled natural gas-fired utility boiler units (Units 3 and 4) of the ESGS. The ESPFM would be constructed within the 33-acre site of the existing ESEC and require demolition and removal of the existing ESGS Units 3 and 4 The ESPFM would consist of one new combined cycle generator (Unit 9), one steam turbine generator (Unit 10) and two simple-cycle gas turbines (Units 11 and 12). This change would include the installation of an air-cooled condenser and eliminate the need for the existing once-through ocean water cooling process. Equipment and facilities to be constructed and shared by the power blocks include natural gas compressors, water treatment facilities, emergency services, an administration building, maintenance shop, and warehouse. Construction of the new ESPFM and demolition of the existing units would occur over three years.

Decommissioning and closure of the once-through cooling facilities would require plugging of existing intake and outfall tunnels (Discharge 002) within the ESEC site boundary on the east side of the sea wall. Stormwater would continue to be discharged via Outfall 002 via a drop inlet installed to the west of the plug, In addition, decommissioning and final disposition of the intake/outfall tunnels within tide and submerged lands under jurisdiction of the California State Lands Commission (CSLC) would also be necessary. Decommissioning would take place under two separate permitting processes. Analysis of the plugging of the intake/outfall tunnels, which would occur completely within the boundaries of the ESEC site, is included as part of the FSA. Permits from the USACE and Los Angeles Regional Water Quality Control Board (LARWQCB) would also be required for this activity. Environmental review by the CSLC for final disposition of the tunnels within tide and submerged lands would likely be prepared during 2016 and would include preparation of a project description and environmental analysis for alternatives. The applicant provided no range of alternatives

for final disposition so any analysis would be speculative and therefore is not discussed further in this FSA.

The ESPFM would reuse existing onsite potable and reclaimed water, natural gas, stormwater, process wastewater, and sanitary pipelines and electrical transmission facilities. No offsite linear developments are proposed as part of the project. The ESPFM is proposed as a zero-liquid-discharge facility where only stormwater and sanitary effluent would leave the site.

No process wastewater would be discharged from the facility via the existing retention basin or either outfall structure. Process wastewater would be recycled when possible, wastewater would be disposed of offsite as necessary if the water cannot be recycled and processed in a manner to meet water quality objectives**.** Removal and remediation of existing ESEC retention basins would occur as part of the project. During ESPFM operation, stormwater would be collected in yard drains that would route stormwater to an oil/water separator prior to discharge. Sanitary wastewater would be directed to the city of Manhattan Beach Municipal Sanitary Sewer via existing inlets in accordance with the city Public Works Department's discharge requirements. Electricity would be transmitted to users via the existing transmission and distribution network to the adjoining Southern California Edison (SCE) switchyard that is physically within the fenced boundary of the facility. No new towers would need to be constructed or replaced inside or outside of the site boundaries.

ESPFM construction would require both onsite and offsite laydown and construction parking areas. The preferred offsite laydown and parking area located at 777 W. 190th Street in the city of Gardena, is approximately 12 acres, of which 10 acres are usable. Construction laydown and parking areas would also be established within the ESEC site boundary, as well as at offsite laydown and parking areas identified in the Energy Commission's Final Decision for El Segundo Generating Station Power Redevelopment Project (ESPRP) (CEC 2005a).

REGIONAL SETTING

The regional setting of the proposed ESPFM project encompasses the area within 10 miles of the existing ESEC site and 10 miles of the offsite laydown areas. The proposed ESPFM lies within the Los Angeles Plain subsection of the Southern California Coast Section (USDA 1997), which is characterized by flat floodplains and terraces and very gently sloped alluvial fans with small areas of marine terraces. Land use proximate to the proposed project area primarily includes urban development, industrial areas, including the Chevron Refinery, Los Angeles International Airport (LAX), parks and open space, wetlands, and El Segundo blue butterfly recovery units.

The proposed ESPFM would be located on the property of the existing ESEC at 301 Vista Del Mar. This site is approximately 2.5 miles southwest of the 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 site is located on a gently sloping coastal terrace.

The preferred offsite laydown area, located at 777 W. 190th Street in the city of Gardena, is less than ten miles southeast of the ESEC and is used for commercial truck, RV and automobile storage. The laydown site is paved, lighted, and enclosed with a perimeter fence and has an approximately 5,500 square foot industrial building on the property (ESPRP 2007a). It has approximately 10 usable acres and surveys conducted in 2007 identified the site as developed with vegetation consisting primarily of non-native plants in landscaped areas and along the fenced property boundaries. Based on a review of more current aerial photography on Google Earth from 2012 staff assessed this to still be an accurate description of the site.

Construction laydown and parking areas would also be established within the ESEC site boundary, as well as at offsite laydown and parking areas identified in the Energy Commission's Final Decision for El Segundo Generating Station Power Redevelopment Project (ESPRP) (CEC 2005a). These additional offsite laydown and parking areas are identified on Figure 3.11-2 in the Petition to Amend for the ESPRP (citation) and include the Kramer,,LAX-Pershing, Dockweiler State Beach, Hyperion, Grand Avenue, Chevron Marine Terminal sites.

Extensive urban and industrial development throughout the region has replaced most of the natural communities which are restricted to scattered open space preserves and other protected areas. 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. Other areas of vegetation within the ESEC site include several hillsides covered in ice plant (*Carpobrotus chilensis*) and landscape plantings on the east and west side of the site.

Significant Ecological Areas and Other Protected Areas

Several important ecological preserves, wetland preservation sites, and designated open spaces occur in the region. These protected areas represent some of the best remaining habitat in the region and provide important habitat for migratory birds along the Pacific Flyway as well as habitat for several special-status plants and animals, including critical habitat for the western snowy plover and USFWS Recovery Units for the El Segundo blue butterfly. Following is a brief description of each of these areas:

LAX Dunes Preserve/Airport Dunes

The LAX Dunes Preserve (Preserve) within the El Segundo sand dunes system is the largest remaining coastal dune area in Southern California comprising 307 acres of sand dunes set aside as a natural wildlife preserve. The Preserve is home to one of the few remaining colonies of the federally listed El Segundo blue butterfly. Located within the Preserve is the approximately 203 acre El Segundo Blue Butterfly Habitat Restoration Area while approximately 104 acres of undeveloped, but degraded dunes lie immediately north of the restoration area (LAWA 2013). Dune landforms include foredunes, backdunes, and deflation plains. Native vegetation communities within the Preserve include southern foredune, southern dune scrub, and valley needlegrass grassland in addition to heavily disturbed areas of non-native vegetation and developed areas (LAWA 2012). Also known as the Airport Dunes, the restoration area is home to

more than 1,000 species of plants and animals, including coast horned lizard (*Phrynosoma coronatum blainvillii*), a CDFW Species of Special Concern.

Habitat restoration at the LAX Dunes is conducted in accordance with the Los Angeles/El Segundo Dunes Habitat Restoration Plan included in the LAX Master Plan Final EIS and includes the removal of acacia, ice plant and other invasive plants (LAWA 2005; LAWA 2013). Crews also perform regular trash and debris removal, weeding, and other vegetation management activities including planting the butterfly's primary food and host plant, seacliff buckwheat (*Erigonum parvifolium*). The LAX Dunes Preserve/Airport Dunes is located approximately two miles north of the ESEC site.

Ballona Creek Wetlands

Currently covering an area of 600 acres, the Ballona Wetlands once occupied over 2,000 acres of coastal wetland in Los Angeles County. The Ballona Wetlands Ecological Reserve is the largest wetland restoration project in Los Angeles County and is owned by the state of California and managed by CDFW and CSLC as an ecological reserve. Vegetation communities include estuarine and brackish marshes, freshwater marsh and riparian habitats, coastal sage scrub, and seasonal wetlands as well as remnant sand dunes. The wetlands supports special status species such as El Segundo blue butterfly, least tern, Belding's savannah sparrow, and least bittern. El Segundo blue butterfly management by the conservation group Friends of Ballona Wetlands produced an increase in seacliff buckwheat (also known as coast buckwheat) (*Eriogonum parviflorum*) at the Ballona Wetlands Ecological Reserve (USFWS 2008). The Ballona Creek Wetlands is located approximately four miles north of the ESEC site.

Chevron El Segundo Blue Butterfly Preserve

The Chevron El Segundo Blue Butterfly Preserve is one of four locations of occupied habitat for the El Segundo blue butterfly. This 1.6-acres of remnant sand dune (Chevron Preserve) is owned by the Chevron Corporation at its refinery location in the city of El Segundo. The Chevron Preserve is the only currently known occupied site within the El Segundo Recovery unit. Although there is no formal management strategy for this site, Chevron is implementing management actions for the El Segundo blue butterfly (USFWS 2008). Recent management activities include extensive planting of seacliff buckwheat. The Chevron El Segundo Blue Butterfly Preserve is located within ½ mile of the ESEC site.

Malaga Cove

Malaga Cove is located just north of the Palos Verdes Peninsula and is a known occupied site of the federally endangered El Segundo blue butterfly in the Torrance Recovery Unit. The population of El Segundo blue butterfly in Malaga Cove is one of only four existing populations of this species and represents the southern end of its historical range (USFWS 2008). This El Segundo blue butterfly population was discovered on an eroded and iceplant dominated site in Malaga Cove in 1983. Private lands at the base of the bluffs supports seacliff buckwheat (*Eriogonum parviflorum*) the host plant of the butterfly. Malaga Cove is located approximately seven miles south of the ESEC site.

Dockweiler State Beach

Dockweiler State Beach (SB) is located at the western terminus of Imperial Highway in Playa del Rey. It is under the jurisdiction of California Department of Parks and Recreation and operated by the Los Angeles County Department of Beaches and Harbors. Dockweiler SB is comprised of nearly 288 acres of sandy beach and bluffs and more than 2 miles of ocean frontage along the shoreline of Santa Monica Bay. It contains a wide variety of land uses including public facilities, recreation amenities and natural resources including a 4.04 acre Least Tern Bird Sanctuary (California State Parks 1992). Dockweiler SB is composed of over 90 percent sandy fill material which has been imported since the 1930s. Little native vegetation is found at Dockweiler SB and only approximately 35 acres along the Vista Del Mar bluffs support plant and animal life. Vegetation is located on the bluffs and includes non-native iceplant and coastal sage scrub (California State Parks 1992). In 2013, the Los Angeles Conversation Corps was awarded a grant to restore native habitat at Dockweiler State Beach by removing iceplant, however this work has not yet been initiated. No rare or endangered plants have been identified at this site. Shorebirds as well as gulls, pelicans, loons, and terns are found inhabiting the beach. The federal and state listed California least tern and the formerly listed and state fully protected California brown pelican have been known to occur at Dockweiler SB. The 4.04 acre least tern nesting area provides foraging, nesting and roosting habitat for California least tern in a fenced sand dune area which is located approximately 4 miles north of the ESEC site. Santa Monica Bay provides habitat for marine mammals such as California gray whale, California sea lion, and Pacific bottlenose dolphin as well as benthic species and fishes. Dockweiler SB is located immediately adjacent to the bike path outside the west perimeter of the ESEC site (California State Parks 1992).

Critical Habitat

Critical habitat is a formal designation under the Endangered Species Act. In accordance with section 3(5)(A)(i) of the Act and the regulations at Title 50, Code of Federal Regulations, section 424.12, in determining which areas occupied by the species at the time of listing to designate as critical habitat, factors considered are those physical and biological features essential to the conservation of the species that may require special management considerations or protection. Critical habitat for the federally listed western snowy plover occurs in the regional vicinity of the proposed ESEC.

Western Snowy Plover

The final rule for USFWS-designated critical habitat for western snowy plover was published on June 19, 2012 (USFWS 2012a), and includes Dockweiler North and South, Dockweiler North (Subunit CA 45B) begins immediately adjacent to the northwest corner of the existing ESEC site and encompasses 65 acres, and Dockweiler South (Subunit CA 45C) which is located approximately 2.5 miles north and encompasses 34 acres. These subunits annually support a significant wintering flock of western snowy plovers in a location with high quality breeding habitat; however, a breeding site has not been spotted on Los Angeles County beaches since 1949. The beach habitats for western snowy plover within the designated critical habitat are

generally characterized by large, flat, and open spaces. Additional critical habitat is located approximately 4 miles south near Hermosa Beach.

Existing Vegetation and Wildlife

The project owner's biologist conducted two site visits to assess presence of biological resources within the proposed project area in January and February 2013. Energy Commission biological resources staff visited the site in January 2014. Botanical and wildlife surveys were previously conducted in May 2000 within the project area for the El Segundo Power Redevelopment Project (00-AFC-14), including the construction laydown and parking areas, linear facilities, and areas within the project buffer, and again in November and December 2007 within the project area for the 2007 ESPRP Petition to Amend, including the preferred offsite laydown area at 777 W. 190th Street for the proposed ESEC amendment and on the ESEC property where entrance road improvements were proposed.

The following description of existing biological resources presents the results of biological surveys of the proposed project as well as observations from staff's site visits.

Vegetation

The proposed ESPFM site and offsite laydown areas are industrial. The majority of the project area is paved or graveled and any unpaved areas are subject to regular weed control. Landscape trees and shrubs have been planted along the perimeter fencing typical of the ornamental planting mix used by various industries in the area (ESPLLC 2000a), and although native plants have been included in the planting mix, no natural habitats or wetlands are present. Species observed on site are primarily nonnative and include iceplant (*Caprobrotus* spp.), evergreen trees, palm trees, and ornamental shrubs. The majority of the previously approved offsite construction laydown and parking areas are located in various locales in El Segundo and Los Angeles and include existing paved lots (LAX-Pershing, Dockweiler State Beach, Hyperion, and Grand Avenue). The other currently proposed offsite construction laydown and parking areas that were previously approved are located on undeveloped lots surrounded by industrial developments which are characterized as unpaved areas with limited weedy vegetation (Kramer and Chevron Marine Terminal).

Species observed at the preferred offsite laydown area in 2007 were found almost exclusively along the perimeter, including myoporum (*Myoporum parviflorum*) ground cover and a variety of ornamental trees including eucalyptus, willow and pepper tree (*Schinus molle*) along the hillside (Shaw Environmental 2007). Based on a review of more recent aerial photography staff confirmed this is still an accurate description of the site. Native seed mix was used in the drainage areas along the southwest edge of the ESEC site including sand verbena (*Abronia maritime*), beach bur-sage (*Ambrosia chamissonis*), and beach evening primrose (*Camissonia cheiranthifolia*).

Within one mile of the proposed ESEC site and offsite laydown areas the following vegetation communities and land cover types are present.

- **Industrial and landfill.** This land cover type represents the largest land cover type in the survey area and includes SCE's El Segundo 230-kV substation on the southeast side of the ESEC site. The Los Angeles Department of Water & Power's Scattergood Generating Station is located less than a 1/4 mile north and the city of Los Angeles' Hyperion Wastewater Treatment Plant is located 1/2 mile north. The Chevron El Segundo refinery is located across Vista Del Mar from ESEC.
- **Urban.** Urban development represents the second largest land cover type in the survey area. It includes residential, commercial, light industrial, public schools, and other municipal facilities. The city of Manhattan Beach is immediately to the south.
- **Parks and open space.** Parks within one mile of the project area include Dockweiller State Beach and Manhattan Beach Sand Dune Park. Open spaces include the green belt along the Chevron El Segundo refinery and the Chevron El Segundo Blue Butterfly Preserve.

In addition, the flowing significant natural communities as identified by the CDFW's California Natural Diversity Database (CNDDB) are present within 10 miles of the project area.

Southern Coastal Salt Marsh

Southern coastal salt marsh occurs in areas subject to regular tidal flooding by salt water such as sheltered inland bays, estuaries, and lagoons. The distribution of plant species within the salt marsh is often in distinct zones based on the frequency and duration of tidal flooding. Typically California cordgrass (*Spartina folosia*) occurs at the lowest elevations adjacent to open water that are subject to regular, prolonged tidal inundation. The mid-elevation areas of the marsh area typically characterized by pickleweed (*Salicornia virginica*) and are generally subject to cyclical inundation during high tides and drying during low tides. The upper marsh zone is generally subject to flooding for short durations and only during higher high tides. It supports a more diverse mixture of plant species including pickleweed, saltgrass (*Distichlis spicata*), alkali heath (*Frankenia salina*), alkali weed (*Cressa truxilensis*), California seablite (*Suaeda californica*), and marsh jaumea (*Jaumea carinosa*). In the vicinity of the ESEC site, the southern coastal salt marsh habitat is found at the Ballona Wetland Ecological Reserve.

Southern Foredunes

Southern foredunes are similar to active sand dunes but are subject to less wind, have more stable sand, and greater availability of groundwater; therefore, the area supports the establishment of plant species that further stabilize the dunes. Native plant species commonly found in this habitat include beach morning glory (*Calystegia soldanella*), silver bur ragweed (*Ambrosia chamissonis*), and common eucrypta (*Eucrypta alba*). A small area of southern foredune habitat is found at the LAX Dunes Preserve/Airport Dunes.

Southern Dune Scrub

Southern dune scrub is characterized as a dense coastal scrub community of scattered shrubs, subshrubs, and herbs that are typically less than one meter tall and often associated with a high percentage of cover. This habitat type is drier, warmer, and

experiences less onshore wind when compared to central and northern dune scrub habitats. Native plants commonly found in this habitat include beach saltbush (*Atriplex leucophylla*), California croton (*Croton californicus*), California ephedra (*Ephedra californica*), mock heather (*Ericameria ericoides*), dune lupine (*Lupinus chamissonis*), desert thorn (*Lycium brevipes*), prickly pear, lemonade berry, and jojoba (*Simmondsia chinensis*). This sensitive habitat type is found at the LAX Dunes Preserve/Airport Dunes and Chevron El Segundo Blue Butterfly Preserve.

Common Wildlife

Due to the frequency and intensity of disturbance from operation of the existing ESEC, the proposed ESPFM site does not provide habitat capable of supporting a diverse assemblage of wildlife. Species that have been observed within or flying over the existing ESEC site include western fence lizard (*Sceloporus occidentalis*), American crow (*Corvus brachyrhynchus*), rock pigeon (*Columba livia*), Anna's hummingbird (*Calypte anna*), house sparrow (*Passer domesticus*), western gull (*Larus occidentalis*), northern mockingbird (*Mimus polyglottos*), black phoebe (*Sayornis nigricans*), and yellow rumped warbler (*Setophaga coronate*). Other birds protected under the Migratory Bird Treaty Act (MBTA) and CDFW codes, but without other special-status listing, such as killdeer (*Charadrius vociferous*), doves (*Zenaida* sp.), and house finches (*Haemorhous mexicanus*) may nest in open areas and in unused structures on the ESEC site.

The adjacent beach and marine areas provide habitat for common wildlife species, including various species of gulls, terns, loons, and shorebirds, as well as rock pigeon (*Columba liviaII*).

Special-Status Species

Special-status species are plant and wildlife species that have been afforded special recognition by federal, state, or local resource agencies or organizations. Listed and special-status species are of relatively limited distribution and typically require unique habitat conditions. Special-status species are defined as meeting one or more of the following criteria:

- Federally or state-listed, proposed, or candidate for listing, as rare, threatened or endangered under the Endangered Species Act or California Endangered Species Act;
- Protected under other state or federal regulations (e.g., Migratory Bird Treaty Act);
- Identified as a California Species of Special Concern by CDFW;
- California Fully Protected Species;
- A plant species considered by the California Native Plant Society and CDFW to be "rare, threatened, or endangered in California" (California Rare Plant Rank [CRPR] 1A, 1B, 2A, and 2B) as well as CRPR 3 and 4 species;
- A plant listed as rare under the California Native Plant Protection Act;

- Considered a locally significant species, that is, a species that is not rare from a statewide perspective but is rare or uncommon in a local context such as within a county or region or is so designated in local or regional plans, policies, or ordinances; or
- Any other species receiving consideration during environmental review under the California Environmental Quality Act (CEQA).

The project site is an industrial site with an operating power plant and vegetation is limited to landscaping along the perimeter of the facility and internally along berms. The offsite laydown areas are primarily within industrial areas and most are existing parking and storage areas, and vegetation is limited to a few weedy species that occur in hillsides and asphalt cracks and other areas, as well as landscaping. Rare plants and most special-status wildlife are not expected to occur onsite at either location; however, nearby beaches, parks, preserves, and other natural areas support special-status species that have the potential to be affected by construction and operation of the proposed project. **Biological Resources Table 2** identifies the nearest occurrences of special-status species reported in the California Natural Diversity Database (CDFW 2013) and California Native Plant Society's (CNPS 2013) Inventory of Rare and Endangered Plants, but the majority of the species would not be likely to occur on site.

Biological Resources Table 2
Special-status Species Known to Occur or Potentially Occurring in the Proposed ESPFM Area and the Regional Vicinity

Common Name (*Scientific Name*)	Status Fed/ State/ CRPR/G-Rank/S-Rank	Potential for Occurrence in Project Impact Area
PLANTS		
aphanisma (*Aphanisma blitoides*)	__/__/1B.2/ G3G4/ S3	**Low.** No suitable habitat occurs within the proposed project site or offsite laydown areas. The nearest CNDDB occurrence record is approximately 5 miles from the proposed ESPFM site and the nearest CNDDB record from the W 190th Street laydown area is approximately 6 miles.
marsh sandwort (*Arenaria paludicola*)	FE/SE/1B.1/ G1/ S1	**Not Likely to Occur.** No suitable habitat occurs within the proposed project site or offsite laydown areas. The nearest historic CNDDB occurrence record is over 9 miles from the ESPFM and 12 miles from the W 190th Street laydown area and is presumed extirpated. Currently known from only two locations in state.
Braunton's milk-vetch (*Astragalus brauntonii*)	FE/__/1B.1/ G2/S2	**Not Likely to Occur.** No suitable habitat occurs within the proposed project site or offsite laydown areas. The nearest CNDDB occurrence record is

Common Name (*Scientific Name*)	Status Fed/ State/ CRPR/G-Rank/S-Rank	Potential for Occurrence in Project Impact Area
		over 10 miles from the proposed ESPFM site and the W 190th Street laydown area.
Ventura Marsh milk-vetch (*Astragalus pycnostachyus* var *lanosissimus*)	FE/SE/1B.1/ G2T1/S1	**Low.** No suitable habitat occurs within the proposed project site or offsite laydown areas. The nearest CNDDB occurrence records are historic locations which are over 5 miles from both the ESPFM site and the W 190th Street laydown area however all records are considered extirpated.
coastal dunes milk-vetch *Astragalus tener* var*. titi*	FE/SE/1B.1/ G2T1/S1	**Low.** No suitable habitat occurs within the proposed project site or offsite laydown areas. CNDDB occurrence records are mapped in the general vicinity of Santa Monica and in the general vicinity of Hyde Park in Inglewood. Both of the nearest CNDDB records to the proposed ESPFM site are historical and likely extirpated.
South Coast saltscale (*Atriplex pacifica*)	__/__/1B.2/ G3G4/ S2	**Not Likely to Occur.** No suitable habitat occurs within the proposed project site or offsite laydown areas. The nearest CNDDB occurrence record is from Redondo Beach and is approximately 6 miles from the proposed ESPFM site and the W 190th Street laydown area.
Parish's brittlescale (*Atriplex parishii*)	__/__/1B.1/ G1G2/ S1	**Not Likely to Occur.** No suitable habitat occurs within the proposed project site or offsite laydown areas. CNDDB occurrence records are near Long Beach, near Santa Monica and near Redondo Beach. The nearest CNDDB record is within 6 miles from the proposed ESPFM site and the W 190th Street laydown area.
Davidson's saltscale (*Atriplex serenana var. davidsonii*)	__/__/1B.2/ G5T2?/ S2?	**Not Likely to Occur.** No suitable habitat occurs within the proposed project site or offsite laydown areas. CNDDB occurrence records are from near Los Angeles, Cienega, and San Pedro and are all historical and likely extirpated. The nearest CNDDB record is 9 miles from the proposed ESPFM site and the nearest CNDDB record from the W 190th Street laydown area is over 11 miles away.
Santa Barbara morning-glory (*Calystegia sepium ssp.*	__/__/1B.1/ G5T1/S1	**Not Likely to Occur.** No suitable habitat occurs within the proposed project site or offsite laydown areas. The nearest CNDDB occurrence records

Common Name (*Scientific Name*)	Status Fed/ State/ CRPR/G-Rank/S-Rank	Potential for Occurrence in Project Impact Area
binghamiae)		are historic locations which are over 9 miles from both the ESPFM site and the W 190th Street laydown area and all records are considered possibly extirpated.
southern tarplant (*Centromadia parryi ssp. australis*)	__/__/1B.1/ G3T2/S2	**Not Likely to Occur.** Though multiple records exist in the regional area, the ESPFM site and offsite laydown areas are unlikely to support this species given lack of native habitat. The nearest CNDDB occurrence records are approximately 5 miles north of the ESPFM site and the nearest CNDDB occurrence record from the W 190th Street laydown area is less than a mile east along both sides of the Dominguez Channel.
Orcutt's pincushion (*Chaenactis glabriuscula* var. *orcuttiana*)	__/__/1B.1/ G5T1/S1	**Low.** Though records exist in the regional area, the ESPFM site and offsite laydown areas are unlikely to support this species given lack of native habitat and prior disturbance at site. The nearest CNDDB occurrence record is within 1 mile of the ESPFM site and approximately 7 miles from the W 190th Street laydown area.
coastal goosefoot (*Chenopodium littoreum*)	__/__/1B.2/ G2/S2	**Low.** No suitable habitat occurs within the proposed project site or offsite laydown areas. The nearest CNDDB occurrence record is a historic record approximately 4 miles north of the ESPFM site and presumed extirpated.
salt marsh bird's-beak (*Chloropyron maritimum* ssp. *maritimum* (formerly *Cordylanthus maritimus* ssp. *maritimus*)	FE/SE/1B.2/ G4?T1/S1	**Low.** No suitable habitat occurs within the proposed project site or offsite laydown areas. The nearest CNDDB occurrence record are historic locations which are over 8 miles from both the ESPFM site and the W 190th Street laydown area however all records are considered extirpated.
San Fernando Valley spineflower (*Chorizanthe parryi var. fernandina*)	FC/SE/1B.1/ G2T1/S1	**Low.** No suitable habitat occurs within the proposed project site or offsite laydown areas. The nearest CNDDB occurrence record is a historic location approximately 4 miles from the ESPFM site and 12 miles from the W 190th Street laydown area near the Ballona Creek Wetland however this record is considered likely extirpated.
beach spectaclepod (*Dithyrea maritima*)	__/ST/1B.1/ G2/S2.1	**Low.** Though historical records exist in the El Segundo area, the ESPFM site and offsite

Common Name (*Scientific Name*)	Status Fed/ State/ CRPR/G-Rank/S-Rank	Potential for Occurrence in Project Impact Area
		laydown areas are unlikely to support this species given lack of native habitat and prior disturbance at site. This species is presumed extirpated from historical locations however habitat may remain at the LAX El Segundo Dunes Preserve.
Los Angeles sunflower (*Helianthus nuttallii ssp. parishii*)	__/__/1A/ G5TH /SH	**Not Likely to Occur.** No suitable habitat occurs within the proposed project site or offsite laydown areas. Last seen in 1937 and presumed extirpated from California. The nearest historical record is approximately 9 miles from the ESPFM site and 10 miles from the W 190th Street laydown area and presumed extirpated.
Coulter's goldfields (*Lasthenia glabrata ssp. coulteri)*	__/__/1B.1/ G4T3/S2.1	**Not Likely to Occur.** No suitable habitat occurs within the proposed project site or offsite laydown areas. Though historical CNDDB occurrence records exist in the El Segundo area, the ESPFM site and offsite laydown area are unlikely to support this species given lack of native habitat and history of disturbance at site. This species is presumed extirpated from historical locations near the offsite laydown area.
mud nama *(Nama stenocarpum*)	__/__/2B.2/ G4G5/S1S2	**Not Likely to Occur.** No suitable habitat occurs within the proposed project site or offsite laydown areas. Nearest CNDDB occurrence records are a historic and located over 10 miles from the ESPFM site. One of these records is approximately 5 miles from the W 190th Street laydown area located near Harbor Regional Park.
Gambel's water cress (*Nasturtium gambelii*)	FE/ST/1B.1/ G1/S1	**Not Likely to Occur.** No suitable habitat occurs within the proposed project site or offsite laydown areas. Nearest CNDDB occurrence record is from the Los Angeles area and is a historic record that is presumed extirpated.
spreading navarretia (*Navarretia fossalis*)	FT/__/1B.1/ G1/S1	**Not Likely to Occur.** No suitable habitat occurs within the proposed project site or offsite laydown areas. The nearest CNDDB occurrence record is a historic record from the Los Angeles area that is presumed extirpated.

Common Name (*Scientific Name*)	Status Fed/ State/ CRPR/G-Rank/S-Rank	Potential for Occurrence in Project Impact Area
prostrate vernal pool navarretia (*Navarretia prostrata*)	__/__/1B.1/ G2/S2	**Not Likely to Occur.** No suitable habitat occurs within the proposed project site or offsite laydown areas. Several historical CNDDB occurrence records exist within 3 miles of the ESPFM site and the W 190th Street laydown area however these locations are likely extirpated.
Coast woolly-heads (*Nemacaulis denudata var. denudata*)	__/__/1B.2/ G3G4T3?/ S2.2	**Low.** No suitable habitat occurs within the proposed project site or offsite laydown areas. The nearest CNDDB occurrence record is over 10 miles from both the ESPFM site and the W 190th Street laydown area.
California Orcutt grass (*Orcuttia californica)*	FE/SE/1B.1/G1/ S1	**Not Likely to Occur.** No suitable habitat occurs within the proposed project site or offsite laydown areas. Species was documented approximately 5 miles northwest of the offsite laydown area, but this CNDDB occurrence records is presumed extirpated.
Lyon's pentachaeta (*Pentachaeta lyonii*)	FE/SE/1B.1/G2/ S2	**Not Likely to Occur.** No suitable habitat occurs within the proposed project site or offsite laydown areas. The nearest CNDDB occurrence record is located over 10 miles from the ESPFM and approximately 5 miles from the W 190th Street laydown area.
Brand's phacelia (*Phacelia stellaris*)	FC/__/1B.1/ G1/S1	**Low.** No suitable habitat occurs within the proposed project site or offsite laydown areas. The nearest CNDDB occurrence record is approximately 3 miles north of the project area and approximately 6 miles east of the offsite laydown area.
Ballona cinquefoil (*Potentilla multijuga*)	__/__/1A/ GX/SX	**Not Likely to Occur.** No suitable habitat occurs within the proposed project site or offsite laydown areas. Last seen in 1890 and presumed extirpated from California, recent surveys have not detected this species.
salt spring checkerbloom, (*Sidalcea neomexicana*)	__/__/2B.2/ G4?/S2S3	**Not Likely to Occur.** No suitable habitat occurs within the proposed project site or offsite laydown areas. The nearest CNDDB occurrence record is approximately 6 miles north of the ESPFM site and approximately 15 miles north of the W 190th Street laydown area.
estuary seablite	__/__/1B.2/	**Not Likely to Occur.** No suitable habitat occurs

Common Name (*Scientific Name*)	Status Fed/ State/ CRPR/G-Rank/S-Rank	Potential for Occurrence in Project Impact Area
(*Suaeda esteroa*)	G3/S2	within the proposed project site or offsite laydown areas. The nearest CNDDB occurrence records occur approximately 15 miles from the ESPFM site and approximately 9 miles from the W 190th Street laydown area near the mouth of San Pedro Bay.
San Bernardino aster (*Symphyotrichum defoliatum*)	__/__/1B.2/ G2/S2	**Not Likely to Occur.** No suitable habitat occurs within the proposed project site or offsite laydown areas. Although there are several historical CNDDB occurrence records located between 9 and 20 miles of the ESPFM site and of the W 190th Street laydown area all are presumed extirpated.
WILDLIFE		
Fish		
Mojave tui chub (*Gila bicolor mohavensis*)	FE/SE/FP/ G4T1/S1	**Not Likely to Occur.** No suitable habitat occurs within the ESPFM site or offsite laydown areas. This species was formerly found in deep pools and slough-like areas of the Mojave River, but now only occurs in highly modified refuge sites in San Bernardino County.
Invertebrates		
Belkin's dune tabanid fly (*Brennania belkini*)	__/__/__/ G1G2/S1S2	**Low.** Though CNDDB occurrence records exist in the El Segundo area, the ESPFM site and offsite laydown areas are unlikely to support this species given lack of native habitat and prior disturbance at site. The nearest CNDDB occurrence record is located less than a mile from the ESPFM site at Manhattan Beach.
Bucsk's gallmoth (*Carolella busckana*)	__/__/__/ G1G3/SH	**Not Likely to Occur.** No suitable habitat occurs within the proposed project site or offsite laydown areas. Although there is a historical CNDDB occurrence record located within 2 miles of the ESPFM site it is presumed extirpated.
sandy beach tiger beetle (*Cicindela hirticollis gravida*)	__/SA/__/ G5T2/S1	**Low.** Though CNDDB occurrence records exist in the El Segundo area, the ESPFM site and offsite laydown areas are unlikely to support this species given lack of native habitat and prior disturbance at site. The nearest CNDDB occurrence record is located less than a mile from the ESPFM site at Dockweiler State Beach. Species inhabits areas adjacent to non-brackish

Common Name (*Scientific Name*)	Status Fed/ State/ CRPR/G-Rank/S-Rank	Potential for Occurrence in Project Impact Area
		water along the California coast.
senile tiger beetle (*Cicindela senilis frosti*)	__/__/__/ G4T1/S1	**Low.** Though CNDDB occurrence records exist in the El Segundo area, the ESPFM site and offsite laydown areas are unlikely to support this species given lack of native habitat and prior disturbance at site. The nearest CNDDB occurrence record is located less than a mile from the ESPFM site at Manhattan Beach. Species inhabits marine salt marsh areas along the California coast.
globose dune beetle (*Coelus globosus*)	__/__/__/ G1/S1	**Low.** Although CNDDB occurrence records exist in the El Segundo area, the ESPFM site and offsite laydown areas are unlikely to support this species given lack of native habitat and prior disturbance at site. The nearest CNDDB occurrence records are located within 1 mile from the ESPFM site at the Chevron El Segundo Blue Butterfly Preserve and within 2 miles at the LAX El Segundo Dunes Preserve .
Monarch butterfly (*Danaus lexippus*)	__/SA/__/ G5/S3	**Moderate.** Although not recorded on site, could roost in landscape trees throughout the ESEC site. The nearest CNDDB occurrence record for a roosting site is less than one mile from the ESPFM site however this site is presumed extirpated. Nearest active roost site is located within 4 miles from the ESPFM site. Roosts in wind-protected tree groves along the California coast in winter.
Henne's eucosman moth (*Eucosma hennei*)	__/__/__/ G1/S1	**Low.** Although CNDDB occurrence records exist in the El Segundo area, the ESPFM site and offsite laydown areas are unlikely to support this species given lack of native habitat and prior disturbance at site. The nearest CNDDB occurrence record is within 2 miles of the ESPFM site at the LAX El Segundo Dunes Preserve .
El Segundo blue butterfly (*Euphilotes battoides allyni*)	FE/__/__/ G5T1/S1	**Moderate.** Although CNDDB occurrence records exist in the El Segundo area, the ESPFM site and offsite laydown areas are unlikely to support this species given lack of native habitat and prior disturbance at site. However, hosts plants for the species, seacliff buckwheat, were detected as part of surveys for the ESEC amendment (NRG

Common Name (*Scientific Name*)	Status Fed/ State/ CRPR/G-Rank/S-Rank	Potential for Occurrence in Project Impact Area
		2014c). These plants are located outside the ESEC site at Dockweiler SB and could potentially support the species. The nearest CNDDB occurrence records are located within 1 mile from the ESPFM site at the Chevron El Segundo Blue Butterfly Preserve and within 2 miles at the LAX El Segundo Dunes Preserve .
Palos Verde blue butterfly (*Glaucopsyche lygdamus palosverdesensis*)	FE/__/__/ G5T1/S1	**Not Likely to Occur.** No suitable habitat occurs within the proposed project site or offsite laydown areas. The ESPFM site and W 190th Street laydown area are not within the known range of the species which is endemic to the Palos Verdes Peninsula. The nearest CNDDB occurrence records are located over 7 miles from the ESPFM site and W 190th Street laydown area.
Lange's El Segundo dune weevil (*Onychobaris langei*)	__/__/__/ G1/S1	**Low.** Although CNDDB occurrence records exist in the El Segundo area, the ESPFM site and offsite laydown areas are unlikely to support this species given lack of native habitat and prior disturbance at site. The nearest CNDDB occurrence record is within 2 miles of the ESPFM site at the LAX El Segundo Dunes Preserve .
wandering skipper (*Panoquina errans*)	__/__/__/ G4G5/S1	**Not Likely to Occur.** No suitable habitat occurs within the proposed project site or offsite laydown areas. The nearest CNDDB occurrence record is located over 9 miles from the ESPFM site and of the W 190th Street laydown area.
El Segundo flower loving fly (*Rhaphiomidas terminatus terminatus*)	__/__/__/ G1T1/S1	**Low.** Although CNDDB occurrence records exist in the El Segundo area, the ESPFM site and offsite laydown areas are unlikely to support this species given lack of native habitat and prior disturbance at site. The nearest CNDDB occurrence record is located over 7 miles from the ESPFM site and the W 190th Street laydown area.
Gertsch's socalchemmis spider (*Socalchemmis gertschi*)	__/__/__/ G1/S1	**Not Likely to Occur.** No suitable habitat occurs within the proposed project site or offsite laydown areas. The nearest CNDDB occurrence record is located over 3 miles from the ESPFM site and 11 miles from the W 190th Street laydown area.
Dorothy's El Segundo dune	__/__/__/	**Low.** Although CNDDB occurrence records exist

Common Name (*Scientific Name*)	Status Fed/ State/ CRPR/G-Rank/S-Rank	Potential for Occurrence in Project Impact Area
weevil (*Trigonoscuta dorothea*)	G1T1/S1	in the El Segundo area, the ESPFM site and offsite laydown areas are unlikely to support this species given lack of native habitat and prior disturbance at site. The nearest CNDDB occurrence records are located within 3 miles from the ESPFM site at the LAX El Segundo Dunes Preserve and at the Ballona Wetlands Ecological Reserve.
mimic tyronia (*Tryonia imitator*)	__/__/__/ G2G3/S2S3	**Not Likely to Occur.** No aquatic habitat occurs at the ESPFM site or offsite laydown areas. The nearest CNDDB occurrence record located approximately 4 miles from the ESPFM site and over 11 miles from the W 190th Street laydown area is possibly extirpated.
Reptiles and Amphibians		
silvery legless lizard (*Anniella pulchra pulchra*)	__/CSC/__/ G3G4T2T3Q/S2	**Not Likely to Occur.** No suitable habitat occurs within the ESPFM project site or offsite laydown areas. The nearest CNDDB occurrence record is located over 9 miles from the ESPFM site and 4 miles from the W 190th Street laydown area.
western pond turtle (*Emys marmorata*)	__/CSC/__/ G3G4/S3	**Not Likely to Occur.** No aquatic habitat occurs at the ESPFM site or offsite laydown areas. The nearest CNDDB occurrence record located over 4 miles from the ESPFM site is possibly extirpated.
coast horned lizard (*Phrynosoma blainvillii*)	__/CSC/__/ G4G5/S3S4	**Low.** No suitable habitat occurs within the ESPFM site or offsite laydown areas. The species inhabits open areas of sandy soil and low vegetation in valleys, foothills and semiarid mountains from sea level to 8,000 ft. Nearest CNDDB occurrences are all extirpated by development.
two-striped garter snake (*Thamnophis hammondii)*	__/CSC/__/ G3/S2	**Not Likely to Occur.** No aquatic habitat occurs at the ESPFM site or offsite laydown areas. The nearest CNDDB occurrence record located over 11 miles from the ESPFM site.
Birds		
tricolored blackbird (*Agelaius tricolor*)	BCC/CSC/__/ G5T2T4/S2S3	**Low.** No suitable habitat occurs within the ESPFM site or offsite laydown areas. The species is known to occur in the regional vicinity of the ESPFM site in marsh habitats, including the Madrona Marsh and Harbor Lake. The

Common Name (*Scientific Name*)	Status Fed/ State/ CRPR/G-Rank/S-Rank	Potential for Occurrence in Project Impact Area
		nearest CNDDB occurrence approximately 7 miles from the ESPFM site and 4 miles from the W 190th Street laydown area. .
Burrowing owl (*Athene cunicularia*)	BCC/CSC/__/ G4/S2	**Low.** No suitable habitat occurs within the ESPFM site or offsite laydown areas. The species is known to occur in the regional vicinity of the ESPFM site, including the Ballona Wetlands Ecological Reserve. The nearest CNDDB occurrence approximately 4 miles from the ESPFM site.
Swainson's hawk (*Buteo swainsoni*)		
Western snowy plover (*Charadrius alexandrinus nivosus*)	FT/CSC/__/ G4T3/S2	**High.** This species has been reported less than one mile from the proposed ESPFM site at Dockweiler State Beach (SB) which annually supports a significant wintering flock. There is designated critical habitat immediately adjacent to the northwest corner of the ESPFM site as well as approximately 3 miles north of the site. This species has not successfully bred at Dockweiler SB since the 1940s due to increased human activity. Requires sandy, gravelly, or friable soils for nesting.
southwestern willow flycatcher (*Empidonax traillii extimus*)	FE/SE/__/ G4T3/S2	**Not Likely to Occur.** No suitable habitat occurs within the ESPFM site or offsite laydown areas. The nearest CNDDB occurrence over 10 miles from the ESPFM site and 5 miles from the W 190th Street laydown area.
California black rail (Laterallus jamaicensis coturniculus)	__/ST/__/ G4T1/S1	**Low.** No suitable habitat occurs within the ESPFM site or offsite laydown areas. Though historical CNDDB occurrence records exist in the El Segundo area, the ESPFM site and offsite laydown area are unlikely to support this species given lack of native habitat and history of disturbance at site. The nearest CNDDB occurrence approximately 2 miles from the ESPFM site.
Belding's savannah sparrow (*Passerculus sandwichensis beldingi*)	__/SE/__/ G5T3/S3	**Low.** No suitable habitat occurs within the ESPFM site or offsite laydown areas. The species is known in several of the wetland preserves in the regional vicinity of the proposed

Common Name (*Scientific Name*)	Status Fed/ State/ CRPR/G-Rank/S-Rank	Potential for Occurrence in Project Impact Area
		project site, including the Ballona Wetlands Ecological Reserve. The nearest CNDDB occurrence approximately 4 miles from the ESPFM site.
California brown pelican (*Pelecanus occidentalis californicus*)	FD/SD/FP/ G4T3/S1S2	**High.** No suitable habitat occurs within the ESPFM site or offsite laydown areas. This species has recorded known roost over 3 miles from the ESPFM site near Marina Del Rey. Observed offshore and flying over the ESPFM site during surveys in 2006, 2011, and 2012 and also flying offshore near ESPFM site during staff site visit on January 15, 2014.
Coastal California gnatcatcher (*Polioptila californica californica*)	FT/CSC/__/ G3T2/S2	**Not Likely to Occur.** No suitable habitat occurs within the ESPFM site or offsite laydown areas. The species is known from coastal sage scrub in regional vicinity of the ESPFM project site, including along the Palos Verdes Peninsula. The nearest CNDDB occurrence approximately 5 miles from the ESPFM site.
bank swallow (*Riparia riparia*)	__/ST/__/ G5/S2S3	**Low.** No suitable habitat occurs within the ESPFM site or offsite laydown areas. Nearest CNDDB occurrences are all extirpated by development.
California least tern (*Sternula antillarum browni*)	FE/SE/FP/ G4T2T3Q/ S2S3	**Moderate.** No suitable habitat occurs within the ESPFM site or offsite laydown areas. This species is known to breed in regional area at tidal salt/mud flats over 3 miles from the ESPFM site in the Ballona Wetlands Ecological Reserve. Historically nested in beach habitat but increased human disturbance has made these habitats unsuitable for breeding.
Mammals		
Pallid bat (*Antrozous pallidus*)	__/CSC/__/ G5/S3	**Not Likely to Occur.** No suitable habitat occurs within the ESPFM site or offsite laydown areas. The nearest CNDDB occurrence record is historic and from 1930s, over 7 miles from the ESPFM site. Common roost sites for this species are rock crevices, old buildings, bridges, caves, mines, and hollow trees.
Western mastiff bat (*Eumops perotis californicus*	__/CSC/__/ G5T4/S3?	**Not Likely to Occur.** No suitable habitat occurs within the ESPFM site or offsite laydown areas.

Common Name (*Scientific Name*)	Status Fed/ State/ CRPR/G-Rank/S-Rank	Potential for Occurrence in Project Impact Area
		This species is present only where there are significant rock features offering suitable roosting habitat or may roost in buildings with appropriately proportioned cracks.
silver haired bat (*Lasionycteris noctivagans*)	__/__/__/ G5/S3S4/ WBWG-M	**Not Likely to Occur.** No suitable habitat occurs within the ESPFM site or offsite laydown areas. The nearest CNDDB occurrence record is 8 miles from the ESPFM site. This species roosts in hollow trees, snags, buildings, rock crevices, caves, and under bark.
hoary bat (*Lasiurus cinereus*)	__/__/__/ G5/S4?/ WBWG-M	**Low.** No suitable habitat occurs within the ESPFM site or offsite laydown areas. The nearest CNDDB occurrence records are historic and from 1930-1950s, over 7 miles from the ESPFM site. This species winters along the coast and in southern California, and generally roosts in dense foliage of medium to large trees.
South Coast marsh vole (*Microtus californicus stephensi*)	__/CSC/__/ G5T1T2/S1S2	**Not Likely to Occur.** No suitable habitat occurs within the HBEP site or offsite laydown areas. The nearest CNDDB occurrence record is located over 3 miles from the ESPFM site in the Ballona Wetlands Ecological Reserve. It occurs in tidal marshes in Los Angeles, Orange, and Southern Ventura counties.
pocketed free-tailed bat (*Nyctinomops femorosaccus*)	__/CSC/__/ G4/S2S3/ WBWG-M	**Not Likely to Occur**. No suitable habitat occurs within the ESPFM site or offsite laydown areas. The nearest CNDDB occurrence record is over 7 miles from the ESPFM site. This species is colonial and roosts primarily in crevices of rugged cliffs, high rocky outcrops and slopes.
Pacific pocket mouse (*Perognathus longimembris pacificus*)	FE/CSC/__/ G5T1/S1	**Not Likely to Occur.** No suitable habitat occurs within the HBEP site or offsite laydown areas. Though historical CNDDB occurrence records exist in the El Segundo area, the ESPFM site and offsite laydown area are unlikely to support this species given lack of native habitat and history of disturbance at site. Presumed extirpated in the local area. Suitable habitats for the contains fine-grain sandy substrates on the coastal strand, coastal dunes, river alluvium and coastal sage scrub.
Southern California	__/CSC/__/	**Not Likely to Occur.** No suitable habitat occurs

Common Name (*Scientific Name*)	Status Fed/ State/ CRPR/G-Rank/S-Rank	Potential for Occurrence in Project Impact Area
saltmarsh shrew (*Sorex ornatus salicornicus*)	G5T1? /S1	within the ESPFM site or offsite laydown areas. The nearest CNDDB occurrence record is presumed extirpated and located over 3 miles from the ESPFM site in the Ballona Wetlands Ecological Reserve. Occurs in coastal marshes and requires dense vegetation and woody debris for cover.

Sources: CDFW 2013a; CNPS 2013

Biological Resources Table 2 – Notes

STATUS CODES:

State
CSC: California Species of Special Concern. Species of concern to CDFW because of declining population levels, limited ranges, and/or continuing threats have made them vulnerable to extinction.
SE: State listed as endangered
SR: State listed as rare
ST: State listed as threatened
SFP: Fully protected
WL: Watch List: includes species formerly on California Species of Special Concern List (Remsen 1978) but which did not meet the criteria for the current list of special concern bird species (Shuford and Gardali 2008).
SA: Special Animal. Species is tracked in the CNDDB (due to rarity, limited distribution in California, declining throughout the range, etc.) but holds no other special status at the state or federal level.

Federal
FE: Federally listed endangered: species in danger of extinction throughout a significant portion of its range
FT: Federally listed, threatened: species likely to become endangered within the foreseeable future
BCC: Fish and Wildlife Service: Birds of Conservation Concern: Identifies migratory and non-migratory bird species (beyond those already designated as federally threatened or endangered) that represent highest conservation priorities
http://www.fws.gov/migratorybirds/NewReportsPublications/SpecialTopics/BCC2008/BCC2008.pdf
D: Delisted taxon that is considered recovered

California Native Plant Society (CNPS (California Rare Plant Ranks (CRPR)
List 1A: Presumed Extirpated in California and Either Rare or Extinct Elsewhere
List 1B: Rare, threatened, or endangered in California and elsewhere
List 2A: Presumed Extirpated in California but more common elsewhere
List 2B: Rare, Threatened, or Endangered in California, But More Common Elsewhere
List 3: Plants About Which More Information is Needed - A Review List

List 4: Limited distribution – a watch list
0.1: Seriously threatened in California (high degree/immediacy of threat)
0.2: Fairly threatened in California (moderate degree/immediacy of threat)
0.3: Not very threatened in California (low degree/immediacy of threats or no current threats known)

Global Rank/State Rank
Global rank (G-rank) is a reflection of the overall condition of an element throughout its global range. Subspecies are denoted by a T-Rank; multiple rankings indicate a range of values
G1 = Less than 6 viable element occurrences (EOs) OR less than 1,000 individuals
G2 = 6-20 EOs OR 1,000-3,000 individuals
G3 = 21-100 EOs OR 3,000-10,000 individuals
G4 = Apparently secure; this rank is clearly lower than G3 but factors exist to cause some concern; i.e., there is some threat, or somewhat narrow habitat.
G5 = Population or stand demonstrably secure to ineradicable due to being commonly found in the world.
State rank (S-rank) is assigned much the same way as the global rank, except state ranks in California often also contain a threat designation attached to the S-rank. An H-rank indicates that all sites are historical
S1 = Less than 6 element occurrences (EOs) OR less than 1,000 individuals
S1.1 = very threatened
S1.2 = threatened
S1.3 = no current threats known
S2 = 6-20 EOs OR 1,000-3,000 individuals
S3 = 21-100 EOs or 3,000-10,000 individuals

S4 = Apparently secure in California; this rank is clearly lower than S3 but factors exist to cause some concern, i.e., there is some threat or somewhat narrow habitat. No threat rank.
S5 = Demonstrably secure or ineradicable in California. No threat rank.
SH = All California occurrences historical (i.e., no records in > 20 years).

Potential Occurrence:

High – Suitable habitat is present within or near the proposed site: occurrence records exist for species in proximity to the site; species expected to occur on or near site

Moderate – Low quality habitat is present within or near the proposed site; species was not identified during reconnaissance surveys of the site; species may occur on or near site

Low – Marginal habitat is present on or adjacent to site; no recent records within 10 miles of the site

Not Likely to Occur – No recent records within 10 miles, no suitable habitat occurs on or near site

Special-Status Plant Species

The proposed ESPFM site and offsite laydown areas are entirely developed with no natural habitats present. The vegetation observed during the January and February 2013 site visits by the project owner and the Energy Commission staff site visit in January 2014 was limited to landscaping trees and shrubs and forbs, ice plant, and a few scattered weedy plants. As the potential for special-status plants to occur at the proposed ESPFM site and offsite laydown area is low, rare plant surveys were not conducted for the amendment. However, special-status plant surveys were conducted in 2000 and 2007 and no species were detected. In addition, no special status plant species were detected during construction monitoring conducted in 2011-2012 (CEC 2014c). Special status plants have been documented in the regional vicinity of the proposed project, however most populations are considered extirpated. It is unlikely that special-status plants would colonize the project site or the offsite laydown area, but in the event that would occur on unpaved or landscaped areas, vegetation and weed management practices at both sites would preclude persistence. While no special-status plant species were detected, two patches of seacliff buckwheat (a flowering plant) are present adjacent to the bike path outside the perimeter of the ESEC site (NRG 2014c). While the plant itself is not endangered, this plant is the larval host to the federally-endangered, El Segundo blue butterfly.

Special-Status Wildlife

The project owner conducted general reconnaissance surveys of the project site in January and February 2013. No protocol or focused surveys were performed as the potential for special-status wildlife species to occur within the proposed project site and offsite laydown and parking areas is low. The following accounts focus on species with a moderate or high potential to occur on or near the site, and that could be affected by project construction and operation.

Birds

The project region supports a wide range of both resident and migratory bird species. The area is located within the Pacific Flyway, a very broad corridor stretching along the Pacific Coast from Mexico north to Alaska and into Siberia, Russia. Birds utilizing the area surrounding the project site and the regional vicinity include resident breeding birds, migratory birds that breed in the region but winter elsewhere, birds that forage and rest in the area during migration between breeding and wintering grounds, and species that winter in the project region. Species observed onsite during site visits and monitoring of the construction of the prior ESEC amendment include American crow,

rock pigeon, Anna's hummingbird (*Calypte anna*), house sparrow, western gull, northern mockingbird, black phoebe, and yellow rumped warbler. Species observed using the retention basin, which would be removed as part of the ESPFM and replaced with an administrative building, include gulls, egret, mallard (*Anas platyrhynchos*), and swallows. Nesting habitat on site is limited to landscaped areas including trees, and birds that nest on the ground on gravely substrates such as killdeer could also nest on site. Small mammals and reptiles as well as landscape plants provide foraging opportunities for birds on site. Native birds, regardless of any additional conservation status at the local, state, or federal level, are afforded protection by the MBTA and California Fish and Game Code. Nesting bird surveys were conducted by the project owner in 2011 in areas of vegetation along the south side of the ESEC prior to activities related to construction of Units 5-8. No active or inactive nests were detected during surveys within the plant boundaries and one inactive nest was detected in a palm tree outside the plant site near the main entrance (NRG 2011a, NRG 2011b).

California Brown Pelican

The California brown pelican (*Pelecanus occidentalis*) is a California state "fully protected species" pursuant to Fish and Game Code section 3511(b)(2). It is a large water bird with a dark brownish body, a long pouched bill, and long broad wings. This species was formerly state and federally listed as endangered, but was de-listed in 2007 due to recovery of the population (Burkett et al. 2007). Brown pelicans feed on a variety of fish species which they catch by diving from the air into the water. This species nests in colonies usually on offshore islands and other isolated areas lacking mammalian predators and human disturbances (Zeiner, et al 1988-1990).

California brown pelicans are considered common in the regional vicinity of the proposed ESPFM site and have been observed foraging offshore of the ESEC site near the rock groin terminus (LL 2013v). It has also been documented at a major day and night roost site approximately 3miles from the proposed ESPFM site near Marina Del Rey (CDFW 2013).

The coastal habitat adjacent to the site provides foraging habitat for the species in the immediate vicinity of the site; however, there is no natural habitat on the proposed ESPFM site and the potential for occurrence on site is low. Additionally, it is not expected to breed in adjacent habitat due to lack of typical breeding habitat.

California Least Tern

The California least tern (*Sternula antillarum browni*) is federally and state-listed as endangered. The California least tern nests along the west coast of North America, from Baja California, Mexico, north to the San Francisco Bay area (USFWS 1980). This subspecies was listed as endangered by federal and state agencies due to a population decline resulting from loss of habitat (Cogswell 1977). It has long narrow wings and a broad forked tail. The body is white with pale gray and black-tipped wings. The head is black capped with a white streak across the forehead and the bill is yellow with a black tip. This subspecies forages for fish in open water habitats including near shore ocean waters, tidal channels, and estuaries. It breeds in open sandy areas, dirt, and dry mud near suitable foraging habitat. The species establishes nesting colonies on sandy soils

with little vegetation along the ocean, lagoons, and bays. Their nests are shallow depressions lined with shells or other debris (Massey 1974). Least terns are generally present at nesting areas between mid-April and late September (Massey 1974; Cogswell 1977; Patton 2002), often with two waves of nesting during this time period (Massey and Atwood 1981).

In the project region, California least terns nest at Ballona Wetlands Ecological Reserve and Venice Beach (CDFW 2013). It forages at Marina Del Rey, Ballona Creek, Ballona Lagoon and canals in the area. Historically, California least tern nested along the entire strand of Dockweiler State Beach. Currently, there is a managed California least tern colony at the north end of Dockweiler State Beach near Venice Beach in Marina Del Rey (CDFW 2013). There is no suitable nesting habitat for the California least tern at the proposed ESPFM site and it has very limited potential to occur on the site. However, the species would likely use the neighboring coastal areas for foraging.

Western Snowy Plover

The western snowy plover (*Charadrius alexandrinus nivosus*) is a federally listed threatened species and a California Species of Concern. This small shorebird is about 6 inches long, it has a thin dark bill and is pale brown to gray above with a white or buff colored underside with darker patches on its shoulders and head. It typically forages for small invertebrates in wet or dry beach sand, in salt marshes, and within low foredune vegetation (USFWS 2007).. The Pacific coast breeding population of the western snowy plover currently extends along coastal beaches from the southern portion of Washington State to southern Baja California, Mexico. This population breeds primarily above the high-tide line on coastal beaches, sand spits, dune-backed beaches, sparsely vegetated dunes, beaches at creek and river mouths, and salt pans at lagoons and estuaries. Less common nesting habitats include bluff-backed beaches, dredged material disposal sites, salt pond levees, dry salt ponds, and river bars (USFWS 2007). The snowy plover winters mainly in coastal areas from southern Washington to Central America. In winter, snowy plovers are found on many of the beaches used for nesting as well as on beaches where they do not nest, in man-made salt ponds, and on estuarine sand and mud flats. There have been no documented cases of a western snowy plover nesting within Los Angeles County since 1949 when they were recorded nesting at Manhattan Beach. The nearest active nesting site is at Bolsa Chica in Orange County located over 25 miles south of the proposed ESPFMsite (CDFW 2013). The breeding season for the western snowy plover normally extends from March 1 through September 15, however the first nest at Bolsa Chica in 2009 occurred on February 23 and courting behavior has been observed as early as late January (Knapp and Peterson 2009).

Poor reproductive success resulting from human disturbance, predation, and inclement weather, combined with permanent or long-term loss of nesting habitat to urban development has led to the decline in active nesting colonies as well as an overall decline in the breeding and wintering population of the western snowy plover along the Pacific coast of the United States. In southern California, extensive recreational beach use by humans has precluded the western snowy plover from breeding in several historically used beach strand areas (USFWS 2007).

The final rule for USFWS revised designated critical habitat for western snowy plover was published on June 19, 2012 (USFWS 2012), and includes the Dockweiler North, (subunit CA 45B) and Dockweiler South (subunit CA 45C). The subunits CA 45B and 45C at Dockweiler State Beach were occupied at the time of listing and are currently occupied (USFWS 2012). The subunits, in conjunction with Hermosa Beach (subunit 45D) annually support a significant wintering flock of western snowy plover in a location with high-quality breeding habitat. This location contains the physical or biological features essential to the conservation of the species, including a wide sandy beach with occasional surfcast wrack supporting small invertebrates.

Historically, the western snowy plover bred along Santa Monica Bay from Hermosa Beach to Santa Monica. At least one pair of snowy plover remained at Dockweiler State Beach through the nesting season in 2008 (CDFW 2008).There is no suitable nesting habitat for the western snowy plover at the proposed ESPFM site and it has very limited potential to occur on the site. The species has been reported immediately adjacent to the ESEC site utilizing the beaches in the vicinity of the site for foraging and loafing during the winter.

Invertebrates

Monarch Butterfly

The monarch butterfly (*Danaus plexippus*) is a NatureServe Global Rank 5 (G5) and State Rank 3 (S3). NatureServe provides information about the status of a taxon, both throughout its entire range and within California. The G5 rank for species is defined as “Secure” and is considered common; widespread and abundant. However, the S3 rank monarch butterfly in California is defined as “Vulnerable” and is vulnerable in the jurisdiction due to a restricted range, relatively few populations or occurrences, recent and widespread declines, or other factors making it vulnerable to extirpation for species. This butterfly is found from southern Canada south through all of the United States, Central America, and most of South America. It is also present in Australia, Hawaii, and other Pacific Islands (BMNA 2013). It overwinters in central Mexico and along the coastal California. The host plant for the caterpillar stage includes several species of milkweeds including common milkweed (*Asclepias syriaca*), swamp milkweed (*A. incarnata*), and showy milkweed (*A. speciosa*); and milkweed vine in the tropics. Adults utilize a variety of species for nectar feeding including milkweeds as well as other species early in the season before milkweeds bloom and in the fall. This distinctive species is orange and black with white spot and the male and female are sexually dimorphic (i.e..sexes of a given species differ in coloration). It is between 3 3/8 and 4 7/8 inches.

Historically, monarch butterfly utilized native California trees as roosts sites including western sycamore (*Platanus racemosa*), Torrey pine (*Pinus torreyana*), Monterey pine (*Pinus radiata*), and Monterey cypress (*Cupressus macrocarpa*). However, in the 1920s the widespread introduction of non-native eucalyptus trees occurred and these trees became the favored roosting trees for monarchs due to the protection the trees provided from rain, wind, and chilling temperatures. The monarch has been experiencing steady declines in recent years and population monitoring at overwintering sites in California

and Mexico have documented significant declines in the number of monarchs returning to those sites (Xerces 2014). Reasons for decline include loss of overwintering sites in Mexico due to deforestation and in California due to development, degradation of overwintering habitat in California due to aging trees, loss of breeding habitat due to the ongoing decline of native milkweeds (*Asclepias* spp.), their larval host plants, and disease, parasitism, and predation. Management needs include development of conservation and management plans for all wintering sites, migration corridors, and principal breeding areas.

There is marginal overwintering habitat for the monarch butterfly at the proposed ESPFM site which may utilize Torrey pine, such as those planted along the western boundary of the ESEC site, as a roost tree. However, it has very limited potential to occur on the site as monarch butterflies commonly display site fidelity to overwintering sites and many of these locations are used year after year. To date monarch butterfly have not been reported roosting on the ESEC site. The species has been previously reported to have a roost site less than one mile from the proposed ESPFM site however this site is presumed extirpated. The nearest active roost site is located within 4 miles from the proposed ESPFM site (CDFW 2013).

El Segundo Blue Butterfly

The El Segundo blue butterfly (*Euphilotes battoides allyni*) is a federally listed endangered species. This butterfly is endemic to coastal sand dunes and is known only from the El Segundo sand dunes and the northwestern Palos Verdes peninsula in southwestern Los Angeles County, California (USFWS 1998). The El Segundo dunes once encompassed 4.5 square miles between Westchester and the Palos Verdes Peninsula while suitable habitat on the Palos Verdes peninsula likely included about 20 acres. The adults have a wingspan of 0.75 to 1.25 inches and the males and females are sexually dimorphic. The males wings are a brilliant blue color with an orange border on the rear of the upper hindwings while the females have dull brown colored wings with an orange border on the upper distal surface of the hindwings. The life cycle includes one, or rarely two, generations, of adults per year (USFWS 2008). The El Segundo blue butterfly is dependent on seacliff buckwheat (*Eriogonum parviflorum*) for survival of as each of its four life stages (egg, larva, pupa, and adult) depend on this plant (USFWS 2008). The adult's flight period lasts from 4 days to two weeks beginning in mid June and lasts until early September. It feeds on seacliff buckwheat pollen and nectar, and mate and lay eggs on seacliff buckwheat flowers. During the caterpillar (larval) stage, individuals remain concealed within flower heads and feed primarily on seacliff buckwheat seeds. During the pupal (cocoon) stage, which lasts for one or more year, individuals fall to the ground and remain buried either underground or in the leaf litter at the base of the seacliff buckwheat until they emerge as adult butterflies (USFWS 1998).

At the time of the 5-year review by the USFWS in 2008, the range of the species was estimated to be have been reduced by 86 percent (USFWS 2008) This is a slight improvement since the time of listing in 1976 and due to it now also being known to occur in the Torrance recovery unit, specifically on beach bluffs between Malaga Cove and Redondo Beach (USFWS 2008.).The reasons for decline and current threats to this species include urban development and invasion by exotic species which have resulted

in a significant loss and modification of the species' habitat (USFWS 1998). Other threats include off-road vehicles and overcollecting (USFWS 1998). While critical habitat has not been established for this species the USFWS Recovery Plan recommended the protection of four Recovery Units (RUs) that include adequate habitat and area to prevent the extinction of the butterfly. The El Segundo blue butterfly is extant at seven sites within three disjunct locations: two sites at the Airport Dunes location; the Chevron Preserve, and four sites near or north of Malaga Cove. These seven sites are included in the four RUs: Ballona Recovery Unit, Airport Dunes Recovery Unit, El Segundo Recovery Unit, and the Torrance Recovery Unit. All known populations are under threat, by habitat destruction, inadequacy of existing regulatory mechanisms, habitat modification, overutilization, predation, and extinction vulnerability due to small population sizes and isolation. In addition, habitat fragmentation produces edge effects that facilitate the introduction of invasive, nonnative weeds, primarily iceplant, that can out-compete and supplant the El Segundo blue butterfly's host plant, seacliff buckwheat.

The El Segundo blue butterfly has recently been discovered at newly occupied sites within its known range. In addition, long-term survey data from the LAX Dunes shows population numbers of El Segundo blue butterfly appear to have fluctuated greatly over time and generally trend up or down based on rainfall. These fluctuations are typical of insect populations which are dependent on their host plant. LAX Dunes has experienced an increase in butterfly numbers of about 65-130 times (depending on the year) since the start of restoration (LAWA 2012). However, survey methods have not been consistent over time which makes it impossible to assess long-term trends in population (USFWS 2008). Based on 2012 surveys of the LAX Dunes the seasonal population was estimated to be approximately 83,000 to 87,000 butterflies (LAWA 2012). Restoration activities, including removal of invasive iceplant and other non-native species and the planting of native plants, including the host plant for the species, at Torrance Beach and Ballona Wetlands Ecological Preserve have seen a return of blue butterfly to these sites through natural recolonization. An individual El Segundo blue butterfly was identified in the Ballona Wetlands in 1985, however by 2008 it was considered extinct at this location during the USFWS 5-year review (USFWS 2008). However, surveyors conducting presence/absence surveys in 2013 observed 199 butterflies which reestablished this location as an occupied site (Psomas 2013). There is also funding in place to restore native dune habitat at Dockweiler State Beach by removing iceplant and planting native plants. However, the intensity of long-term protection and management activities at locations such as LAX Dunes and the Chevron Preserve and other potentially restored areas have been variable over time and no permanent conservation easements exist at any of these occupied sites (Porter, pers. comm.). In addition, much of the remaining lands that could potentially be restored are under private ownership. Therefore, while the number of sites the butterfly is known to occur is increasing there is no regulatory program in place to require such activities long-term.

The proposed ESPFM site is located within the El Segundo Recovery Unit, however the site is not identified as habitat for the El Segundo blue butterfly. Potential restored habitat, defined as habitat that if restored could potentially support the species, is located immediately adjacent to the south boundary of the plant as well as north of the

plant. The host plant for the blue butterfly, seacliff buckwheat (*Eriogonum parvifolium*), also known as dune or coast buckwheat, was detected immediately west of the existing ESEC site during surveys for the prior ESEC amendment (NRG 2014c) in 2011. Two patches of dune buckwheat are present adjacent to the bike path (NRG 2014c). El Segundo blue butterfly larvae could occur on or around these plants however this species has not been detected previously near the ESEC site. The nearest occupied habitat is located within 1 mile from the proposed ESPFM project at the Chevron El Segundo Blue Butterfly Preserve and habitat is also located within 2 miles at the LAX Airport/El Segundo Dunes Preserve.

Jurisdictional Wetlands and Waters

The project site is actively maintained to facilitate operation of existing power generation and therefore does not support wetlands potentially under the jurisdiction of USACE, CDFW, and/or the California Coastal Commission (CCC). Wetlands potentially under the jurisdiction of USACE, CDFW, and/or CCC are located adjacent to the preferred offsite laydown area. Waters under the jurisdiction of USACE (i.e. navigable waters of the United States) do occur on site as the Unit 3 and 4 forebay is hydrologically connected to jurisdictional waters via the intake/outfall tunnels. Waters under the jurisdiction of USACE include Santa Monica Bay. Santa Monica Bay is identified as an estuarine and marine wetland by the National Wetland Inventory (NWI). Four of the previously approved laydown and parking area are located at existing devolped areas near Dockweiler SB and Santa Monica Bay. The preferred offsite laydown area is located less than 100 feet from the banks of the Dominquez Channel, a riverine habitat identified by the NWI.

IMPACT ASSESSMENT

METHOD AND THRESHOLDS FOR DETERMINING SIGNIFICANCE

A significant impact is defined under CEQA as “a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project” (Cal. Code Regs., tit. 14, [hereinafter CEQA Guidelines] section 15382). In this analysis, the following impacts to biological resources are considered significant if the project would result in:

- a substantial adverse effect to wildlife species that are federally-listed or state-listed or proposed to be listed; a substantial adverse effect to wildlife species of special concern to CDFW, candidates for state listing, or animals fully protected in California;
- a substantial adverse effect to plant species considered by CDFW, USFWS, or CNPS to be rare, threatened, or endangered in California or with strict habitat requirements and narrow distributions; a substantial impact to a sensitive natural community (i.e., a community that is especially diverse; regionally uncommon; or of special concern to local, state, and federal agencies);

- substantial adverse effects on habitats that serve as breeding, foraging, nesting, or migrating grounds and are limited in availability or that serve as core habitats for regional plant and wildlife populations;
- interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites;
- substantial adverse effect on important riparian habitats or wetlands and any other "Waters of the U.S." or state jurisdictional waters; or
- conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.

DIRECT AND INDIRECT IMPACTS AND MITIGATION

The CEQA Guidelines define direct impacts as those impacts that result from the project and occur at the same time and place. Indirect impacts are caused by the project, but can occur later in time or farther removed in distance and are still reasonably foreseeable and related to the operation of the project. Direct or indirect impacts on biological resources could be permanent or temporary in nature. All impacts that result in the irreversible removal of biological resources are considered permanent. Any impact considered to have reversible effects on biological resources can be viewed as temporary.

This section evaluates the potential direct, indirect, permanent, and temporary impacts to biological resources from proposed ESPFM construction and associated demolition activities, operation, maintenance, and decommissioning, and provides mitigation, as necessary, to reduce impacts to less than significant levels.

General Biological Resources Conditions of Certification

The demolition of existing Units 3 and 4 and construction and operation of new Units 9 through 12 would result in similar impacts to biological resources as the demolition of Units 1 and 2 and the construction and operation of the existing Units 5 through 8. The conditions of certification from the ESEC license are recommended by staff as being adequate to avoid or minimize potentially adverse impacts to biological resources as a result of the current amendment, including retaining the requirement that a Designated Biologist be employed to ensure impact avoidance and minimization measures described below are implemented and sensitive biological resources described above are protected. The selection criteria and minimum qualifications of the Designated Biologist are described in Condition of Certification **BIO-6** (**Designated Biologist**). The duties and authority of the Designated Biologist are described in Conditions of Certification **BIO-7 (Designated Biologist Duties**) and **BIO-8** (**Designated Biologist and Biological Monitor Authority**). The Designated Biologist would be responsible, in part, for developing and implementing a Worker Environmental Awareness Program (WEAP) (see Condition of Certification **BIO-10**), which is a mechanism for training the on-site project construction and maintenance personnel and project site visitors on the how to protect sensitive biological resources and the consequences of non-compliance.

Condition of Certification **BIO-9** (**Biological Resources Mitigation Implementation and Monitoring Plan (BRMIMP)** provides for the preparation of the BRMIMP, which consolidates all project resource mitigation, monitoring, and compliance measures, as well as other information necessary to ensure compliance with, and effectiveness of, all impact avoidance, minimization, and mitigation measures. Minor modifications to Conditions of Certification **BIO-6**, **BIO-7**, **BIO-8**, **BIO-9**, **BIO-10** have been proposed by staff to address that the El Segundo Power Facility Modification (ESPFM) project would not include the beach delivery system that was proposed but ultimately not implemented as part of the previous ESEC amendment and also to align the existing conditions of certification with current standard language included in the biological resources conditions of certification. Staff has also proposed modifying Condition of Certification **BIO-8** and adding Condition of Certification **BIO-15 (Biological Monitor Selection)** to allow for approval and use of biological monitors to act on behalf of a Designated Biologist, as determined necessary by the approved Designated Biologist.

DEMOLITION AND CONSTRUCTION IMPACTS AND MITIGATION

Demolition and Construction Impacts to Native Vegetation

Demolition and construction impacts to vegetation could occur through the direct removal or crushing of plants by equipment or vehicles. As these impacts are generally localized and are primarily temporary, they are not usually considered significant unless the habitat type is regionally unique or is known to support special-status species.

The proposed project area is developed as industrial with disturbed habitat and ornamental landscaping. Regionally unique habitat or habitat capable of supporting special-status species is not present within the proposed project site. Demolition and construction activities would require the removal of weedy and ornamental vegetation such as iceplant *Caprobrotus* spp.). Some ornamental plantings (landscaping) would be replaced by new plantings as part of updates to visual screening landscape plan to address replacement of unsuccessful plantings (refer to the **Visual Resources** section for additional information). Significant impacts to native vegetation would not occur and no mitigation is proposed.

Demolition and Construction Impacts to Common Wildlife

Direct loss of small mammals, reptiles, and other less mobile species could occur during demolition of existing facilities and construction of the proposed project . This would result primarily from the use of vehicles and equipment at the ESPFM site, which could collapse underground burrows or drive over animals. Additionally, demolition and construction activities and increased human presence may temporarily disrupt breeding or foraging activities of some common wildlife species.

The proposed project area provides marginally suitable nesting habitat for a variety of common bird species. Birds could nest in the ornamental plantings along the perimeter of the ESPFM site. Additionally, some bird species adapted to disturbed environments could nest in equipment or other available substrate in the areas within the ESPFM site. Many adult birds would flush from equipment during project construction. However, nestlings and eggs of ground-nesting birds or birds nesting on ornamental trees, other

landscaping, or equipment and facilities would be vulnerable to impacts during project construction. Nests, nestlings, and eggs of native birds are protected by the Migratory Bird Treaty Act (MBTA) and Fish and Game Code sections 3503 and 3513. If initial demolition site grading or vegetation removal in landscaped areas were to occur during nesting season, then it could destroy bird nests, including eggs or nestling birds. In addition, initiation of noisy construction activities during the breeding season could disturb breeding birds and cause nest failure.

Staff recommends conducting a preconstruction active nest survey within and around the perimeter of the ESEC site, which includes the proposed ESPFM site, and, if determined necessary, monitoring active nests during demolition and construction activities if it is determined that active nests would be disturbed by the proposed ESPFM activities. Condition of Certification **BIO-17 (Pre-Construction Nest Surveys and Impact Avoidance and Minimization Measures for Breeding Birds)**, provides detail on survey timing and recommendations to avoid disturbance to active nests and ensure compliance with the MBTA. With implementation of Condition of Certification **BIO-17**, no significant impacts to nesting birds would result from proposed demolition and construction activities.

Wildlife could become entrapped in open trenches during construction, especially if trenches remain open during inactive construction periods. Staff recommends Condition of Certification **BIO-16 (Impact Avoidance and Minimization Measures)**, which would require exclusion measures for open trenches (e.g., fencing or covering), inspection of trenches prior to resuming construction activities each day, and installation of escape ramps so that animals that fall in the trench could escape. Implementation of this measure would mitigate adverse impacts to wildlife from entrapment. In addition, best management practices (BMPs) related to use of non-toxic soil bonding and weighting agents, reporting hazardous spills to the Designated Biologist, proper disposal of trash and food-related waste, and pesticide management to address potential impacts to wildlife and plants are included in **BIO-16**.

An analysis of impacts to wildlife from noise and lighting is presented under “General Construction and Demolition Impacts”, below.

Demolition and Construction Impacts to Special-Status Plant Species

Special-status plants recorded historically within one mile of the proposed ESPFM site include Orcutt’s pincushion (CRPR 1B.1), beach spectaclepod (ST, CRPR 1B.1), and Coulter’s goldfields (CRPR 1B.1). These occurrences are all presumed or considered likely extirpated. Special-status plants recorded within one mile of the preferred offsite laydown area include southern tarplant (CRPR 1B.1), Coulter’s goldfields, and San Bernardino aster (CRPR 1B.2). Populations of Coulter’s goldfields and San Bernadino aster are consider likely extirpated while the southern tarplant occurrence is considered extant but threatened by channel maintenance (see **Biological Resources Table 2)**. The existing conditions in the proposed project area and preferred offsite laydown area are not likely to support any special-status plants, and none have been recorded at the sites. The proposed ESPFM site is within the ESEC site, an existing operating power generating plant, and the preferred offsite laydown area and other laydown and parking

areas are located within existing industrial sites or parking areas and are entirely developed with no natural habitat. Rare plants do not occur in the areas immediately adjacent to the ESEC site but do occur near the preferred offsite laydown area; however, their introduction into the project site or the offsite laydown area would be unlikely and vegetation is limited to landscaped or unpaved areas. Ongoing maintenance of landscaped areas, including weed eradication, would prevent any rare plants that were introduced onto the site from persisting. Therefore, direct impacts to special-status plants from demolition and construction would not occur and no mitigation is proposed.

Demolition and Construction Impacts to Special-Status Wildlife

Wildlife habitat in the project area has been significantly fragmented by urban development. The existing ESEC site and proposed ESPFM site, the preferred offsite laydown area in the city of Gardena, and the offsite parking areas near the ESPFM site are located in developed areas; therefore, there would be no direct impacts resulting from disruption of wildlife movement, or habitat loss or fragmentation. The potential for the monarch butterfly to potentially roost in landscaping trees on the ESPFM site is low and the species has not been recorded previously at the site. Therefore, impacts to monarch butterflies are less than significant and mitigation is not proposed.

Although most special-status wildlife species are not expected to occur at the proposed project site or offsite parking and laydown areas, several may forage, roost, or breed at nearby beaches, dunes, and marine areas including the western snowy plover, California brown pelican, California least tern, and the El Segundo blue butterfly. Direct impacts could occur to special-status wildlife in the beaches adjacent to and near the proposed ESPFM project during demolition and construction. These include disturbance from noise, and lighting. Indirect impacts could also occur to special-status wildlife during demolition and construction such as degradation of habitat from invasive weeds, stormwater runoff, or groundwater contamination and potential impacts from increased risk of predation. These impacts are discussed under “General Demolition and Construction Impacts”, below.

Demolition and Construction Impacts to Jurisdictional Wetlands and Waters

The proposed ESPFM project would not result in direct loss or fill of any jurisdictional wetlands as there are none present within the project area. The proposed ESPFM would require work within jurisdictional water to plug the intake/outfall tunnels for Units 3 and 4 (designated as Discharge 002) on the ESEC site east of the sea wall. The ocean water in the forebay is hydrologically connected to Santa Monica Bay, which is a traditional navigable water and therefore considered a waters of the U.S. and under the jurisdiction of the USACE. The in-plant forebay is a holding pool for waters exiting or entering the plant from Outfall 002.

All work to plug the intake/outfall tunnels (Discharge 002) would take place on the ESPFM site within the screenwell/forebay portion of the cooling water intake structure in order to decommission the once-through cooling facilities for Units 3 and 4 as part of the ESPFM amendment. The plug would be designed and constructed similar to those for

the Discharge 001 tunnels (NRG 2013). NRG prepared a pre-construction Notification for Nationwide Permit (NWP) 3 and submitted to USACE under Section 404 of the Clean Water Act for the plugging of the Discharge 001 tunnels and were subsequently issued a permit authorization for use of the NWP 3 from USACE. For the plugging of Discharge 001, work implemented by NRG included construction of a bulkhead framework, construction of a concrete bulkhead, and pouring of concrete into the bulkhead to plug the tunnels. The NWP 3 covers maintenance activities that include the repair, rehabilitation, or replacement of any previously authorized, currently serviceable structure, or fill, or of any currently serviceable structure or fill. However, NRG indicated in its Petition to Amend for the ESPFM that they anticipated this activity would be covered by a NWP 7 which covers activities related to the construction or modification of outfall structures and associated intake structures. Based on discussions with USACE representatives, either NWP applies for maintenance as long as a NPDES is a permit condition, and a NWP 7 is required if there would be new construction in addition to maintenance. The NWP 3 requires a Pre-Construction Notification (PCN) if it falls under activities described in NWP 3(b), while a NWP 7 requires a PCN in all cases. Based on discussion between staff and USACE representatives, a NWP 7 appears to be the more appropriate permit for the action (Rogers, pers comm. 2014) Upon completion of the plugging operation the forebay would be dewatered and treated and then the treated water discharged to Outfall 002 to the ocean under the existing NPDES CA0001147 Order No. 00-084 as proposed by **SOIL&WATER-3,** which would require the project owner to continue coverage through project operation. Until a permit application is submitted by the project owner to USACE, it is undetermined whether both Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act permits would be required. Both permits are processed by USACE under the same permit application.

Based on discussions with USFWS representatives, no federally-listed species under USFWS jurisdiction would be affected by the proposed action as there are no habitats occupied by any federally-listed terrestrial species that could be affected by the plugging of the intake/outfall tunnels (Medak, C. per comm. 2014b). Critical habitat for the western snowy plover is located north of the ESPFM project area; however, there would be no direct or indirect impact to the species or its habitat from this activity. Therefore, formal or informal consultation between USACE and the USFWS pertaining to endangered and threatened species requirements would not be necessary. In addition, the USACE would not likely need to consult with the NMFS regarding the need to implement measures to protect essential fish habitat as required under the Magnuson-Stevens Fishery Conservation and Management Act as consultation was already completed for the issuance of the Nationwide Permits. The activities permitted under the Nationwide Permits would be short-term and temporary and would have minimal individual and cumulative adverse environmental effects on federally-listed marine species. In addition, it is unlikely that the action may affect federally listed aquatic threatened and/or endangered species under the jurisdiction of NMFS as the work within the forebay and subsequent dewatering would follow the applicable General and Regional Conditions as part of use of the NWP required to minimize both direct and indirect adverse environmental effects which includes minimizing impacts on aquatic life movements, spawning habitat, and migratory bird breeding areas as well as consulting

with appropriate federal agencies if the proposed activities may affect federally listed species.. The USACE may require special conditions as part of their authorization to use the NWP. However, the determination of whether additional consultation with NMFS is necessary is ultimately the responsibility of USACE.

In addition, Clean Water Act Section 401 Water Quality Certification from the LARWQCB would be necessary in order to acquire the NWP from the USACE. Section 401 certification is required whenever a federal permit issued under Section 404 by the USACE. Based on discussions with LARWQCB, the certification would likely be issued within 60 days of a complete application from the project owner. Based on the activities conducted for Discharge 001, activities for plugging of Discharge 002 would not be a complex activity to permit (Nye, L.B. per comm. 2014).

Staff's recommended Condition of Certification **BIO-11 (U. S. Army Corp of Engineers Permit)**, **BIO-12 (Federal Biological Opinion)**, and **BIO-13 (Los Angeles Regional Water Quality Control Board Certification)** provide for acquiring all necessary permits from the USACE and LARWQCB and implementing all terms and conditions included in these permits. With implementation of Conditions of Certification **BIO-11**, **BIO-12**, and **BIO-13**, the proposed project demolition or construction activities would have no significant impacts on jurisdictional waters.. Any terms and conditions required under permits will be incorporated into the BRMIMP and implemented.

The proposed ESPFM site and the preferred offsite laydown area are adjacent to jurisdictional wetlands and waters. Indirect impacts to local surface waters, may result if construction contaminants, sediment, or untreated stormwater effluent from the proposed project area enter these sensitive areas. The project owner has committed to implementing Best Management Practices (BMPs) to control site runoff during construction activities in accordance with the project's Stormwater Pollution Prevention Plan (SWPPP); this is included as a requirement of Condition of Certification **SOIL&WATER-1**. In addition, groundwater dewatering may be necessary during demolition (ESPLLC 2000a). In order to avoid significant impacts to onsite and offsite water resources or sensitive environmental receptors from pumping of contaminated groundwater, staff is recommending Condition of Certification **SOIL&WATER-5.** See the **Soil and Water Resources** section for a complete analysis of groundwater dewatering. With implementation of these measures, direct and indirect impacts to water quality and marine habitats would be less than significant.

General Demolition and Construction Impacts

Noise

Noise from demolition and construction activities could discourage sensitive wildlife from foraging and nesting near the proposed project area due to interference with communication, disturbance or disruption of activities, or startling from loud noises. Many bird species rely on vocalizations during the breeding season to attract a mate within their territory, and noise from construction could adversely affect nesting behavior and other activities. Special-status species potentially occurring at the adjacent Dockweiler State Beach may be impacted by demolition and construction noise. The onshore areas support special-status species including western snowy plover

(*Charadrius alexandrinus nivosus*; federally listed threatened). There is USFWS designated critical habitat for western snowy plover, specifically Critical Habitat Subunit 45C, located approximately 800 feet northwest of the proposed location for the power blocks for the ESPFM (Units 9, 10, 11 and 12). California least tern (*Sterna antillarum browni*; federally and state-listed endangered), and California brown pelican (*Pelecanus occidentalis californicus*, state fully protected) may forage in shallow coastal waters such as those located offshore of Dockweiler State Beach located approximately 500 feet from the proposed location for the power blocks for Units 9, 10, 11 and 12. Other bird species observed foraging in the intertidal zone at Dockweiler State Beach adjacent to the existing ESEC site include sanderlings (*Calidris alba*) and black bellied plovers (*Pluvialis squatarola*). Other protected areas are further than one mile from the project area so no additional consideration is given in this noise impact analysis.

Each of the aforementioned locations with noise-sensitive biological resources is listed in **Biological Resources Table 3**, below, along with ambient noise levels and estimated construction noise levels at each location.

Biological Resources Table 3
Summary of Noise Levels at Locations with Noise-sensitive Biological Resources

Location	Ambient Noise Level (average Leq)[1]	Approximate distance from Power Blocks 9-12 (feet)	Demolition Noise Level[2]	Construction Noise Level[2]
Dockweiler State Beach (on shore near western snowy plover critical habitat)	64.7 dBA	800	65 dBA[3]	Average:65 dBA Steam blows:62dBA
Dockweiler State Beach (immediately offshore)	64.4 dBA	500	65 dBA	Average:69 dBA Steam blows: 66 dBA

1Estimated based on data from short-term monitoring stations (ST-5 and ST-2) included in the Post-Construction Operational Sound Level Study for Condition of Certification **Noise-6** for El Segundo Power Redevelopment (00-AFC-14C) (NRG 2013).
[2] Calculated by noise staff based on EPA estimates of typical construction equipment and operation noises (EPA 1971).
[3] A-weighted decibels

Past studies have shown that noise levels over 60 dBA may affect the behavior of certain bird species and could interfere with acoustic communication (e.g., Dooling and Popper 2007). Since publication of the PSA, staff have considered information indicating that the A-weighted scale for measurement of noise levels may not be the most appropriate to determine the impacts of noise frequencies on birds, but currently there is no determination of a more appropriate scale (CEC 2014f). It is staff's opinion that excessive noise would have an impact on birds. Noise may affect birds in several ways, including reducing reproductive success; raising the level of stress hormones; interfering with sleep; cause permanent injury to the auditory system; and interfering

with acoustic communication by masking important sounds, such as an approaching predator (Halfwerk et al 2011; Dooling 2006; Kight and Swaddle 2011). Many bird species rely on vocalizations during the breeding season to attract a mate within their territory. Francis et al. (2009) showed that noise alone reduced nesting species richness and led to a different composition of avian communities. Although some birds are able to shift their vocalizations to reduce the masking effects of noise, when shifts did not occur or were insignificant, masking could impair signaling and listening capabilities necessary for successful communication and survival (Barber et al. 2010).

Ambient noise levels measured by the project owner as part of post-construction studies for the previous amendment were approximately 64 dBA at the northwest corner of the existing ESEC site adjacent to Units 5, 6, 7, and 8 (NRG 2013). One monitoring station (ST-5) is immediately adjacent to Critical Habitat Subunit 45C for snowy plover and along the boundary adjacent to Dockweiler State Beach and the bike path (NRG 2014a). The second monitoring station (ST-2) is adjacent to the ESEC site approximately 500 feet from the intertidal zone. Noise levels immediately offshore of Dockweiler State Beach may be higher than 64.4 dBA due to additional noise from tidal action at the intertidal zone. This demonstrates that ambient noise levels along the western boundary of the ESEC site and closet to sensitive biological receptors are already above 60 dBA. Ambient noise sources include surf and wind as well as noise resulting from human activities such as the operation of the existing ESEC facility, operational noise from other industrial sites located adjacent to the ESEC site, roadway traffic, air traffic from LAX, and recreational activities.

Demolition and construction noise would occur over three years in close proximity to Dockweiler State Beach. The average demolition and construction noise level is based on EPA estimates of typical construction equipment and operation noises (EPA 1971). As described above, average levels of demolition and construction noise would continuously be above 60 dBA along the western boundary of the proposed ESPFM site at Dockweiler State Beach; however ambient noise levels are already approximately 64 dBA at the western boundary of the ESEC site. Demolition and construction noise would not exceed the ambient noise levels near western snowy plover critical habitat or near the intertidal zone at Dockweiler State Beach. It is expected that birds present in these areas have acclimated to elevated noise. In compliance with city of El Segundo noise control ordinances, Condition of Certification **NOISE-6** restricts construction noise to 65 dBA at the ESEC site boundary, except for short duration increases up to 85 dBA. Since ambient noise levels near western snowy plover critical habitat are already approximately 65 dBA (64.7 dBA), there would be no net increase in noise at this biologically sensitive area beyond the level required by Condition of Certification **NOISE-6**.

For the ESPFM, steam blows are the loudest proposed construction activity. High pressure steam blows, if un-silenced, can typically produce noise levels as high as 129 dBA at a distance of 50 feet; see the **Noise and Vibration** section for a complete analysis of steam blows. Use of a quieter steam blow process, referred to as “low-pressure steam blow,” results in noise levels that reach about 86 dBA at 50 feet. Steam blows for ESPFM would be performed in compliance with the existing Condition of

Certification **NOISE-4** which requires low-pressure steam blows. This noise level would be 62 dBA near western snowy plover critical habitat. However, at the intertidal zone at Dockweiler State Beach where birds are known to forage, the average construction noise level would be 69 dBA, with steam blow averaging 66 dBA The actual ambient noise levels immediately offshore of Dockweiler State Beach may be higher than the estimated ambient level due to additional noise from tidal action at the intertidal zone. . Steam blows would be an intermittent noise that would be particularly startling and disruptive to wildlife, however steam blows would be temporary and typical occur during equipment testing and last two or three minutes each and are performed several times daily over a period of two or three weeks. The resultant noise impacts to wildlife would be significant without mitigation. To mitigate noise impacts to wildlife, construction and demolition noise must not exceed noise levels allowed by the conditions of certification included in the **Noise and Vibration** section of this FSA, at the following noise-sensitive receptors: Pacific Coast Western Snowy Plover Critical Habitat Subunit CA 45C at Dockweiler State Beach and intertidal zone at Dockweiler State Beach. In addition, if noisy construction activities are determined by the Designated Biologist or Biological Monitors to be disturbing nesting birds in the project area, construction and demolition noise must be reduced within an appropriate buffer for the species To achieve this, the project owner could implement a combination of the following noise-reduction measures:

- temporary and permanent noise barriers, such as sound walls;
- reduction of speed limits;
- prohibition of “jake-breaking;”
- replacement and updating of noisy equipment;
- moveable task noise barriers;
- queuing trucks to distribute idling noise;
- locating vehicle access points and loading and shipping facilities away from noise-sensitive receptors;
- reducing the number of noisy construction activities occurring simultaneously;
- placing noisy stationary construction equipment in acoustically engineered enclosures and/or relocating them away from noise-sensitive receptors; and/or
- reorienting and/or relocating construction equipment to minimize noise at noise-sensitive receptors, pursuant to Condition of Certification **NOISE-6.**

These are typical industry standard measures that would be implemented as part of the requirements of **NOISE-6 (Compliance with Noise Standards)** that recommends the project design and implementation shall include appropriate noise mitigation measures. In addition, **NOISE-8** (**Construction/Demolition Schedule)** would require that noise restrictions be implemented during any nighttime construction. In order to minimize noise impacts to breeding birds potentially nesting in ornamental trees surrounding the ESPFM site, staff recommends Condition of Certification **BIO-17**. Condition of Certification **BIO-17** would require a qualified biologist to monitor any bird nest locations exposed to excessive construction noise until the biologist determines that nestlings

have fledged. Activities that might disturb nesting activities (e.g., excessive noise, exposure to exhaust), would be prohibited within the buffer zone until such a determination is made. Buffer zones could range from 250 feet to 500 feet based on the particular sensitivity of a species to disturbance and the location of the nest. Buffers smaller than 250 feet may be acceptable depending on the species. Since publication of the PSA, staff has deleted the requirement in **BIO-17** that requires noise be reduced to ambient levels, or no more than 60 dBA in areas where the ambient noise levels are below 60 dBA since the specific level at which birds are disturbed by excessive noise is currently undetermined. With implementation of **BIO-17**, impacts to nesting birds from proposed project construction noise would be less than significant. For a complete analysis of construction noise impacts, refer to the **Noise and Vibration** section of this FSA.

Lighting

ESPFM demolition and construction activities would typically occur during daylight hours, Monday through Saturday; however, during some construction periods and during the start-up phase of the project, construction activities would continue 24 hours a day and seven days a week. Bright lighting at night could disturb the nesting, foraging, or mating activities of wildlife in the adjacent beaches and make wildlife more visible to predators. Night lighting could be disorienting to migratory birds and, if placed on tall structures, may increase the likelihood of collision. Although existing operations at the ESEC site and traffic on the Vista Del Mar provide an elevated ambient level of lighting to which local species have acclimated, potentially significant impacts to sensitive wildlife from increased night lighting could occur.

If night construction were required, the project owner expects that requirements from the 2010 Commission Decision for the 2007 dry-cooling amendment would be applicable as included in Condition of Certification **VIS-8**, including requirements to use task-specific lighting to the extent practicable, shield and direct lighting onsite, and use switched lighting where possible (NRG 2012). These measures are included in **VIS-8** being recommended by Visual Resources staff (refer to the **Visual Resources** section of the FSA). With implementation of these measures, impacts to wildlife from construction night lighting would be less than significant.

Stormwater Runoff

There are no creeks, drainages, wetlands, or other aquatic resources on the project site, offsite laydown area, or offsite parking areas. However, beaches and marine habitat adjacent to the proposed ESPFM site could be impacted from stormwater runoff during demolition and construction if appropriate measures are not taken to prevent water from draining off site. Toxic materials washed from the site into adjacent marine areas can injure or kill wildlife and vegetation, and degrade habitat. During construction and demolition, the existing stormwater collection system would collect process stormwater from the project site and route it to the oil/water separator before discharge to the Pacific Ocean via an existing NPDES permitted outfall.

Staff is recommending Condition of Certification **SOIL&WATER-1**, which would require the project owner to develop and implement a site-specific construction SWPPP. With

implementation of these measures and the project owner's commitment to the impact minimization measures listed above, project impacts to biological resources from stormwater runoff would be less than significant.

Dust Suppression

Due to the long industrial history of the ESEC site, implementation of the ESPFM project would not require much additional soil disturbance for the new facilities. However, some small losses in topsoil are expected during construction and operation from wind and water erosion. During construction dust suppression would require application of potable water to control wind-borne transport of dust. Application of potable water for dust control could result in the ponding of water on site which may attract crows, ravens, and gulls and other avian species to the site for the water scavenging opportunities. Crows, ravens, and gulls are all known predators of California least tern and western snowy plover chicks, both federally listed species which potentially nest in the vicinity at Dockweiler State Beach. Impacts to California least tern and western snowy plover from dust abatement could be potentially significant without mitigation. Condition of Certification **BIO-16** requires using the minimal amount of water needed for dust abatement, managing food-related waste, and training workers on environmental awareness. With implementation of **BIO-17**, impacts to nesting birds would be less than significant.

OPERATION IMPACTS AND MITIGATION

Noise

The proposed ESPFM is on an industrial site and is near other industrial land uses and Vista Del Mar. However, it is also located adjacent to sensitive biological resources including beaches and marine areas with the potential to support threatened and endangered birds. The existing ESEC, urban development, and roadways in the area are existing sources of noise.

Excessive noise masks auditory cues from other birds, including potential mates, and approaching predators. Chronic exposure to excessive noise has been demonstrated to negatively affect foraging behavior, reproductive success, population density, and community structure (Habib et al. 2007; Bayne et al. 2008; Barber et al. 2010).

Based on the project owner's Post-Construction Operation Sound Level Study for Condition of Certification **NOISE-6** for the existing ESEC site, ambient noise levels adjacent to the project site are estimated to currently be approximately 65 dBA. Staff is recommending Condition of Certification **NOISE-6** for the ESPFM, which would require implementation of plant noise mitigation based on the results of noise measurements at short term monitoring stations (ST) ST-1 or ST-12. The short term monitoring station ST-1 is located at the northwest corner of the existing ESEC site adjacent to the western snowy plover, Critical Habitat Unit 45C and the bike path. If noise measurements for the ESPFM indicate that the ambient noise level has increased by more than 5 decibels due to facility operation, as compared with the baseline noise measurements in 2000, which was determined to be approximately 60.4 dBA, the project owner would implement mitigation measures to reduce the noise at those

locations to comply with the Municipal Code of the city of El Segundo. Therefore, noise at ST-1 may not exceed 65.4 dBA and it would likely attenuate to less than 60 dBA at Critical Habitat Unit 45C. Because the operational noise level for the ESPFM is required to be similar to ambient noise level for the ESEC site, operational noise impacts to western snowy plover and other wildlife at Dockweiler State Beach would not occur as these species are likely acclimated to the current ambient noise level. With implementation of Condition of Certification **NOISE-6 (Compliance with Noise Standards)**, this impact would be less than significant. Refer to the **Noise** section of the FSA for the full text of this condition.

Lighting

The existing ESEC, other industrials sites located near the proposed ESPFM, and vehicles traveling on Vista Del Mar provide an elevated ambient level of light to which local wildlife have adapted. However, excessively bright lighting at night could disturb the nesting, foraging, or mating activities of wildlife at the adjacent beaches and make wildlife more visible to predators. Also, night lighting could be disorienting to migratory birds and, if placed on tall structures, may increase the likelihood of collision, as discussed below.

To minimize backscatter of light to the sky and ensure that lighting does not obtrude beyond the project site, staff recommends Conditions of Certification **VIS-6** and **VIS-7** (refer to the **Visual Resources** section of the FSA for the full text of these conditions). In addition, **VIS-6** and **VIS-7** require that all lighting be of minimum necessary brightness consistent with worker safety, and wherever feasible and safe, be kept off when not in use, including administration office interior lighting.

In addition, staff recommends **BIO-16** which requires that FAA visibility lighting would use only strobed, strobe-like or blinking incandescent lights, preferably with all lights illuminating simultaneously. This type of lighting is less attractive to night-migrating birds and would minimize collisions with project features. With implementation of Conditions of Certification **VIS-6 (Project Lighting), VIS-7 (Site Lighting),** and **BIO-16 (General Impact Avoidance and Minimization Measures)**, impacts from operation lighting would be less than significant.

Avian Collision and Electrocution

The adjacent beaches and marine areas provide habitat for resident and migratory birds because of foraging and breeding opportunities and proximity to the Pacific Ocean. This concentration of birds creates the potential for direct impacts through collision or electrocution with proposed ESEC facilities and appurtenant structures including exhaust stacks. No new transmission lines and transmission support structures are proposed for the ESPFM.

Birds can collide with transmission lines, exhaust stacks, and other structures associated with the proposed project, causing injury or mortality. Bird collisions with power lines and structures generally occur when a power line or other structure transects a daily flight path used by a concentration of birds and these birds are traveling at reduced altitudes and encounter tall structures in their path (Brown 1993).

Collision rates generally increase in low light conditions, during inclement weather, during strong winds, and during panic flushes when birds are startled by a disturbance or are fleeing danger. Collisions are more probable near wetlands, within valleys that are bisected by power lines, and within narrow passes where power lines run perpendicular to flight paths (APLIC 2012).

Although collision may occur, it is not likely that bird mortality due to collision with ESPFM facilities would significantly reduce the population numbers of any bird species or that the reduction in numbers within any population would impair its function within the local ecosystem. The proposed ESPFM exhaust stacks would be much shorter than 350 feet (the height above which is considered dangerous to migrating birds), and shorter than the existing built environment (e.g., Units 5 through 8 and Units 3 and 4 (to be demolished) exhaust stacks). The reduction in height of the exhaust stacks would result in a lower risk of bird collision with this project feature compared with existing conditions. See the **Visual Resources** section for a complete discussion of stack heights.

The proposed ESPFM project would connect to the regional electrical grid using the existing SCE 230-kV switchyard located on a parcel owned by SCE within the existing El Segundo Generating Station site. No new offsite or onsite transmission lines are proposed. Therefore, no new direct and indirect impacts to birds from collision with structures are expected to occur from the ESPFM. Direct and indirect impacts to birds from collision with structures are expected to be minimal and consistent with baseline conditions, given the project location and existing power lines, tall structures, and facilities on the site.

Stormwater Runoff

Stormwater runoff from open areas on the proposed ESPFM site during operation would be collected in yard drains that will route stormwater to an oil/water separator prior to discharge into the Pacific Ocean via Outfall 002. Stormwater discharge would require coverage under this site's existing discharge permit, NPDES CA0001147 Order No. 00-08. For more information on water quality impacts, please see the **Soil and Water Resources** section of the FSA.

There are no creeks, drainages, wetlands, or other aquatic resources on site. Adjacent beaches and associated marine habitat could be impacted from stormwater runoff if appropriate measures are not taken to prevent water from draining off site. Toxic materials washed from the site into adjacent sensitive areas can injure or kill wildlife and vegetation, and degrade habitat. Staff's proposed Condition of Certification **SOIL&WATER-3** which would require the project owner to continue coverage under NPDES CA0001147 Order No. 00-084 through project operation, and would reduce project impacts from stormwater to less than significant. In addition, Best Management Practices (BMPs) from the project SWPPP would be implemented during all phases of the proposed project to control stormwater runoff. As required by staff's proposed Condition of Certification **BIO-16** (Impact Avoidance and Minimization Measures), only certified weed free materials will be used for erosion control. With implementation of these measures and BMPs and associated monitoring activities included in NPDES

CA0001147 Order No. 00-084, impacts to water quality and associated impact to biological resources from operation of the proposed ESPFM would be less than significant.

Air Emissions – Nitrogen Deposition

Nitrogen deposition is the input of nitrogen oxide (NO_x) and ammonia (NH_3) derived pollutants, primarily nitric acid (HNO_3), from the atmosphere to the biosphere. Nitrogen deposition sources are primarily vehicle and industrial emissions, including power plants. Mechanisms by which nitrogen deposition can lead to impacts on sensitive species include direct toxicity, changes in species composition among native plants, and enhancement of invasive species (Fenn et al. 2003; Weiss 2006). The increased dominance and growth of invasive annual grasses is especially prevalent in low-biomass vegetation communities that are naturally nitrogen-limited; such vegetation communities that occur in the project vicinity include intertidal salt marshes, intertidal wetlands, freshwater marsh/wetlands, coastal dunes, and coastal dune scrub (Weiss 2006).

Designated critical habitat for western snowy plover and USFWS designated recovery units for the El Segundo blue butterfly occur in the vicinity of the ESPFM (see **Biological Resources Figure 1** for the location of designated critical habitat). In addition, USFWS has identified areas within the USFWS recovery units for El Segundo blue butterfly as either occupied, potentially restored, and restored. **Biological Resources Figure 2** shows these areas in the project vicinity. Protected areas and preserves also occur in the region, including the Ballona Creek Wetlands Preserve and a California least tern breeding colony. These protected areas support state and federally listed species including the Belding's savannah sparrow (state-listed endangered) and California least tern (federally and state-listed endangered). **Biological Resources Figure 1** shows protected and preserved areas in the project vicinity.

Nitrogen deposition, primarily from industrial and vehicle emissions, artificially fertilizes the soil and creates better conditions for non-native species to persist and to ultimately displace the native species, resulting in type conversion (conversion of one habitat type to another). Excessive nitrogen deposition is strongly correlated with the growth of non-native vegetation (Huenneke et al. 1990; Inouye and Tilman 1995; Weiss 1999; Bowman and Steltzer 1998; Brooks 2003) and field studies have found that nitrogen fertilization in sites with elevated nitrogen deposition will enhance grass invasion (Rillig et al 1998; Brooks 2003). Several recent studies have attempted to quantify the critical load or rate at which nitrogen deposition begins to result in adverse effects to nitrogen-sensitive ecosystems. Studies in the United Kingdom suggest that the critical load ranges from 10 to 20 kilograms of nitrogen per hectare per year (kg/ha/yr) for mobile and fixed sand dune ecosystems (Jones et al. 2004; Plassmann et al. 2009). Fenn et. al. (2003) counter that estimated nitrogen deposition thresholds for ecological effects for other geographic regions are frequently not applicable to the western United States. Research conducted in the South San Francisco Bay area on grasslands in nutrient-poor serpentinic soils indicates that intensified annual grass invasions can occur in areas with nitrogen deposition levels of 11 to 20 kilograms per hectare per year

(kg/ha/yr), with relatively limited invasions at levels of 4 to 5 kg/ha/yr (Weiss 2006). Critical loads in habitats affected by ESPFM emissions range from 10 to more than 400 kg/ha/yr of nitrogen (Pardo et al. 2011; Bobbink et al 2002). However, critical loads are difficult to determine for a variety of reasons, including a wide range of values that are reported in the literature for various vegetation types; and data from regions that are not comparable to the project region in terms of climate regime, other unrelated disturbance and stressors on target habitats, and other confounding factors.

An Energy Commission Public Interest Energy Research study modeled total nitrogen deposition throughout California (Tonneson et. al. 2007); results showed that in 2002 most of California experienced elevated rates of annual nitrogen deposition, especially near urban areas. In 2002, baseline nitrogen deposition rates in protected areas in the region ranged from 1.65 to over 15 kg/ha/yr. Baseline nitrogen deposition rates in critical habitat and recovery units in the region were estimated to be as follows (GIS data from Tonneson et. al. 2007).

- Western snowy plover critical habitat: 6.19 to 23.35 kg/ha/yr
- El Segundo blue butterfly recovery units: 2.21 to 23.35 kg/ha/yr

In response to data requests 57 through 60, the project owner declined to conduct modeling of nitrogen deposition impacts for the ESPFM but provided Air Quality staff with the necessary files to conduct an independent analysis of potential nitrogen impacts using American Meteorological Society/Environmental Protection Agency Regulatory Model known as AERMOD (Refer to **Biological Resources – Appendix 1 Nitrogen Deposition Analysis**). Staff modeled the baseline predicted ESEC nitrogen deposition for the previously approved facility (the remaining portion of unit 3, unit 4, and units 5 through 8) using AERMOD. Staff found the nitrogen deposition impacts from the ESPFM units (units 9 through12) in addition to the ESEC units (units 5 through 8) would be lower than those from the remaining portion of unit 3 (based on the remaining megawatts to be replaced), unit 4, and units 5 through 8, more details are discussed in the **Air Quality** section). Air Quality staff determined that while AERMOD is the best available model compared to other available models such as CALPUFF, it is a conservative model that overestimates the predicted ESPFM nitrogen deposition impacts. Staff has provided additional analysis regarding the conservative nature of AERMOD impact analysis as well as other assumptions which further overestimate impacts in the nitrogen deposition analysis. Staff's assessment concluded that the project's modeled nitrogen deposition using AERMOD were overestimated by 10-fold when compared to the results of the CALPUFF model, based on conservatisms incorporated into the AERMOD modeling tool. It also concluded that the baseline values at present are likely to be half of what they were in 2002 (the year of the baseline data used in staff's original nitrogen deposition analysis). Please see **Biological Resources – Appendix 1** for additional information.

Staff considered protected areas and designated critical habitat within the 6-mile radius to be potentially sensitive to nitrogen deposition from the ESPFM. It has been staff's past experience that by the time the plume has traveled this distance, in-plume concentrations become indistinguishable from background concentrations. Within the 6-mile radius, staff examined the GIS-data of baseline nitrogen deposition from the

Energy Commission's 2007 study (Tonneson et. al. 2007); see **Biological Resources Figures 3**. In determining whether the project's nitrogen emissions could cause significant impacts to sensitive habitats within the 6-mile radius, staff relied on critical load ranges for these habitats. Where a range for critical load was reported, the lowest value of the range was used as a conservative approach. Since the nitrogen deposition plume extends 6 miles east of the project, it encompasses several different baseline levels of nitrogen deposition as illustrated in **Biological Resources Figures 3**. The ESPFM's nitrogen deposition levels also vary across listed species habitat areas. In order to determine if critical load was exceeded, total predicted nitrogen deposition was calculated by adding the background data, based on Tonneson et. al. 2007 to the predicted total ESEC nitrogen deposition for the future scenario: the proposed ESPFM (Units 9 through 12) and the existing ESEC (Units 5 through 8).

Based on a review of the baseline information and the results of modeling conducted by Air Quality staff, vegetation-specific critical loads for nitrogen deposition would not be exceeded in any locations with salt marsh habitat in the ESPFM project vicinity, where the critical load ranges from 63 to 400 kg/ha/yr. This includes protected areas for the state and federally-listed Belding's savannah sparrow. In addition, the critical load for coastal dunes, which ranges from 10 to 20 kg/ha/yr, would not be exceeded within most areas of critical habitat for western snowy plover in the ESPFM project vicinity. However, in critical habitat areas for western snowy plover where the critical load was exceeded it was determined that there would be no significant impacts to western snowy plover as these areas are not subject to weed invasions due to the ongoing anthropomorphic use and regular maintenance of the beaches (Medak, pers. comm. 2014a). The critical load for coastal dunes would not be exceeded within the area near Marin del Rey where a California least tern colony is established.

The modeling showed that vegetation-specific critical loads for nitrogen deposition were exceeded in limited areas of occupied and potential restored habitat for El Segundo blue butterfly south and east of the ESPFM project region based on the 2002 data; however, there has been a decreasing nitrogen emission inventory trend (an overall reduction of over 50 percent from 2002 to 2014),(Refer to **Biological Resources – Appendix 2** for additional details). Because of these downward trends staff assumes that while vegetation-specific critical loads for nitrogen deposition in these areas may have previously been exceeded, these areas are currently likely to be within the lower range of critical load for coastal dunes and most areas may be lower than critical load. In addition, as discussed further in **Biological Resources – Appendix 2,** implementation of the Regional Clean Air Incentives Market or RECLAIM by the South Coast Air Quality Management District (SCAQMD) requires ESPFM and other similar projects to purchase RECLAIM Trading Credits (RTCs) to offset their annual NOx emission increase in a 1-to-1 offset ratio. As a result, any new stationary source like ESPFM would not result in a net increase in NOx emissions basin wide. Therefore, baseline nitrogen from NOx would not change due to NOx emissions from ESPFM.

Although non-native plant invasions have impacted the coastal dune habitat in the region, the invasions are primarily due to past anthropomorphic disturbance. Native species including beach sand verbena (*Abronia umbellata*) and seacliff buckwheat were common on the local beaches and dunes in the range of El Segundo blue butterfly until

iceplant (*Carpobrotus edulis*) was planted extensively, including historical planting of non-native iceplant for erosion control by both Caltrans and the California Conservation Corps. Non-native iceplant reproduces both vegetatively and by seed and flowers almost year round throughout its range and seed production is high, with hundreds of seeds produced in each fruit (Cal-IPC 2013). It is highly invasive where introduced and likely would be established regardless of any additional nitrogen deposition as it is established throughout much of the coastal dunes within El Segundo blue butterfly's range. In addition, nitrogen deposition impacts are primarily associated with invasive exotic annual grasses negative effects on annual forbs (Weiss 2006). The host plant for the El Segundo blue butterfly, the seacliff buckwheat, is a perennial shrub and once established would likely not be crowded out by any non-native grasses that may also be present due to its height and robust growth form. Non-native grasses will likely decline as the native shrubs become established (UWG 2004). The primary concern regarding native plants, including seacliff buckwheat, in recently restored areas such as the Beach Bluffs Restoration in the Torrance Recovery Unit, is competition from non-native perennials including iceplant and Bermuda grass (UWG 2004).

Based on the numerous factors discussed above, including the conservative nature of the nitrogen deposition modeling, reductions in background nitrogen emissions, and the continuing decreasing trend in nitrogen emissions inventory, reductions in emissions for the future operating scenario of the ESEC site, use of RECLAIM offsets, and the nature of current threats to the El Segundo blue butterfly, staff concludes that the best available information does not support a conclusion of significant nitrogen deposition impacts from the project and that the ESPFM's impacts from nitrogen deposition to federally and state-listed species are less than significant. Since operation of the proposed project would not result in significant indirect impacts to state or federally-listed species from nitrogen deposition, no mitigation is proposed. It is staff's opinion that no take of listed species would occur, but the ultimate determination of federal ESA compliance will be made by the United States Environmental Protection Agency (USEPA) in coordination with USFWS upon initiation of ESA consultation and issuance a Biological Opinion, if required.

Although the federal endangered El Segundo blue butterfly (*Euphilotes battoides allyni*) would not be impacted by the ESPFM, it could benefit from vegetation restoration efforts planned by the ESPFM and required as part of Condition of Certification **VIS-2**. As discussed in the **Visual Resources** section, **VIS-2** requires that a preference be given to native, non-invasive and drought tolerant species in the landscaping plan. As part of the ESEC amendment in 2007, Condition of Certification **BIO-9** required removal of iceplant and planting of seacliff buckwheat within the ESEC site as a result of impacts from the use of the beach delivery system. Eradication of iceplant infestation from the numerous areas within the ESEC site by restoring and planting native species, including seacliff buckwheat (*Erigonum parviflorum*) would benefit the El Segundo blue butterfly. This includes areas along the existing access road that is planned to be re-routed and near the guard station. As previously discussed the butterfly is known to occur approximately 1/2 mile from the ESEC site at the Chevron El Segundo Blue Butterfly Preserve. Since the butterfly is known to disperse to sites that are restored with its native host plant, such as at Torrance Beach and Ballona Creek Wetlands Preserve, it

is possible butterflies inhabiting the Chevron El Segundo Blue Butterfly Preserve could take advantage of this new food source and expand their distribution. Staff also recommends including Condition of Certification **BIO-9,** which requires implementation of iceplant eradication and native plant restoration at the ESPFM site. Iceplant removal and management of future infestations would enhance the success of the native planting and restore habitat for the El Segundo blue butterfly.

CUMULATIVE EFFECTS

Cumulative impacts are those that result from the incremental impacts of a proposed action considered with other past, present, and reasonably foreseeable future actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over time.

A project may result in a significant adverse cumulative impact if its effects are cumulatively considerable. The cumulative scenario for direct and indirect biological resources includes past, present, and reasonably foreseeable future projects with the potential to contribute to potentially significant impacts within a one-mile radius of the ESPFM, and the protected areas and USFWS recovery units contained therein. Beyond one-mile it is unlikely that local biological resources would be impacted by noise and other project-related impacts. In addition, beyond the marine and beach areas and a few scattered preserves much of the area outside of one-mile from the ESPFM is developed. Based on a review of the cumulative list of projects within one mile of the proposed ESPFM project, the Scattergood Unit 3 is Repowering Project is proposed near the proposed ESPFM project near the Dockweiler State Beach. The Scattergood Unit 3 Repowering Project is currently underway to construct four new power generating units at the existing Generating Station located less than one mile from proposed ESPFM project and located on Vista Del Mar across from Dockweiler State Beach and western snowy plover critical habitat. The Scattergood Unit 3 is not likely to have direct impacts, such as impacts from construction noise and other related activities, to special-status species or other biological resources, as special-status species are unlikely to occur on the industrial site. Additionally, construction of the proposed project and the Scattergood project is not likely to overlap, as the Scattergood Unit 3 is Repowering Project is expected to be complete in December 2015 and the ESPFM would not commence demolition until the first half of 2016 therefore cumulative indirect impacts to sensitive biological resources and special-status species would not likely occur. Once operational, the ESPFM would not result in a substantial change from baseline conditions for biological resources. Therefore, the ESPFM would not contribute considerably to cumulative impacts to biological resources.

Nitrogen Deposition

The cumulative scenario for nitrogen deposition impacts to biological resources includes past, present, and reasonably foreseeable future projects with emissions that contribute to nitrogen deposition in a six-mile radius of the ESPFM, and the protected areas and USFWS recovery units contained therein. These projects include the Scattergood Generating Station, the Redondo Beach Energy Project, and the LAX Central Utility Plant Replacement.

The emissions from the proposed ESPFM project would not be the only source of nitrogen deposition in protected areas and critical habitat in the region. There are existing industrial stationary sources as well as mobile sources (i.e., transportation) in the area that collectively contribute to elevated local and regional nitrogen deposition. Natural habitats in the project vicinity support populations of the federally listed El Segundo blue butterfly, and the area contains USFWS-designated recovery units for this species. Additional listed species in the region include western snowy plover, California least tern, and Belding's savannah sparrow. The cumulative nitrogen deposition scenario includes baseline (background) nitrogen deposition levels plus modeled levels from applicable regional sources. As discussed under indirect impacts above, impacts to western snowy plover from nitrogen deposition would not occur as habitats in the ESPFM project vicinity are not subject to weed invasions. In addition, impacts to Belding's savannah sparrow and California least tern from nitrogen deposition would not occur as habitat for these species in the ESPFM project vicinity is well below the critical load. It is anticipated that nitrogen deposition effects on the Recovery Units for El Segundo blue butterfly within the ESPFM plume would be negligible. Nitrogen deposition would not differ substantially from baseline conditions, and ESPFM's contribution to these would not be cumulatively considerable. Since operation of the proposed project would not result in cumulatively considerable impacts to federally-listed species, no mitigation is proposed. It is staff's opinion that take of listed species would not result, but the ultimate determination of federal ESA compliance will be made by the USEPA in coordination with USFWS upon initiation of ESA consultation and issuance a Biological Opinion, if required.

FACILITY CLOSURE

When the ESPFM is closed in the future, whether planned or unexpected, it must be done so that closure activities protect the environment and public health and safety. A closure plan would be prepared by the project owner prior to any planned closure. To address unanticipated facility closure, an "on-site contingency plan" would be developed by the project owner and approved by the Energy Commission compliance project manager (CPM). Facility closure requirements are discussed in more detail in the **General Conditions** section of FSA. Facility closure mitigation measures would also be included in the Biological Resources Mitigation Implementation and Monitoring Plan (BRMIMP) prepared by the project owner and described in Condition of Certification **BIO-9.**

Upon decommissioning and permanent facility closure, reclamation would be necessary to prevent adverse effects such as contamination from hazardous substances, erosion, dust, invasion and spread of weeds, and hazards to wildlife from abandoned project infrastructure. Staff concludes that these potential effects of facility closure and decommissioning would be a significant impact absent mitigation. Decommissioning activities are likely to cause similar indirect impacts to adjacent sensitive biological resources as described above for the construction and demolition phases of the proposed project.

To ensure that public health and safety and the environment are protected during decommissioning, the project owner committed to developing a decommissioning plan that would be submitted to the Energy Commission for approval prior to decommissioning (NRG 2012a). If possible, unused chemicals would be sold back to the suppliers or other purchasers or users. All equipment containing chemicals would be drained and shut down to ensure public health and safety and to protect the environment. All nonhazardous wastes would be collected and disposed of in appropriate landfills or waste collection facilities. All hazardous wastes would be disposed of according to all applicable LORS.

As described above, decommissioning and site closure would likely result in similar types of impacts to biological resources as construction and demolition. It is anticipated that conditions of certification similar to **BIO-6** through **BIO-10** and **BIO-15** though **BIO-17** would minimize or avoid these impacts to biological resources, and impacts to biological resources would be less than significant.

COMPLIANCE WITH LORS

The proposed project must comply with LORS that address state and federally listed species, as well as other sensitive biological resources. The ESPFM amendment is subject to the federal, state, and local LORS included in **Biological Resources Table 1**. **Biological Resources Table 4** includes an analysis of whether the proposed project would comply with the applicable LORS.

Biological Resources Table 4
Compliance with Federal, State, and Local LORS for Direct and Indirect Impacts

LORS	Compliance Determination	Discussion
FEDERAL		
Endangered Species Act (Title 16, United States Code, section 1531 et seq., and Title 50, Code of Federal Regulations, part 17.1 et seq.)	Yes	Construction of the proposed project would not result in significant impacts to federally-listed species. Activities necessary to plug intake and outfall structures, including n-water work and discharges from dewatering the forebay, as part of decommissioning the once-through cooling facilities would not result in significant impacts to federally-listed species. Condition of Certification **BIO-11** provides for acquiring a USACE permit and incorporating its terms and conditions into the Biological Resources Mitigation Implementation and Monitoring Plan (BRMIMP). However the ultimate determination of federal ESA compliance will be made by the NMFS with issuance of a Biological Opinion to USACE, as necessary.

LORS	**Compliance Determination**	**Discussion**
		Operation of the proposed project would not result in significant impacts to federally-listed species from nitrogen deposition, no new conditions of certification are proposed, however the ultimate determination of federal ESA compliance will be made by the USFWS with issuance of a Biological Opinion to US EPA, as necessary. The project owner would be responsible for incorporating its terms and conditions into the BRMIMP, as required by **BIO-9** and **BIO-12**.
Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 403),	Yes	In-water construction in waters of the United States requires a permit from the USACE. Condition of Certification **BIO-11** provides for acquiring a USACE permit and incorporating its terms and conditions into the BRMIMP, as required by **BIO-9** and **BIO-12**
Clean Water Act (Title 33, United States Code, sections 1251 through 1376, and Code of Federal Regulations, part 30, section 330.5(a)(26))	Yes	The proposed project would not result in loss or fill of wetlands or waters of the state, as there are none present on site. Indirect impacts resulting from degradation of adjacent coastal waters from construction runoff or operational discharges would be less than significant with implementation of Conditions of Certification **SOIL&WATER-1**, **SOIL&WATER-3**, **SOIL&WATER-5** The proposed project actions would result in potential impacts to waters of the U.S. Potential impacts resulting from the plugging of the Discharge 002 intake and outfall tunnels and dewatering of the forebay would be less than significant with implementation of Conditions of Certification **BIO-11**, **BIO-12**, and **BIO-13**.
Migratory Bird Treaty (Title 16, United States Code, sections 703 through 711)	Yes	Condition of Certification **BIO-17** provides for pre-construction nest surveys, protective buffers, and monitoring if nests are found, and Condition of Certification

LORS	Compliance Determination	Discussion
		BIO-16 limits disturbance off the project site.
Marine Mammal Protection Act	Yes	In-water construction in waters of the United States and discharges to a water of the United States requires a permit from the USACE. Condition of Certification **BIO-11** provides for acquiring a USACE permit and incorporating its terms and conditions into the BRMIMP. If necessary consultation between USACE and NOAA may occur and issuance of a Biological Opinion may follow. The project owner would be responsible for incorporating its terms and conditions into the BRMIMP, as required by **BIO-9** and **BIO-12**
Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. 1801 et seq.)	Yes	In-water construction in waters of the United States and discharges to a water of the United States requires a permit from the USACE. Condition of Certification **BIO-11** provides for acquiring a USACE permit and incorporating its terms and conditions into the BRMIMP. If necessary consultation between USACE and NMFS may occur and issuance of a Biological Opinion may follow, the project owner would be responsible for incorporating its terms and conditions into the BRMIMP, as required by **BIO-9** and **BIO-12**. The proposed project would result in actions with potential impacts to waters the U.S.. Potential impacts resulting from the plugging of the Discharge 002 intake and outfall tunnels and dewatering of the forebay would be less than significant with implementation of Conditions of Certification **BIO-11**, **BIO-12**, and **BIO-13**.
STATE		
California Endangered Species Act of 1984 (Fish and Game Code, sections 2050 through 2098)	Yes	Potential impacts to state listed species would be less than significant with implementation of Conditions of Certification **NOISE-4**, **NOISE-6**, **VIS-6**, **VIS-7**, **VIS-8**, **BIO-16**, and **BIO-17**.
California Code of Regulations (Title 14,	Yes	Potential impacts to state listed species would be less than significant with

LORS	**Compliance Determination**	**Discussion**
sections 670.2 and 670.5)		implementation of Conditions of Certification **NOISE-4**, **NOISE-6**, **VIS-6**, **VIS-7**, **VIS-8**, **BIO-16** and **BIO-17**.
Fully Protected Species (Fish and Game Code, sections 3511, 4700, 5050, and 5515)	Yes	Potential impacts to state listed species would be less than significant with implementation of Conditions of Certification **NOISE-4**, **NOISE-6**, **VIS-6**, **VIS-7**, **VIS-8**, **BIO-16, and BIO-17**. Condition of Certification **BIO-17** provides for pre-construction nest surveys, protective buffers, and monitoring if nests are found.
Nest or Eggs (Fish and Game Code, section 3503)	Yes	Condition of Certification **BIO-17** provides for pre-construction nest surveys, protective buffers, and monitoring if nests are found, and the project is required to implement a Worker Environmental Awareness Program (WEAP) (**BIO-10**) to educate workers about compliance with environmental regulations, including Fish and Game Code. In addition implementation of **NOISE-4**, **NOISE-6** and **BIO-16** would reduce impacts to nests and eggs to less than significant,
Birds of Prey (Fish and Game Code, section 3503.5)	Yes	Condition of Certification **BIO-17**provides for pre-construction nest surveys, protective buffers, and monitoring if nests are found, and the project is required to implement a WEAP (**BIO-10**) to educate workers about compliance with environmental regulations, including the Fish and Game Code. In addition, implementation of **NOISE-4**, **NOISE-6**, **VIS-6**, **VIS-7**, **VIS-8**, and **BIO-16** would reduce impacts birds of prey to less than significant,
Migratory Birds (Fish and Game Code, section 3513)	Yes	Condition of Certification **BIO-17**provides for pre-construction nest surveys, protective buffers, and monitoring if nests are found The project is required to implement a WEAP (**BIO-10**) to educate workers about compliance with environmental regulations, including Fish and Game Code. In addition

LORS	Compliance Determination	Discussion
		implementation of **NOISE-4**, **NOISE-6**, **VIS-6**, **VIS-7**, **VIS-8**, and **BIO-16** would reduce impacts migratory birds to less than significant,
Significant Natural Areas (Fish and Game Code section 1930 and following)	Yes	There are no impacts to significant natural areas as the project would have no impacts on refuges, natural sloughs, riparian areas, and vernal pools.
Native Plant Protection Act of 1977 (Fish and Game Code section 1900 and following)	Yes	The project would not impact any rare, threatened, or endangered plants.
California Coastal Act (Public Resources Code, sections 30000 et seq.)	Yes	The project would have no impact on wetlands under the jurisdiction of California Coastal Commission. Indirect impacts resulting from degradation of adjacent coastal waters from construction runoff or operational discharges would be less than significant with implementation of Conditions of Certification **SOIL&WATER-1**, **SOIL&WATER-3**, **SOIL&WATER-5**
LOCAL		
El Segundo General Plan/Conservation Element	Yes	The project would be in compliance with the El Segundo General Plan Conservation Element as the project would not result in any significant impacts to El Segundo blue butterfly and with vegetation restoration activities proposed as part of **VIS-2** and **BIO-9**.

The proposed project would result in actions with potential impacts to waters of the U.S.. Potential impacts resulting from the plugging of the Discharge 002 intake and outfall tunnels and dewatering of the forebay would be less than significant with implementation of Conditions of Certification **BIO-11**, **BIO-12**, and **BIO-13**. These conditions would ensure compliance with the federal Clean Water Act, Section 10 of the Rivers and Harbors Act of 1899, and the Magnuson-Stevens Fishery Conservation and Management Act by requiring implementation of all permit requirements.

NOTEWORTHY PUBLIC BENEFITS

The ESPFM would not use ocean water for cooling, as is currently in use for the El Segundo Generating Station, Units 3 and 4. Therefore, the ESPFM would eliminate the potential for entrainment of aquatic species. In addition, the ESPFM would eliminate ocean discharge of industrial and sanitary wastewater. Stormwater discharge would still occur via Outfall 002 via a drop inlet installed west of the plug. The reduction in outfall discharge into the Pacific Ocean and the elimination of impingement and entrainment of marine organisms is a noteworthy environmental public benefit.

RESPONSE TO COMMENTS

SCOPING COMMENTS

The following is a summary of scoping comments addressing biological resources received on the ESPFM from the project owner, interested agencies, and the public. These comments aided in defining the scope and content of the analysis of impacts to biological resources, and are incorporated herein.

During a workshop held on October 1, 2013 an intervenor voiced concerns regarding potential noise and vibration related impacts from the El Segundo Power Facility Modification (ESPFM) project on marine wildlife. Staff reviewed the ESPFM amendment project description and determined there are no in-water or other construction-related noises that would likely disturb marine mammals (whales, pinnipeds, or dolphins). Construction activities will be performed onshore, and there will be no pile-driving or underwater noise-making activities therefore the proposed amended project would not result in impacts to marine mammals.

COMMENTS ON THE PSA

Staff received comments on the Biological Resources sections of the Preliminary Staff Assessment for the proposed ESPFM. The
following provides a summary of pertinent comments and staff's response to each.

Locke Lord, LLP; May 5, 2014; TN#202293 – Project Owner Comments on the PSA

Comment: The project owner suggested revisions to several conditions of certification. However, staff did not have enough information regarding the proposed edits to consider a reply and whether to accept any proposed revisions. Staff requested additional information from the project owner on May 19, 2014 (TN# 202352) Staff responded to these comments with supplemental information provided by the project owner below (TN#202401).

Locke Lord, LLP; May 5, 2014; TN#202401–Supplemental Information Regarding Project Owner's Responses to Biological Resources Conditions of Certification Proposed in the Preliminary Staff Assessment

The project owner suggested revisions to several conditions of certification and provided clarifications and other additional information in the supplemental information. The project owner also withdrew several requested changes. Staff reviewed each proposed revision, and accepted the ones that did not change the intent of the conditions or their effectiveness for reducing impacts. Staff has responded to individual comments, as necessary, below.

Comment: The project owner proposed specifying that the BRMIMP, required as part of **BIO-9,** would apply to the construction phase only.

Response: Staff does not agree that the BRMIMP should only apply during construction as the BRMIMP also applies during operation and closure, see **BIO-9** bullets 11 and 13. The BRMIMP may also have federal permit terms and conditions incorporated which would apply during operation and closure. The project owner would not be required to implement any unnecessary mitigation or monitoring activities during operation so there is no need to include this proposed language.

Comment: The project owner proposed deletion of Condition of Certification **BIO-17**, as they state it is redundant with their proposed language added to Condition of Certification **BIO-9**, Item 6. The project owner states that they intend to incorporate a plan for measures to avoid or minimize impacts to sensitive, nesting avian species into the BRMIMP and included a reference to nesting birds in **BIO-9**, Item 6.

Response: Staff does not agree that the inclusion of a reference to nesting birds in **BIO-9**, Item 6 would allow for deletion of **BIO-17**. The project owner did not include any details regarding the survey methods, timing, or reporting measures to be included to avoid or minimize impacts to sensitive, nesting avian species. In addition, the purpose of the BRMIMP, required under **BIO-9**, is to compile all project resource mitigation, monitoring, and compliance measures, as well as other information necessary to ensure compliance with, and effectiveness of, all impact avoidance, minimization, and mitigation measures. The measures are typically included in separate conditions of certification.

Without mitigation measures fully described and included in the FSA, staff would be unable to determine if project impacts to nesting birds would be less that significant and would instead defer the specific mitigation decisions and identification of performance criteria until post-certification. Condition of Certification **BIO-17** is necessary to fully describe staff's proposed mitigation and includes the requirements for survey methods, timing, and reporting to reduce impacts to protected avian species to less than significant. Since publication of the Preliminary Staff Assessment, staff has reviewed Nesting Bird Survey Reports included in the Monthly Compliance Reports for the prior amendment and determined that the surveys conducted were adequate for the proposed ESPFM project site (NRG 2011a, NRG 2011b). Staff has revised **BIO-17** based on the prior methods utilized on the ESEC site and has modified the condition of

certification to only require one pre-construction nest survey instead of two since the site is primarily developed with limited habitat around the perimeter. However, additional surveys would need to be conducted if construction inactivity exceeds three weeks in any given area. Staff does not recommend adopting the revised language proposed by the project owner in **BIO-9**.

Comment: The project owner requested edits to **BIO-9**, Item 15 as they state the requirement was specific to the 2010 license for the ESEC as impacts to known populations of seacliff buckwheat would have occurred offsite as a result of the proposed beach delivery. Impacts would have occurred offsite, directly west of the facility, and would have required restoration of beach areas that include habitat for seacliff buckwheat. The project owner states that this requirement of the BRMIMP was intended to be specific to the restoration of beaches offsite if a beach delivery method was employed during construction. The project owner states that the onsite areas of the facility have specific planting requirements, including use of native, non-invasive, and drought tolerant species.

Response: Visual Resources Condition of Certification **VIS-1,** requires landscaping with a preference for vegetation that are native species and/or species requiring little or no irrigation. The seacliff buckwheat meets these criteria and should be included in the landscaping plan. This species is native to coastal strand, coastal sage scrub, bluffs and dunes along the coast and therefore tolerates seaside conditions and is also very drought tolerant which can do with or without water (1- 2 times/month) and would likely thrive on site (CNPSSD 2014). Seacliff buckwheat is known to occur in the project vicinity and would provide an added benefit by providing potential host plants for the federally endangered El Segundo blue butterfly. Staff does not recommend adopting the revised language.

Comment: The project owner requested edits to **BIO-9**, Item 16 as the project owner objected to this requirement because, as written, it creates a subjective standard for an expensive procedure, instead of providing clear parameters for the scale of the required photography.

Response: Staff has incorporated specific requirements for scale of maps into the condition of certification.

Comment: The project owner requested edits to **BIO-9**, Item 17 as the project owner states the California Department of Fish and Wildlife already requires qualified, mandated reporters to record and submit field observations of Threatened, Endangered, or Special Concern species. The project owner states that by imposing this requirement as a condition of certification, this requirement could be misinterpreted as requiring persons who are not mandatory reporters to report any such sightings, resulting in over-reporting and/or incorrect reports.

Response: The intent of CNDDB as described on the CDFW website is to have biologists submit data from field observations. Staff included **BIO-9**, Item 17 so that anytime an approved biologist is on site during either project surveys, biological monitoring, or other site visits the biologist would report field observations of special-

status species to CDFW and the CPM. Staff has incorporated minor changes to clarify the requirements for reporting into the condition of certification.

Comment: The project owner proposed limiting **BIO-10** so that it does not apply during operations because there is no potential for significant impacts to biological resources during operations. The project owner states that there is no apparent need for the project owner to develop and implement an intensive training and record-keeping program for the protection of such biological resources during power plant operations when those operations will not significantly impact sensitive biological resources.

Response: The intent of WEAP training is to provide a mechanism for training the on-site project construction and maintenance personnel, as well as protect site visitors on how to protect sensitive biological resources and the consequences of noncompliance. While habitat may be limited within the project site, the ESPFM is adjacent to marine and beach areas that are known habitat for federally and state listed species. The training is necessary throughout the life of the project to protect species, including birds protected by the Migratory Bird Treaty Act, that could be impacted during routine maintenance and operation activities, such as vegetation management,. As stated in the FSA, birds could nest in the ornamental plantings along the perimeter of the ESEC site or equipment and other available substrate in the areas within the ESEC site. The required WEAP on-site or training center presentation may include a video presentation which would be of no additional cost to utilize in operations and with 50 full-time employees staff does not consider this an arduous requirement to maintain records of signed statements of training completion during the operations phase. Staff does not recommend adopting the revised language.

Comment: The project owner proposed changes to language in **BIO-16**, Item 1, stating the condition is redundant with the requirements in Condition of Certification **BIO-9**, Item 6 for project owner to develop a plan that includes detailed descriptions of all measures that will be implemented to avoid and/or minimize impacts to sensitive species and reduce habitat disturbance.

Response: Staff included **BIO-16**, Item 1 because this is a standard method to avoid wildlife pitfalls and should be included in the BRMIMP to meet, in part, the requirements of **BIO-9**, Item 6. Therefore, it is not a redundant requirement but instead provides specific measures that should be included in the BRIMIMP to avoid and minimize impacts to wildlife. Staff does not recommend deletion of the requirement.

Comment: The project owner proposed changes to language in **BIO-16,** Item 5 regarding the procedure for reporting animal deaths. The project owner states that they are willing to comply with the majority of this new condition of certification however, because the requirement to report all animal deaths on site has no basis in applicable laws and regulations, project owner proposed edits to refocus this component on protected species.

Response: Staff considered the request for this change in the language of **BIO-16**, Item 5. This requirement is, in part, related to ensuring all special status species injuries or deaths on site are reported to the appropriate agencies. It is not expected that the

construction personnel would be able to identify if a species was listed or not, so any animal injury or death must be reported to the Designated Biologist or Biological Monitor who is responsible for reporting these incidents. In addition, this requirement is related to maintaining good housekeeping on site by reporting all injured and dead animals to the Designated Biologist or Biological Monitor to dispose of according to any state or local requirements. Any dead bird protected by the Migratory Bird Treaty Act must handled by a biologist with valid state and federal permits and be reported to the appropriate agencies. In addition, dead or injured animals could provide subsidies to crows and gulls, which are predators of the federally-listed snowy plover. Critical habitat for the snowy plover is immediately north of the ESPFM site. Staff does not recommend adopting the revised language.

Comment: The project owner proposed changes to language in **BIO-16,** Item 10 and 11 as the project owner states they are already following a landscaping plan for the previous ESEC amendment, as required under Condition of Certification **VIS-2**. The project owner states that after construction of the project portion of the facility, the project owner would have implemented any additional landscaping required for the Project, and would be maintaining this new landscaping as well as the facility's existing landscaping which would minimize the spread and propagation of nonnative, invasive weeds and obviate the need for the weed abatement measures required by Items 10 and 11.

Response: Staff considered the requested changes. Staff agrees that **BIO-16**, Item 10 may be modified to address weed management during construction only as weed management would be addressed during operations as part of the **VIS-2** landscaping plan. Staff has incorporated minor changes into the condition of certification to clarify that the requirements for weed management per **BIO-16**, Item 10 is required only during construction.

Staff does not recommend adopting the revised language in **BIO-16**, Item 11 as these measures are standard Best Management Practices (BMPs) that would ensure sensitive species located offsite adjacent to the ESPFM site are protected from non-point source pollution and to ensure offsite habitats for federally and state listed species are not impacted by herbicide and pesticide management activities. Staff removed the requirement that if rodent control must be conducted, zinc phosphide or an equivalent product shall be used as this is applicable in areas with potential risk from secondary poisoning to kit fox or other large mammalian predators which is not the case at ESPFM.

Comment: The project owner proposed deletion of **BIO-17** as they state it requires redundant efforts to those proposed to be added to **BIO-9**, and focuses solely upon nesting birds. The project owner states that **BIO-9**,Item 6 affects a broader range of species than birds and already requires project owner to implement a system like that prescribed in **BIO-17** should such circumstances apply. The project owner has suggested expanding the language of **BIO-9**, Item 6 to expressly encompass nesting birds, instead of adding a separate condition of certification for nesting birds.

The project owner states that except for previously proposed beach construction-related activities, there is no potential impact to nesting birds.

Response: Staff does not agree that with the inclusion of a reference to nesting birds in **BIO-9**, Item 6 would allow for deletion of **BIO-17**. The project owner did not include any details regarding the survey methods, timing or reporting to be included as measures to avoid or minimize impacts to sensitive, nesting avian species. In addition, the purpose of the BRMIMP, required under **BIO-9**, is to compile all project resource mitigation, monitoring, and compliance measures, as well as other information necessary to ensure compliance with, and effectiveness of, all impact avoidance, minimization, and mitigation measures. As stated above under responses to comments on **BIO-9**, Item 6, staff does not recommend adopting the proposed deletion. In addition, staff does not agree that there is not any potential to impact birds, absent the previously proposed beach delivery activities. As stated in staff's testimony, the proposed project area provides marginally suitable nesting habitat for a variety of common bird species which could nest in the ornamental plantings along the perimeter of the ESPFM site. Additionally, some bird species adapted to disturbed environments could nest in equipment or other available substrate in the areas within the ESPFM site. As part of construction monitoring for the prior ESEC amendment, the Designated Biologist determined nesting bird surveys were necessary and conducted two separate surveys within the project boundaries prior to construction activities that could disturb nests if present (NRG 2011a, NRG 2011b). Staff has included **BIO-17** to ensure that the surveys are conducted and reporting mechanisms are included to provide results to the CPM for review.

CONCLUSIONS

The project site is an industrial site within an operating power plant and vegetation is limited to landscaping along the perimeter of the facility and internally along berms. The offsite laydown areas are within industrial areas and most are existing parking and storage areas. Rare plants and special-status wildlife are not expected to occur onsite, with the exception of birds protected by the Migratory Bird Treaty Act. However, nearby beaches and other natural areas support special-status birds including the western snowy plover (federally listed threatened), California least tern (federally and state-listed endangered), and California brown pelican (state fully protected). Given the proximity of the proposed project to the aforementioned biological resources, construction and operation would result in the direct and indirect effects. With the implementation of conditions of certification presented in **Biological Resources Table 5**, these project impacts would be less than significant.

Biological Resources Table 5
Summary of Impacts to Biological Resources from the ESPFM

Impact	Condition of Certification	Significance Determination
CONSTRUCTION IMPACTS		
Native vegetation: removal of native vegetation	None	Less than significant
Common wildlife: disturbance and injury or mortality to common wildlife, including nesting birds	• **BIO-16** requires impact minimization measures including avoidance of wildlife pitfalls • **BIO-17** requires pre-construction nest surveys and impact avoidance	Less than significant with implementation of conditions of certification
Special-status wildlife: disturbance from noise and lighting, stormwater runoff, or groundwater contamination	• **NOISE-4** requires low pressure steams blows • **NOISE-6** requires noise mitigation measures to limit increase in noise levels • **NOISE-8** requires noise restrictions at night during construction • **BIO-16** controls invasive weeds and other measures to reduce impacts • **BIO-17** requires pre-construction nest surveys and impact avoidance and measures to limit impacts from noise; • **SOIL&WATER-1** requires preparation of a SWPPP to control runoff and prevent contamination; • **VIS-8** minimizes offsite lighting during construction	Less than significant with implementation of conditions of certification
Jurisdictional wetlands and waters: degradation from runoff of sediment or toxic substances from the project	• **SOIL&WATER-1** requires preparation of a SWPPP to control runoff and	Less than significant with implementation of condition of certification

Impact	Condition of Certification	Significance Determination
site. Work within a water of the US. Discharge from dredge or fill materials into a water of the U.S.	prevent contamination; • **SOIL&WATER-3** requires compliance with NPDES permit for discharge of waste and stormwater discharge to the Pacific Ocean • **SOIL&WATER-5** requires permit to discharge contaminated groundwater and compliance with permit conditions; • **BIO-11** requires compliance with USACE permit conditions • **BIO-12** requires compliance with the terms and conditions of the USFWS biological opinion,if required • **BIO-13** requires compliance with LARWQCB permit conditions	
Noise: disturbance resulting in decreased productivity of special-status birds	• **NOISE-4** requires low pressure steams blows • **NOISE-6** requires noise mitigation measures to limit increase in noise levels • **NOISE-8** requires noise restrictions at night during construction • **BIO-17** requires pre-construction nest surveys and impact avoidance;	Less than significant with condition of certification
Lighting: disturbance resulting in altered behavior or increased predation	• **VIS-8** minimizes offsite lighting	Less than significant with condition of certification
Stormwater runoff: degradation of adjacent habitat	• **SOIL&WATER-1** requires	Less than significant with conditions of

Impact	Condition of Certification	Significance Determination
	preparation of a SWPPP to control runoff	certification
• **OPERATION IMPACTS**		
Noise: disturbance resulting in decreased productivity of special-status birds	• **NOISE-6** requires noise mitigation measures to limit increase in noise levels	**At beaches and marine areas:** less Less than significant with implementation of condition of certification
Lighting: disturbance resulting in altered behavior or increased predation	• **VIS-6 and VIS-7** minimizes offsite lighting	Less than significant with implementation of condition of certification
Stormwater runoff: degradation of adjacent habitat	• **SOIL&WATER-3** requires compliance with NPDES permit requirements for discharge during operations	Less than significant with implementation of condition of certification
Nitrogen deposition: degradation of habitat by enhancing invasive weeds	None	Less than significant

OVERALL CONCLUSION

Staff concludes that with implementation of proposed conditions of certification, compliance with LORS would be achieved and all direct, indirect, and cumulative impacts would be avoided, minimized, or mitigated to less than significant levels.

PROPOSED CONDITIONS OF CERTIFICATION

Following are the existing conditions of certification applicable to El Segundo Power Facility Modification (ESPFM) project. For completeness staff shows the conditions of certification that were deleted at the time of the 2007 amendment Based on project changes, new conditions of certification are added and existing conditions of certification have been modified. Staff has proposed modifications to the conditions of certification as shown below and also has incorporated edits recommended by the project owner. Since publication of the PSA staff has determined Conditions of Certification **BIO-11** and **BIO-13** are required due to the decommissioning of the intake/outfall structures and has included these conditions of certification in the FSA with minor modifications to the language that was included in the previous ESEC amendment that addressed the beach delivery systemThe added text is identified as **bold** and **underlined,** and the deleted text is identified as ~~strikethrough~~.

BIO-1 Deleted at the time of the 2007 Amendment

BIO-2 Deleted at the time of the 2007 Amendment

BIO-3 Deleted at the time of the 2007 Amendment

BIO-4 Deleted at the time of the 2007 Amendment

BIO-5 Deleted at the time of the 2007 Amendment

DESIGNATED BIOLOGIST

BIO-6 The project owner shall submit the resume, including contact information, of the proposed Designated Biologist to the CPM for approval.

The Designated Biologist must meet the following minimum qualifications:

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

In lieu of the above requirements, the resume shall demonstrate to the satisfaction of the CPM, that the proposed Designated Biologist or alternate has the appropriate training and background to effectively implement the conditions of certification.

Verification: The project owner shall submit the specified information at least 60 days prior to the start of any site mobilization ~~related to the beach front or the beach delivery system. These~~ **S**~~s~~ite and related facility activities shall not commence until an approved Designated Biologist is available to be on site.

If a Designated Biologist needs to be replaced, then the specified information of the proposed replacement must be submitted to the CPM at least ten working days prior to the termination or release of the preceding Designated Biologist. **In an emergency, the project owner shall immediately notify the CPM to discuss the qualifications and approval of a short-term replacement while a permanent Designated Biologist is proposed to the CPM for consideration.**

DESIGNATED BIOLOGIST DUTIES

BIO-7 The Designated Biologist shall perform the following during any ~~beach front or the beach delivery system~~ site mobilization, ground disturbance, **demolition**, grading, construction, operation, and closure activities:

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

2. Be available to supervise or conduct mitigation, monitoring, and other biological resources compliance efforts, particularly in areas requiring avoidance or containing sensitive biological resources, such as special status species or their habitat;

3. Clearly mark sensitive biological resource areas and inspect these areas at appropriate intervals for compliance with regulatory terms and conditions;

4. **Periodically inspect areas with high vehicle activity (e.g., parking lots) for animals in harm's way;**

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

6. Respond directly to inquiries of the CPM regarding biological resource issues;

Verification: The Designated Biologist shall maintain written records of the tasks described above, and summaries of these records shall be submitted in the Monthly Compliance Reports. **If actions may affect biological resources during operation a Designated Biologist shall be available for monitoring and reporting.** As necessary during project operation, the Designated Biologist shall submit record summaries in the Annual Compliance Report.

DESIGNATED BIOLOGIST AND BIOLOGICAL MONITOR AUTHORITY

BIO-8 The project owner's Construction/Operation Manager shall act on the advice of the Designated Biologist **and Biological Monitor(s)** to ensure conformance with the biological resources Conditions of Certification.

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

The Designated Biologist shall:

1. Require a halt to all activities in any area when determined that there would be adverse impact to biological resources if the activities continued;

2. Inform the project owner and the Construction/Operation Manager when to resume activities; and

3. Notify the CPM if there is a halt of any activities due to conflicts with biological resources, and advise the CPM of any corrective actions that have been taken, or will be instituted, as a result of the halt.

If the Designated Biologist is unavailable for direct consultation, the Biological Monitor shall act on behalf of the Designated Biologist.

Verification: The project owner shall ensure that ~~T~~**t**he Designated Biologist ~~must notify~~ **notifies** the CPM immediately (and no later than the following morning of the incident, or Monday morning in the case of a weekend) of any non-compliance or a halt of any site mobilization, ground disturbance, grading, construction, and operation activities. The project owner shall notify the CPM of the circumstances and actions being taken to resolve the problem.

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

BIOLOGICAL RESOURCES MITIGATION IMPLEMENTATION AND MONITORING PLAN (BRMIMP)

BIO-9 The project owner shall submit to the CPM for review and approval, a copy of the final Biological Resources Mitigation Implementation and Monitoring Plan (BRMIMP) and, once approved, shall implement the measures identified in the plan. ~~The BRMIMP shall apply to beach delivery only.~~

The BRMIMP shall include:

1. All new Biological Resource conditions **of certification** included in the Energy Commission's ~~Final~~ Decision as amended;
2. All biological resources mitigation, monitoring, and compliance measures proposed and agreed to by the project owner;
3. **All required mitigation measures for each sensitive biological resource;**
4. A list and a map of locations of all sensitive biological resources to be impacted, avoided, or mitigated by project construction and operation;
5. A list of all terms and conditions set forth by the USACE permits and necessary state LARWQCB certifications, should these become necessary throughout the life of the project;
6. Detailed descriptions of all measures that will be implemented to avoid and/or minimize impacts to sensitive species and reduce habitat disturbance;
7. All locations, on a map of suitable scale, of areas requiring temporary protection and avoidance during construction **and demolition**;
8. Duration for each type of monitoring and a description of monitoring methodologies and frequency;

9. Performance standards to be used to help decide if/when proposed mitigation **and conditions** ~~is~~ **are** ~~or~~ ~~is~~ not successful;
10. All performance standards and remedial measures to be implemented if performance standards are not met;
11. A discussion of biological resource-related facility closure measures ;
12. A process for proposing plan modifications to the CPM and appropriate agencies for review and approval;
13. A copy of any ~~State or~~ USFWS Biological Opinion or NMFS consultation, and incorporation of all terms and conditions into the final BRMIMP, should a biological opinion become necessary any time throughout the life of the project;
14. Protocols for dealing with wildlife that gain access ~~the barges, beach delivery ramp, and other~~ **to** project features whereby their well being could be at risk; and
15. Vegetation restoration that provides for planting seacliff buckwheat (*Eriogonum parviflorum*), eradication of ice plant (*Caprobrotus chilensis*), and is coordinated with Visual Resources landscaping requirements.
16. **Aerial photographs, at a 1:2,400 scale or alternative CPM-approved scale proposed by project owner, of all areas to be disturbed during project construction activities; include one set prior to any site or related facilities mobilization disturbance and one set subsequent to completion of project construction.**
17. **A requirement to submit any sightings of any special-status species that are observed on or in proximity to the project site during monitoring or site visits, or during project surveys, to the California Natural Diversity Database (CNDDB) per CDFW requirements.**

Verification: At least 30 days prior to start of any site mobilization activities ~~related to the beach front or the beach delivery system~~, the project owner shall provide the CPM with the final version of the BRMIMP for this project, and the CPM will determine the plans acceptability.

If there are any permits that have not yet been received when the BRMIMP is first submitted, these permits shall be submitted to the CPM, within 5 days of their receipt, and the BRMIMP shall be revised or supplemented to reflect the permit condition within 10 days of their receipt by the project owner. Ten days prior to site (and related facilities) mobilization, the revised BRMIMP shall be resubmitted to the CPM.

The project owner shall notify the CPM five (5) working days before implementing any CPM approved modifications to the BRMIMP.

Implementation of BRMIMP measures shall be reported in the monthly compliance reports by the designated biologist (i.e., survey results, construction activities that were monitored, species observed, vegetation restoration etc).

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

WORKER ENVIRONMENTAL AWARENESS PROGRAM (WEAP)

BIO-10 The project owner shall develop and implement a CPM approved Worker Environmental Awareness Program **(WEAP)** in which each of its employees, as well as employees of contractors and subcontractors who work on the project site or related facilities during **demolition,** construction**,** and operation, are informed about sensitive biological resources associated with the project. The training may be presented on electronic media in the form of a video recording.

The ~~Worker Environmental Awareness Program~~ **WEAP** must:

1. Be developed by **or in consultation with** the Designated Biologist and consist of an on-site or training center presentation in which supporting written material ~~may be~~ **is** made available to all participants;
2. Discuss the locations and types of sensitive biological resources on the project site and adjacent areas;
3. Present the reasons for protecting these resources;
4. Present the meaning of various temporary and/or permanent habitat protection measures; and
5. Identify whom to contact if there are further comments and questions about the material discussed in the program.

The specific program can be administered by a competent individual(s) acceptable to the Designated Biologist. Each participant in the on-site Worker Environmental Awareness Program shall sign a statement declaring that the individual understands and shall abide by the guidelines set forth in the program materials. The person administering the program shall also sign each statement.

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

signed statements for active project operational personnel shall be kept on file for the duration of their employment and for six months after their termination.

U. S. ARMY CORPS OF ENGINEERS PERMIT

BIO-11 The project owner shall acquire any USACE permit **(Section 10 and/or Section 404)** required and incorporate its terms and conditions into the Biological Resources Mitigation Implementation and Monitoring Plan (BRMIMP).

Verification: No less than 30 days prior to the start of any site mobilization activities related to **decommissioning the once-through cooling facilities for Units 3 and 4 and related in-water forebay work** ~~the beach front or the beach delivery system~~, the project owner shall submit to the CPM a copy of the USACE permit **(Section 10 and/or Section 404)** required to construct any project related features. Permit terms and conditions will be incorporated into the BRMIMP **for implementation**.

~~USFWS~~ FEDERAL BIOLOGICAL OPINION

BIO-12 If formal or informal consultation between the **U.S. Fish and Wildlife Service (USFWS) and/or National Marine Fisheries Service (NMFS)** ~~USFWS and USACE~~ **and the U.S. Environmental Protection Agency (USEPA) and/or U.S. Army Corps of Engineers (USACE)** occurs, the project owner shall incorporate into the Biological Resources Mitigation Implementation and Monitoring Plan (BRMIMP) any resulting **terms and conditions and all** biological resources recommendations **for implementation**.

Verification: No less than 30 days prior to the start of any site mobilization activities ~~related to the beach front or the beach delivery system~~, the project owner must provide the CPM with a copy of ~~the~~ **any** USFWS **and/or NMFS, and the U.S. Environmental Protection Agency (USEPA) and/or U.S. Army Corps of Engineers (USACE** recommendations. All terms and conditions resulting from the consultation will be incorporated into the BRMIMP **and implemented**.

LOS ANGELES REGIONAL WATER QUALITY CONTROL BOARD CERTIFICATION

BIO-13 The project owner will acquire and implement the terms and conditions of a Los Angeles Regional Water Quality Control Board Section 401 State Clean Water Act certification pertaining to the project.

Verification: No less than 30 days prior to the start of any site mobilization activities related to **decommissioning the once-through cooling facilities for Units 3 and 4 and related in-water forebay work** ~~the beach front or the beach delivery system~~, the project owner will provide the CPM with a copy of the final Regional Water Quality Control Board certification. The terms and conditions of the certification will be incorporated into the project's Biological Resources Mitigation Implementation and Monitoring Plan **and implemented**.

FACILITY CLOSURE

BIO-14 The project owner will incorporate into the planned permanent or unexpected permanent closure plan measures**, including a description of funding mechanism(s)** that address the local biological resources. The biological resource facility closure measures will also be incorporated into the project Biological Resources Mitigation Implementation and Monitoring Plan.

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

BIOLOGICAL MONITOR SELECTION

BIO-15 The project owner's CPM-approved Designated Biologist shall submit the resume, at least three references, and contact information of the proposed Biological Monitors to the CPM for approval. The resume shall demonstrate, to the satisfaction of the CPM, the appropriate education and experience to accomplish the assigned biological resource tasks.

Verification: The project owner shall submit the specified information to the CPM for approval at least 30 days prior to the start of any project-related site disturbance activities. The Designated Biologist shall submit a written statement to CPM confirming that individual Biological Monitor(s) have been trained including the date when training was completed. If additional biological monitors are needed during construction, the specified information shall be submitted to the CPM for approval at least 10 days prior to their first day of monitoring activities.

GENERAL IMPACT AVOIDANCE AND MINIMIZATION MEASURES

BIO-16 The project owner shall implement the following measures during site mobilization, demolition, construction, operation, and closure to manage their project site and related facilities in a manner to avoid or minimize impacts to biological resources:

1. **At the end of each work day, the Designated Biologist, Biological Monitor, and/or site personnel shall ensure that all potential wildlife pitfalls (trenches, bores, and other excavations) have been backfilled. If site personnel are inspecting trenches, bores, and other excavations and wildlife is trapped, they will immediately notify the Designated Biologist and/or Biological Monitor. If backfilling is not feasible, all trenches, bores, and other excavations shall be sloped at a 3:1 ratio at the ends to provide wildlife escape ramps, or covered completely to prevent wildlife access. Should wildlife become trapped, the Designated Biologist or Biological Monitor shall remove**

and relocate the individual to a safe location. Any wildlife encountered during the course of construction shall be allowed to leave the construction area unharmed.

2. **Soil bonding and weighting agents used on unpaved surfaces shall be non-toxic to wildlife and plants.**
3. **Unless otherwise required by the Federal Aviation Administration (FAA), FAA visibility lighting shall employ only strobed, strobe-like or blinking incandescent lights, preferably with all lights illuminating simultaneously. Minimum intensity, maximum "off-phased" duel strobes are preferred, and no steady burning lights (e.g., L-810s) shall be used.**
4. **Water applied to dirt roads and construction areas (trenches or spoil piles) for dust abatement shall use the minimal amount needed to meet safety and air quality standards in an effort to prevent the formation of puddles, which could attract California least tern and western snowy plover predators to construction sites. During construction, site personnel shall patrol these areas to ensure water does not puddle and attract crows and other wildlife to the site, and shall take appropriate action to reduce water application rates where necessary.**
5. **Report all inadvertent deaths of special-status species to the appropriate project representative, including road kill. Species name, physical characteristics of the animal (sex, age class, length, weight), and other pertinent information shall be noted and reported in the monthly compliance reports. For special-status species, the Designated Biologist or Biological Monitor shall contact CDFW and/or USFWS and the CPM within 1 working day of receipt of the carcass for guidance on disposal or storage of the carcass. Injured animals shall be reported to CDFW and/or USFWS and the CPM, and the project owner shall follow instructions that are provided by CDFW or USFWS. During construction, injured or dead animals detected by personnel in the project area shall be reported immediately to a Biological Monitor or Designated Biologist, who shall remove the carcass or injured animal promptly. During operations, the Project Environmental Compliance Monitor shall be notified.**
6. **The Designated Biologist shall be informed of any hazardous spills immediately as directed in the project Hazardous Materials Plan.**
7. **During construction all trash and food-related waste shall be placed in self-closing containers and removed weekly or more frequently from the site. Workers shall not feed wildlife, or bring pets to the project site.**

8. **The project owner shall implement the following measures during construction and operation to prevent the spread and propagation of nonnative, invasive weeds:**

   a. **Use only weed-free straw, hay bales, and seed for erosion control and sediment barrier installations.**

   b. **Invasive non-native species shall not be used in landscaping plans and erosion control.**

   c. **Monitor and rapidly implement control measures during construction to ensure early detection and eradication of weed invasions.**

9. **During construction and operation, the project owner shall conduct pesticide management in accordance with standard BMPs. The BMPs shall include non-point source pollution control measures. The project owner shall use a licensed herbicide applicator and obtain recommendations for herbicide use from a licensed Pest Control Advisor. Herbicide applications must follow EPA label instructions. Minimize use of rodenticides and herbicides in the project area and prohibit the use of chemicals and pesticides known to cause harm to non-target plants and wildlife. The project owner shall only use pesticides for which a "no effect" determination has been issued by the EPA's Endangered Species Protection Program for any species likely to occur within the project area or adjacent wetlands.**

Verification: All mitigation measures and their implementation methods shall be included in the BRMIMP and implemented. Implementation of the measures would be reported in the monthly compliance reports by the Designated Biologist. Within 30 days after completion of project construction, the project owner shall provide to the CPM, for review and approval, a written construction termination report identifying how measures have been completed.

PRE-CONSTRUCTION NEST SURVEYS AND IMPACT AVOIDANCE AND MINIMIZATION MEASURES FOR BREEDING BIRDS

BIO-17 Pre-construction nest surveys shall be conducted if demolition, or construction activities will occur from February 1 through August 31. The Designated Biologist or Biological Monitor shall perform surveys in accordance with the following guidelines:

1. **Surveys shall cover all potential nesting habitat and substrate within and directly around the perimeter of the project site.**

2. **At least one pre-construction survey shall be conducted no more than 3-days preceding initiation of construction activity. Additional follow-up surveys may be required if periods of construction inactivity exceed three weeks in any given area, an interval during which birds may establish a nesting territory and initiate egg laying and incubation.**

3. **If active nests are detected during the survey, a no-disturbance buffer zone (protected area surrounding the nest) shall be established around each nest. The size of each buffer zone shall be determined by the Designated Biologist in consultation with the CPM (in coordination with CDFW and USFWS). Nest locations shall be mapped using GPS.**

4. **If active nests are detected during the survey, the Designated Biologist or Biological Monitor shall monitor all nests with buffers at least once per week, to determine whether birds are being disturbed. If signs of disturbance or distress are observed, the Designated Biologist or Biological Monitor shall immediately implement adaptive measures to reduce disturbance. These measures may include, but are not limited to, increasing buffer size, halting disruptive construction activities in the vicinity of the nest until fledging is confirmed, or placement of visual screens or sound dampening structures between the nest and construction activity, reducing speed limits, replacing and updating noisy equipment, queing trucks to distribute idling noise, locating vehicle access points and loading and shipping facilities away from noise-sensitive receptors, reducing the number of noisy construction activities occurring simultaneously, placing noisy stationary construction equipment in acoustically engineered enclosures and/or relocating them away from noise-sensitive receptors, and/or reorienting and/or relocating construction equipment to minimize noise at noise-sensitive receptors**

5. **If active nests are detected during the survey, the Designated Biologist shall monitor the nest until he or she determines that nestlings have fledged and dispersed or the nest is no longer active. Activities that might, in the opinion of the Designated Biologist, disturb nesting activities (e.g., excessive noise, exposure to exhaust), shall be prohibited within the buffer zone until such a determination is made.**

Verification: Prior to the start of any pre-construction site mobilization, the project owner shall provide the CPM a letter-report describing the findings of any preconstruction nest surveys, including the time, date, and duration of the survey; identity and qualifications of the surveyor(s); and a list of species observed. If active nests are detected during the survey, the report shall include a map or aerial photo identifying the location of the nest and shall depict the boundaries of the proposed no disturbance buffer zone around the nest. Additionally, a monitoring plan shall be submitted that describes the project owner's proposal for documenting that the breeding bird(s) identified were not impacted, consistent with (4) and (5), above. The survey report and monitoring plan shall be submitted to the CPM for review and approval. Additional copies shall be provided to the CDFW and USFWS for review and comment. Approval of the plan is required before construction may commence. All impact avoidance and minimization measures related to nesting birds shall be included in the

BRMIMP and implemented. Implementation of the measures shall be reported in the monthly compliance reports by the Designated Biologist.

REFERENCES

APLIC (Avian Power Line Interaction Committee) 2006. Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006. Edison Electric Institute, APLIC, and the California Energy Commission, Washington, D.C. and Sacramento, CA.

_____ 2012. Reducing Avian Collisions with Power Lines: The State of the Art in 2012. Edison Electric Institute and APLIC. Washington, D.C.

Barber, J.R., K.R. Crooks, and K. Fristrup 2010. The costs of chronic noise exposure for terrestrial organisms. Trends Ecology and Evolution 25(3): 180–189.

Bayne, E.M., L. Habib and S. Boutin. 2008. Impacts of Chronic Anthropogenic Noise from Energy-Sector Activity on Abundance of Songbirds in the Boreal Forest. Conservation Biology 22(5): 1186-1193.

Bowman WD, Steltzer H. 1998. Positive feedbacks to anthropogenic nitrogen deposition in Rocky Mountain alpine tundra. Ambio 27: 514–517.

Bobbink, R,, M. Ashmore, S. Braun, W. Flückiger, and I. J.J. Van den Wyngaert. 2002. Empirical nitrogen critical loads for natural and semi-natural ecosystems: 2002 update. Section of Landscape Ecology, Department of Geobiology, Utrecht University.

BMNA 2014. Butterflies and Moths of North America. 2014. Web site: http://www.butterfliesandmoths.org/species/Danaus-plexippus . Accessed February 2014.

Brooks ML. 2003. Effects of increased soil nitrogen on the dominance of alien annual plants in the Mojave Desert. Journal of Applied Ecology 40(2): 344-353.

Brown, W.M., 1993. Avian collisions with utility structures: Biological perspectives. In: Proceedings: avian interactions with utility structures. Intern. Workshop, Miami, FL. Sponsored by APLIC and EPRI.

Burkett, E.E., R. J. Logsdon, and K.M. Fien 2007. Report to the California Fish and Game Commission: Status Review of California Brown Pelican (*Pelicanus occidentalis californicus*) in California. Calif. Dept. of Fish and Game, Wildlife Branch, Nongame Wildlife Program Report 2007-04. 26pp.+ appendices.

CEC 2005a. CEC (CEC-800-2005-001-CMF). El Segundo Power Redevelopment Project Commission Decision, dated 2/2005.

CEC 2014c. CEC/C. Stora (TN 201717). Data Responses 2/12/14 From NRG. Submitted to CEC on 2/12/2014

CEC 2014f. CEC (TN 202838) Huntington Beach Energy Project. Transcript of the July 21, 2014 Evidentiary Hearing.

Cal-IPC 2013. California Invasive Plant Council Invasive Plant Inventory 2013. Available at http://www.cal-ipc.org/paf/. Accessed February 2014.

California State Parks 1992. State of California Department of Parks and Recreation in coordination with County of Los Angeles Department of Beaches and Harbors. Dockweiler State Beach Draft General Plan. Prepared by Gruen Associates. March 1991.

CNPS (California Native Plant Society) 2013. Inventory of Rare and Endangered Plants (online edition, v8-01a). California Native Plant Society. Sacramento, CA. Available at: <http://www.cnps.org/inventory>

CNPSSD 2014 (California Native Plant Society San Diego Chapter). Species Profiles Coastal or Sea-cliff Buckwheat *Eriogonum parvifolium.* Available at < http://www.cnpssd.org/plantlistlinked.html>

CDFW (California Department of Fish and Wildlife) 2009. The Western Snowy Plover in the Los Angeles County, California: Annual Report 2008. Prepared by Ryan Consulting. January 2009.

_____ 2013. California Natural Diversity Database (CNDDB) Rarefind 4 Search (Government Version) of the Anaheim, Laguna Beach, Long Beach, Los Alamitos, Newport Beach, Orange, Seal Beach, and Tustin 7.5 minute USGS quadrangles. Accessed 01/09/13 and 09/16/13.

Cogswell, H.L. 1977. Water Birds of California. University of California Press, Berkeley and Los Angeles, CA. 399 pp.

Dooling, R.J. 2006. Estimating effects of highway noise on the avian auditory system. IN: Proceedings of the 2005 International Conference on Ecology and Transportation, Eds. Irwin CL, Garrett P, McDermott KP. Center for Transportation and the Environment, North Carolina State University, Raleigh, NC: pp. 30-31.

Dooling, R.J. and A.N. Popper 2007. The Effects of Highway Noise on Birds. Prepared for the California Department of Transportation, Division of Environmental Analysis. September 30.

ESPLLC 2000a-El Segundo Power, LLC (TN 17430). Application for Certification. Submitted to CEC on 12/21/2000

El Segundo Power Redevelopment Project (ESPRP). 2007a. Petition to Amend Final Commission Decision for the El Segundo Power Redevelopment Project. Submitted to the California Energy Commission on June 19, 2007.

Fenn, M.E., Baron, J.S., Allen, E.B., Rueth, H.M., Nydick, K.R., Geiser, L., Bowman,W.D., Sickman, J.O., Meixner, T., Johnson, D.W., P. Neitlich. 2003. Ecological effects of nitrogen deposition in the western United States. Bioscience 53(4): 404-420.

Francis, C.D., C.P. Ortega and A. Cruz. 2009. Noise Pollution Changes Avian Communities and Species Interactions. Current Biology 19: 1415–1419.

Habib, L., E.M. Bayne and S. Boutin. 2007. Chronic industrial noise affects pairing success and age structure of ovenbirds *Seiurus aurocapilla*. Journal of Applied Ecology 44: 176-184.

Halfwerk et al. 2011. Negative impact of traffic noise on avian reproductive success. Journal of Applied Ecology 48: 210-219.

Huenneke LF, Hamburg SP, Koide R, Mooney HA, Vitousek PM. 1990. Effects of soil resources on plant invasion and community structure in Californian serpentine grassland. Ecology 71: 478–491.HBEP 2012a. Huntington Beach Energy Project (tn 66003). Application for Certification Volume 1 & 2, dated June 2012. Submitted to Energy Commission/Docket Unit on 06/28/12.

Inouye RS, Tilman D. 1995. Convergence and divergence of old-field vegetation after 11 years of nitrogen addition. Ecology 76: 1872–1887.

Jones MM, et. al. 2004. Changes in vegetation and soil characteristics in coastal sand dunes along a gradient of atmospheric nitrogen deposition. Plant Biology 4: 598-605.

Kight C.R and Swaddle J.P. 2011. How and why environmental noise impacts animals: an integrative, mechanistic review. Ecology Letters 14: 1052–1061.

Knapp, P. and B. Peterson. 2009. Western snowy plover nesting at Bolsa Chica, Orange County, California. A report for the Fish and Wildlife Service Carlsbad Office. December.

LAWA 2012. Los Angeles World Airports. Facilities Management Group Environmental Services Division. Report of El Segundo Blue Butterfly Monitoring Activities in 2012 at the Los Angeles International Airport. Prepared by Richard A Arnold. December 2012.

_____ 2013. Facilities Management Group Environmental Services Division. LAX Dunes Preserve and the El Segundo Blue Butterfly Available at <http://www.lawa.org/uploadedFiles/LAWA >

LL 2013e- Locke Lord / J. McKinsey (TN 200464). Applicant's Responses to Data Requests in Set One (#1-83). Submitted to CEC on 9/12/2013.

_____ 2013o- Locke Lord / J. McKinsey (TN 201210). Data to Supplement Applicant's Responses to Data Request Set 1 (#34, 44, 57-60, 83). Submitted to CEC on 11/14/2013.

_____ 2013v- Locke Lord / J. McKinsey (TN 201467). Biological - Data to Supplement Project Owner's Response to Data Request 61. Submitted to CEC on 12/23/2013.

Massey, B.W., 1974. Breeding biology of the California least tern. Proceedings of the Linnean Society 72: 1-24.

Massey, B.W. and J.L. Atwood, 1981. Second-wave nesting of the California least tern: age composition and reproductive success. Auk 98: 595-605.

Medak, C. 2014a. Christine Medak, Fish and Wildlife Biologist, U.S. Fish and Wildlife Service. Personal communication to Ann Crisp of California Energy Commission, March 14, 2014.

_____ 2014b. Christine Medak, Fish and Wildlife Biologist, U.S. Fish and Wildlife Service. Personal communication to Ann Crisp of California Energy Commission, June 11, 2014.

NRG 2011a NRG / El Segundo Energy Center LLC BIO-7 Biological Resource Monthly Summary Reports June 2011. Submitted to CEC on as part of Monthly Compliance Report June 2011.

_____2011b NRG / El Segundo Energy Center LLC BIO-7 Biological Resource Monthly Summary Reports July 2011. Submitted to CEC on as part of Monthly Compliance Report. July 2011.

_____ 2012a NRG / El Segundo Energy Center LLC (TN 20650) Petition to Amend, dated April 2012. Submitted to CEC on 04/17/2012.

_____ 2013 NRG / El Segundo Energy Center LLC Post-Construction Operational Sound Level Study for Condition of Certification NOISE-6 El Segundo Energy Center Project (00-AFC-14C) Submitted to CEC on November 8, 2013.

_____ 2014c NRG / El Segundo Energy Center LLC/ G. Piantka (TN 201763) Email from NRG Energy in Response to CEC Staff Questions. Submitted to CEC on 2/20/2014.

Nye, L.B. 2014. Dr. L.B. Nye, Unit Chief, TMDLs & Standards, State Water Resources Control Board. Personal communication to Ann Crisp of California Energy Commission, September 30, 2014.

Pardo, L.H. et al. 2011. Effects of nitrogen deposition and empirical nitrogen critical loads for ecoregions of the United States. Ecological Applications 21:3049–3082.

Patton, R.T. 2002. California least tern breeding survey, 2000 season. California Department of Fish and Game, Species Conservation and Recovery Program Report, 2002-03. 24 pp. + app.

Plassmann, et. al. 2009. The effects of low levels of nitrogen deposition and grazing on dune grassland. Science of the Total Environment 407: 1391-1404.

Porter, E. 2014. Eric Porter, Fish and Wildlife Biologist. U.S. Fish and Wildlife Service. Telephone communication with Ann Crisp of the California Energy Commission. February 25, 2014.

Psomas. 2013. Results of 2013 Presence/Absence Surveys for El Segundo Blue Butterfly at the Ballona Wetlands Ecological Reserve, Playa Del Rey, Los Angeles County, CA. November 21, 2013. Irena Mendez, Ph.D. USFWS Recovery Permit TE218630.

Rillig et. al. 1998. Plant species specific changes in root-inhabiting fungi in a California annual grassland: Responses to elevated CO_2 and nutrients. Oecologia 113: 252–259.

Shaw Environmental Inc. 2007. Petition to Amend Final Commission Decision for the El Segundo Power Redevelopment Project. June.

Tonnesen, G., Z. Wang, M. Omary, and C. J. Chien. 2007. Assessment of Nitrogen Deposition: Modeling and Habitat Assessment. California Energy Commission, PIER Energy-Related Environmental Research. CEC-500-2005-032.

USDA (United States Department of Agriculture), Forest Service. 1997. Ecological Subregions of California. Scott Miles and Charles Goudey (editors). Pacific Southwest Division. R5-EM-TP-005. San Francisco.

USEPA (U.S. Environmental Protection Agency). 1971. Noise from Construction Equipment and Operations, US Building Equipment, and Home Appliances. Prepared by Bolt Beranek and Newman for USEPA Office of Noise Abatement and Control, Washington, DC.Urban Wildlands Group. 2004. Report on Southern Dune and Bluff Scrub Revegetation at Torrance Beach. Prepared by Travis Longcore, Rudi Mattoni, and Sarah Casia. September 23, 2004.

USFWS (U.S. Fish and Wildlife Service). 1980 – California least tern recovery plan. U.S. Fish and Wildlife Service, Region 1. Portland, OR. 58 pp

_____1998. Recovery Plan for the El Segundo Blue Butterfly. Portland, Oregon.

_____ 2007 – Recovery plan for the Pacific Coast population of the western snowy plover (*Charadrius alexandrus nivosus*). Volume 1: Recovery Plan. August.

_____ 2008. El Segundo Blue Butterfly (*Euphilotes battoides allyni*). 5-Year Review: Summary and Evaluation. Carlsbad Fish and Wildlife Office. March 2008.

_____ 2012 – Endangered and Threatened Wildlife and Plants; Revised Designation of Critical Habitat for the Pacific Coast Population of the Western Snowy Plover; Final Rule. Federal Register 77(118): 36728-36869.

_____ 2014. National Wetlands Inventory (NWI) website. U.S. Department of the Interior, Fish and Wildlife Service, Washington, D.C. http://www.fws.gov/nwi/

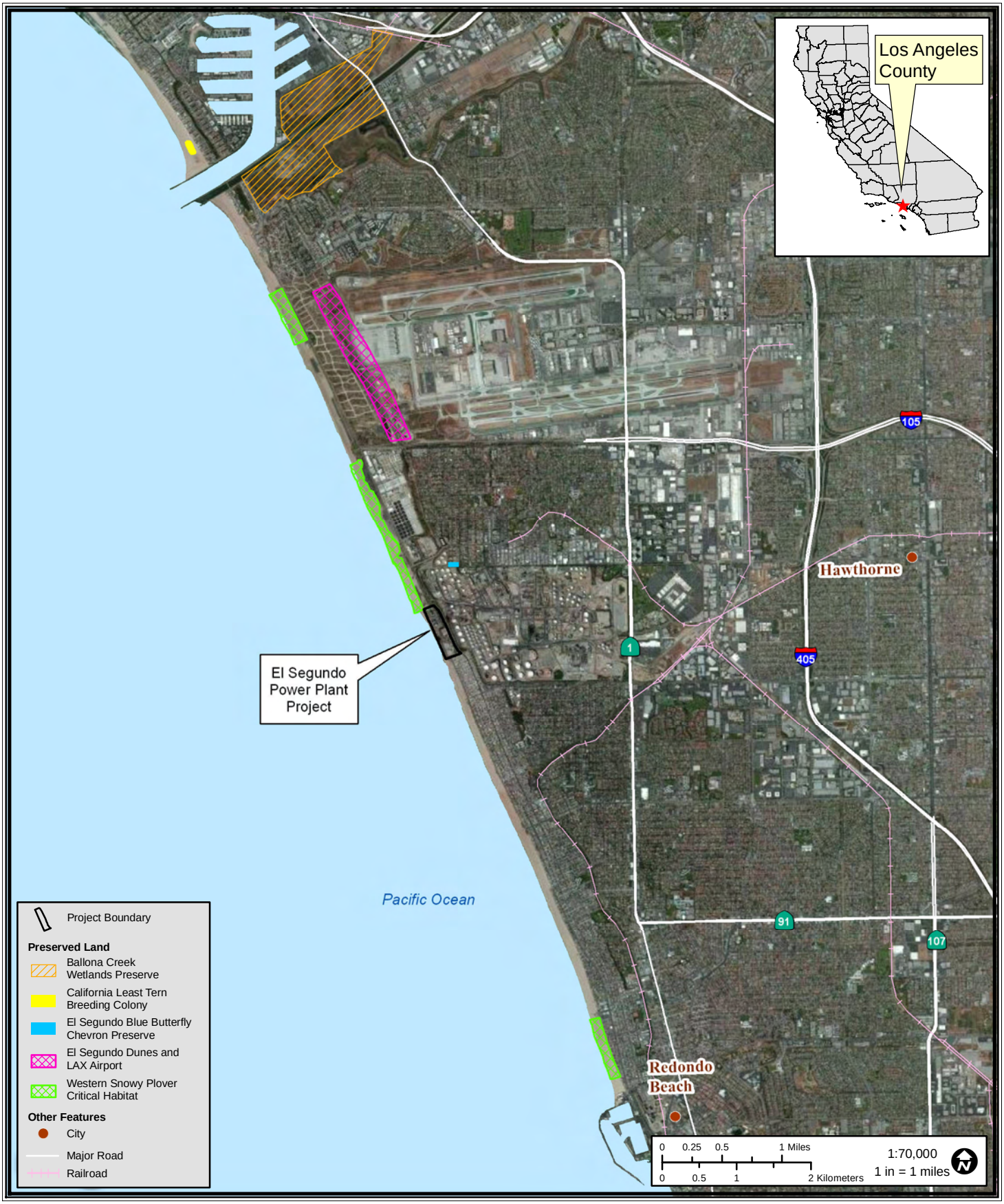
Weiss, SB. 1999. Cars, cows, and checkerspot butterflies: Nitrogen deposition and management of nutrient-poor grasslands for a threatened species. Conservation Biology 13: 1476–1486.

_____2006. Impacts of Nitrogen Deposition on California Ecosystems and Biodiversity. California Energy Commission, PIER Energy-Related Environmental Research. CEC-500-2005-165.

Xerces 2014. Xerces Society for Invertebrate Conservation. Available at http://www.xerces.org/monarchs/. Accessed February 2014.

BIOLOGICIAL RESOURCES- FIGURE 1

El Segundo Power Plant Project - El Segundo Preserved and Protected Lands



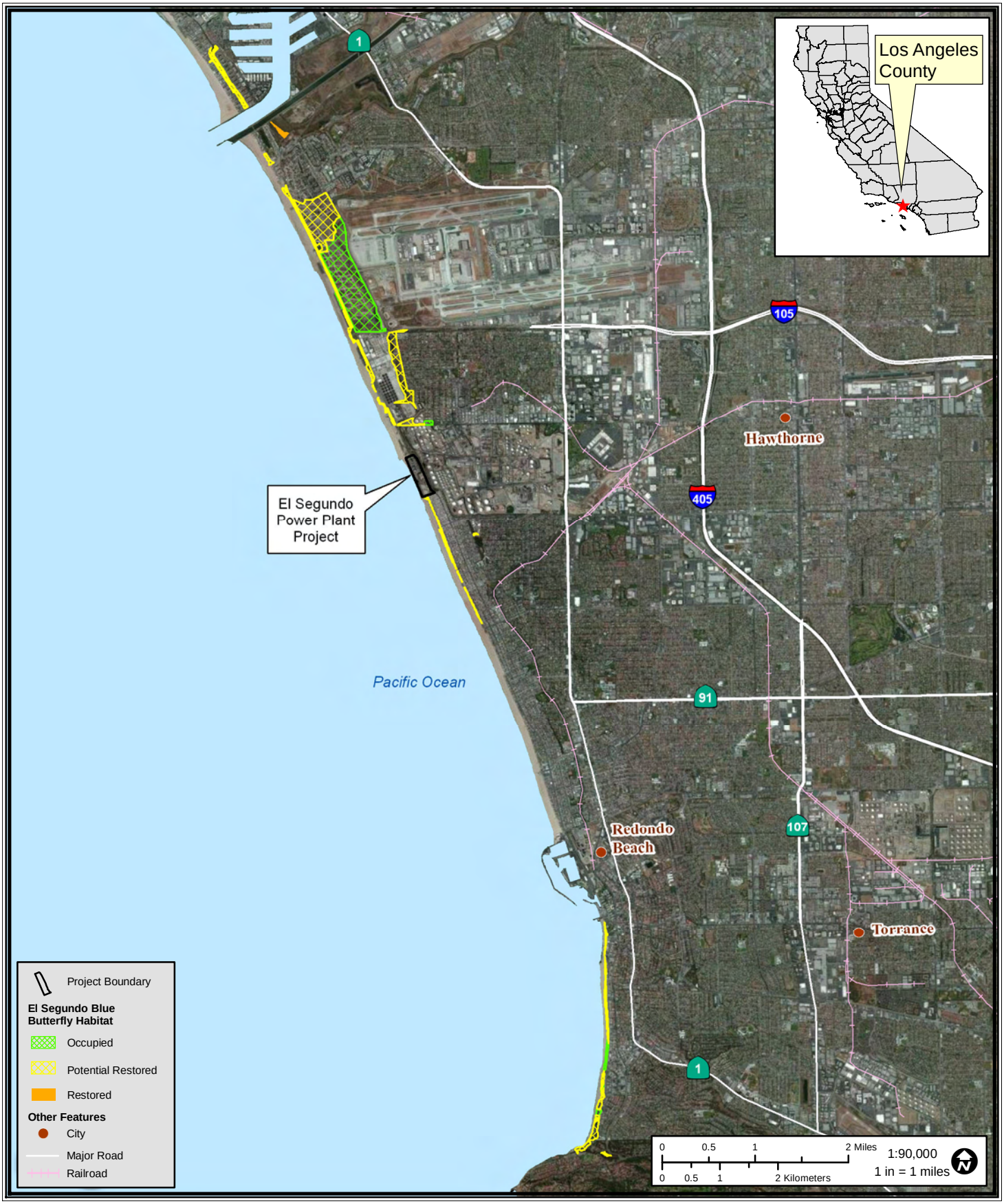
BIOLOGICIAL RESOURCES

CALIFORNIA ENERGY COMMISSION, SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCE: U.S. Fish and Wildlife Service - January 2017, Bing Aerial, OpenStreetMap January 2014.

BIOLOGICIAL RESOURCES- FIGURE 2

El Segundo Power Plant Project - El Segundo Blue Butterfly Habitat



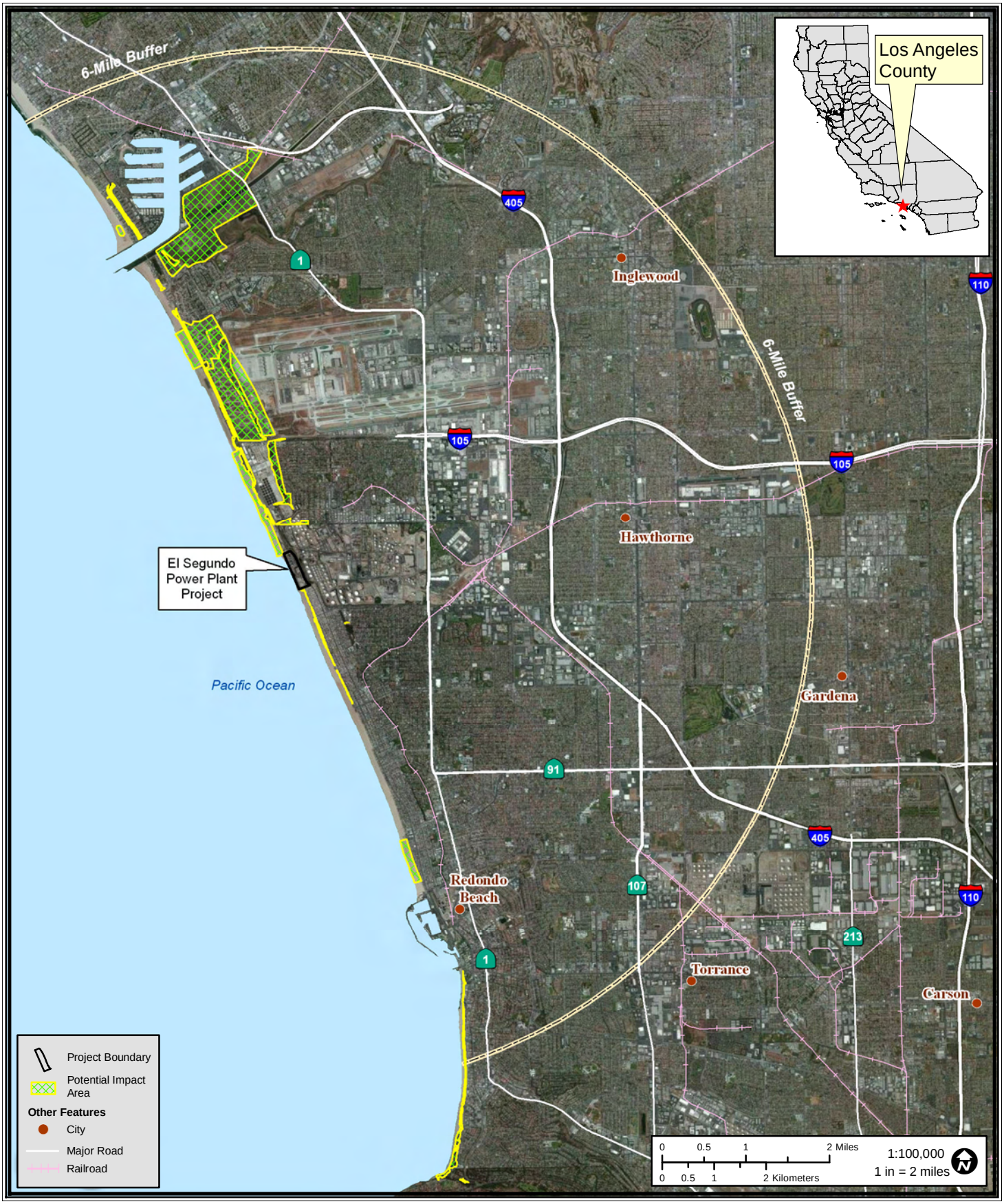
BIOLOGICIAL RESOURCES

CALIFORNIA ENERGY COMMISSION, SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCE: U.S. Fish and Wildlife Service - January 2017, Bing Aerial, OpenStreetMap January 2014.

BIOLOGICIAL RESOURCES- FIGURE 3

El Segundo Power Plant Project - Nitrogen Deposition Potential Impact Areas



BIOLOGICIAL RESOURCES

CALIFORNIA ENERGY COMMISSION, SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCE: U.S. Fish and Wildlife Service - January 2017, Bing Aerial, OpenStreetMap January 2014.

BIOLOGICAL RESOURCES-APPENDIX-1
NITROGEN DEPOSITION ANALYSIS

Testimony of Wenjun Qian, Ph.D., P.E.

INTRODUCTION

The following provides a technical description of the nitrogen deposition analysis for the El Segundo Power Facility Modification (ESPFM) project.

PROJECT DESCRIPTION

The facility owner of El Segundo Energy Center (ESEC) proposes to replace existing boiler Units 3 and 4 with a GE 7FA combined-cycle gas combustion turbine generator with heat recovery steam generator (HRSG) and two Rolls Royce Trent 60 simple-cycle gas turbines. Cooling for the combined-cycle unit would be provided by a Heller dry cooling tower system. The combined-cycle unit would also include a small auxiliary boiler rated at 36 MMBtu/hr to reduce start-up duration.

NITROGEN DEPOSITION

Nitrogen deposition is the term used to describe the input of reactive nitrogen species from the atmosphere to the biosphere. The pollutants that contribute to nitrogen deposition derive mainly from oxides of nitrogen (NOx) and ammonia (NH_3) emissions. NOx emissions (a term used for nitric oxide [NO] and nitrogen dioxide [NO_2]), generally the result of industrial or combustion processes, are much more widely distributed than NH_3. Reduced forms of nitrogen (NHx) are primarily emitted from intensive animal operations (e.g., dairies) and vehicles with the introduction of catalytic converters.

In the atmosphere NOx is transformed to a range of secondary pollutants, including nitric acid (HNO_3), nitrates (NO_3) and organic compounds, such as peroxyacetyle nitrate (PAN), while NH_3 is readily absorbed by surfaces such as water and soil as well as being rapidly transformed to ammonium (NH4+) by reaction with acidic compounds. Both the primary and secondary nitrogen-based pollutants may be removed by wet deposition (scavenging of gases and aerosols by precipitation) and by dry deposition (direct turbulent deposition of gases and aerosols) on the earth's surface.

NITROGEN DEPOSITION MODELS

Staff used the American Meteorological Society/Environmental Protection Agency Regulatory Model known as AERMOD to evaluate the potential nitrogen deposition impacts of this power plant project. AERMOD is a steady-state Gaussian plume model that incorporates air dispersion based on planetary boundary layer turbulence structure and scaling concepts, including treatment of both surface and elevated sources, and is applicable for use in both simple and complex terrain.

AERMOD does not account for the transformation of the nitrogen species which are time and reaction dependent. Therefore, it is a conservative model that overestimates deposition impacts. But, it is also approved for regulatory purposes for near-field impacts analyses (used by the Energy Commission and the air district), is most familiar to users and regulatory agencies, and it is generally used to estimate nitrogen deposition. Staff also used several assumptions with regard to nitrogen formation and deposition, which tend to further overestimate impacts. These assumptions include:

- 100 percent conversion of oxides of nitrogen (NOx) and ammonia (NH_3) into atmospherically derived nitrogen (ADN) within the exhaust stacks rather than allowing the conversion of NOx and NH_3 to occur over distance and time within the plume and atmosphere, which is beyond the scope of AERMOD;

- Depositional rates and parameters based upon nitric acid (HNO_3), which, of all the depositional species, has the most affinity for soils and vegetation and the tendency to adhere to what it is deposited on;

- Maximum settling velocities derived from the parameters for gaseous HNO_3 to produce maximum, or conservatively estimated, deposition rates;

- Emissions rates based upon the proposed facility's maximum potential to emit as required by California Environmental Quality Act (CEQA), rather than annually averaged likely emissions based on previous equipment performance and actual operations, in the calculation of nitrogen deposition; and

- Ammonia emissions are estimated to average 2.5 ppm, while the permit level is 5 ppm. In reality, ammonia emissions are generally less than 1 ppm over the life of the catalyst. Plant operators have an extraordinary impetus to avoid exceedances of their NOx permit limits, because they can be fined. Owners keep their catalyst clean and active, which keeps NOx level low and limits unreacted ammonia in the exhaust.

Assuming 100 percent of the NOx and NH_3 conversion to ADN within the exhaust stacks ignores the fact that it requires sunlight, moisture, and time for the nitrogen compounds to convert to ADN. Since staff analyzes habitat areas within a 6 mile radius of the project, it is unlikely that there would be sufficient time for the emitted nitrogen to convert to ADN. Therefore, it is likely that a less than significant amount of the project's nitrogen emissions would actually deposit on these habitat areas. However, at this time staff does not have refined data on the time needed for this conversion to occur. Therefore, staff conservatively assumes total conversion at the stack. The project would contribute to regional nitrogen deposition, but not at the levels predicted by AERMOD due to the limited time it takes for the plumes to travel to the habitat areas and the conservative assumptions used for nitrogen formation and deposition.

For average meteorological conditions, it would take the ESPFM plumes less than 2 hours to reach the furthest habitat of interest. However, in urban atmospheres, the oxidation rate of NOx to HNO_3 is approximately 20 percent per hour, with a range of 10 to 30 percent per hour (ARB 1986). Nighttime NOx oxidation rates are generally much lower than typical daytime rates. HNO_3 is readily taken up by soil, vegetation, and water surfaces. HNO_3 also reacts with gaseous NH_3 to form ammonium nitrate (NH_4NO_3), but the reaction is reversible and dependent on temperature, relative humidity, and concentrations of other pollutants. The ambient concentration of nitrate is limited by the availability of NH_3 which is preferentially scavenged by sulfate (Scire et al 2000).

On the other hand, because NH_3 is readily taken up by damp soils and vegetation and by water bodies, a significant portion of the emitted NH_3 can be deposited to vegetation depending on the type of land cover and on meteorological conditions (Hatfield and Follett 2008). NH_3 is also readily taken up by aerosol particles of sulfuric acid (H_2SO_4) to form ammonium sulfate ($(NH_4)_2SO_4$ [Metcalfe et al 1999]). But since most $(NH_4)_2SO_4$ particles deposit to ground by rain, it is likely that less than significant amount of the $(NH_4)_2SO_4$ particles would actually deposit on the habitat areas within the 6 mile radius of the project (the average rainfall in El Segundo is about 12.8 inches, with the majority falling between December and March). Instead, the $(NH_4)_2SO_4$ particles may travel hundreds and thousands of miles away from the project before they deposit on the earth's surface.

The Energy Commission's 2007 report *Assessment of Nitrogen Deposition: Modeling and Habitat Assessment* (Tonnesen et al 2007) reviewed two other air dispersion models, which can represent chemical speciation and formation of aerosols: CALPUFF and the Community Multiscale Air Quality (CMAQ) model for nitrogen deposition modeling. The CMAQ version used in the report sometimes produced relatively large numerical error thus the report concluded that CMAQ cannot be used reliably for single point source sensitivity simulations.

CALPUFF is a non-steady-state Lagrangian Gaussian puff dispersion model that simulates the effects of time- and space-varying meteorological conditions on pollution transport, transformation, and removal by modeling parcels of air as they move along their trajectories. Different from AERMOD, CALPUFF uses simplified chemistry to attempt to represent nitrogen partitioning with relatively low computational cost compared to CMAQ. The Energy Commission's 2007 report concluded that the CALPUFF model can be used to simulate nitrogen deposition, and its results were generally similar in magnitude to the CMAQ-simulated nitrogen deposition. However, CALPUFF is more appropriate for long-range transport (i.e., greater than 50 kilometers – at less than 50 km, and for complex terrain, it requires regulatory approval for its use by the relevant reviewing agency). In addition, CALPUFF allows users to define certain parameters in its meteorological processor, which makes it difficult to be standardized for regulatory review purposes at the current stage.

Both AERMOD and CALPUFF have strengths and weaknesses in modeling nitrogen deposition as mentioned above. Based on staff's modeling experience and U.S. Fish

and Wildlife Service's analysis on the Russell City Energy Center Project (USFWS 2010), nitrogen deposition rates at habitat areas within 6 miles of the project predicted from CALPUFF are usually an order of magnitude lower (i.e., $1/10^{th}$) than those from AERMOD. At this time, staff continues to believe AERMOD, with the overlay of conservative assumptions mentioned above, is the most conservative model to use for nitrogen deposition modeling.

NITROGEN DEPOSITION IMPACTS AND MITIGATION CALCULATIONS

In the 2002 Final Staff Assessment (FSA [CEC 2002a]) for the original El Segundo Power Redevelopment Project (00-AFC-14), staff concluded that the cumulative nitrogen deposition impact of then-projected ESEC facility would be less than significant. In the September 3, 2013 letter to Energy Commission[2], the facility owner stated that the projected NOx emissions from the future ESEC facility would be well below those analyzed in the 2002 FSA. The facility owner does not expect that the ESPFM would contribute significantly to the cumulative regional nitrogen deposition rates. However, staff noticed that the 2002 FSA did not include NH_3 in the total nitrogen emissions estimation. Staff requested the facility owner to include NH_3 in the total nitrogen emissions estimation for purposes of fully evaluating nitrogen deposition. The facility owner provided a detailed list of the nitrogen emissions (for both NOx and NH_3) associated with Energy Commission proceedings for ESEC (LL 2013o). The facility owner concluded that the total nitrogen emissions projected at the future ESEC facility would be less than the total nitrogen emissions that Energy Commission evaluated and authorized in previous ESEC proceedings. The facility owner believes further modeling analysis is not necessary and the modified ESEC facility would have a less-than-significant nitrogen deposition impact.

Staff is still concerned that different exhaust stack parameters from different units may result in higher nitrogen deposition impacts even though the nitrogen emissions would be lower. Thus Air Quality staff did its own analysis using AERMOD to evaluate and compare the nitrogen deposition impacts from the projected future ESEC units (Units 5 through 12 and auxiliary boiler) and those from the units remaining and approved by the 2010 Commission Decision to the Amendment (CEC 2010a), which include the remaining part of Unit 3 (based on the remaining megawatts to be replaced, more details are discussed in the **Air Quality** section), Unit 4, and Units 5 through 8. Staff found the nitrogen deposition impacts from the projected future ESEC facility would be less than significant as were the impacts for the ESEC facility certified by the 2010 Commission Decision.

Staff emphasizes that its modeling provides an overestimation of nitrogen deposition of the project, based on conservatisms layered upon conservatisms. However, it is the

[2] TN# 200394, Re: El Segundo Energy Center Petition to Amend (00-AFC-14C) Applicant's Objections to Certain Data Requests in Set One [#1-83] and Request for Extension to Submit Data Response 87 Contained in Set 2 (#84-87), dated September 3, 2013.

best tool we currently have that is accepted to provide a consistent, albeit extremely conservative result.

Staff used the conservatively modeled project nitrogen deposition impact and baseline nitrogen deposition (see more descriptions regarding baseline below) to compute the total nitrogen deposition rates on habitat areas. The results could be used to assess the extent of affected habitat to include areas where the total nitrogen deposition exceeds the critical load for each vegetation type. Staff considers that vegetation types below critical load are not significantly impacted by the project and does not require mitigation (see more details in the **Biological Resources** section). The baseline nitrogen deposition rates used in staff's analysis are based on emission inventory for calendar year 2002 (see more details below). Staff believes that additional conservatisms are introduced by using the 2002 baseline nitrogen deposition rates as discussed below.

California and South Coast Air Basin Baseline Nitrogen Deposition

The baseline nitrogen deposition rates used in staff's analysis are from the Energy Commission's 2007 report (Tonnesen et al 2007), which provided the total nitrogen deposition on a rather coarse 4-km (2.5-mile) grid (4 km x 4 km, or 16 km^2) throughout California. The report used emission inventory data that were previously developed through the Western Regional Air Partnership (WRAP) to simulate annual air quality and visibility for calendar year 2002. The source categories included for the calendar year 2002 include: area sources, point sources, mobile sources, non-road mobile sources, road dust, off shore sources, Mexico emissions inventory, and biogenic emissions for Volatile Organic Compounds (VOC).

However, the U.S. EPA's enforcement efforts, implemented through the State Implementation Plan (SIP) enforced by the regional air districts' Air Quality Management Plan (AQMP, see more details in the **Air Quality** section), have significantly reduced nitrogen emissions from mobile and stationary sources sectors since 2002, and will continue those downward trends. **Appendix Bio-1 Figures Ndep-1a** and **Ndep-1b** show that both the actual and forecasted nitrogen emissions calculated from the NOx and NH_3 emissions (red solid lines) for all sources in South Coast Air Basin decrease significantly from year 2000 to year 2035. The nitrogen emissions from the NOx and NH_3 emissions are based on the mass fraction of nitrogen in NOx and NH_3. It should be noted that nitrogen constitutes about 82 percent of NH_3 by weight while it only constitutes about 30 percent of NOx by weight.

The emissions from stationary sources, including electric generation facilities, are also presented (green dashed lines) in the figures for comparison. NOx emissions from the stationary sources only account for 8 to 22 percent of those from all sources and also show a steady decrease over the years. Although the NH_3 emissions from the stationary sources, mainly waste disposal and fuel combustion, show a slight increase, they only account for 22 to 47 percent of the total emissions from all sources. The majority of the NOx emissions come from mobile sources and the majority of the NH_3 emissions come from area wide sources such as livestock operations, fertilizer applications, and mobile sources.

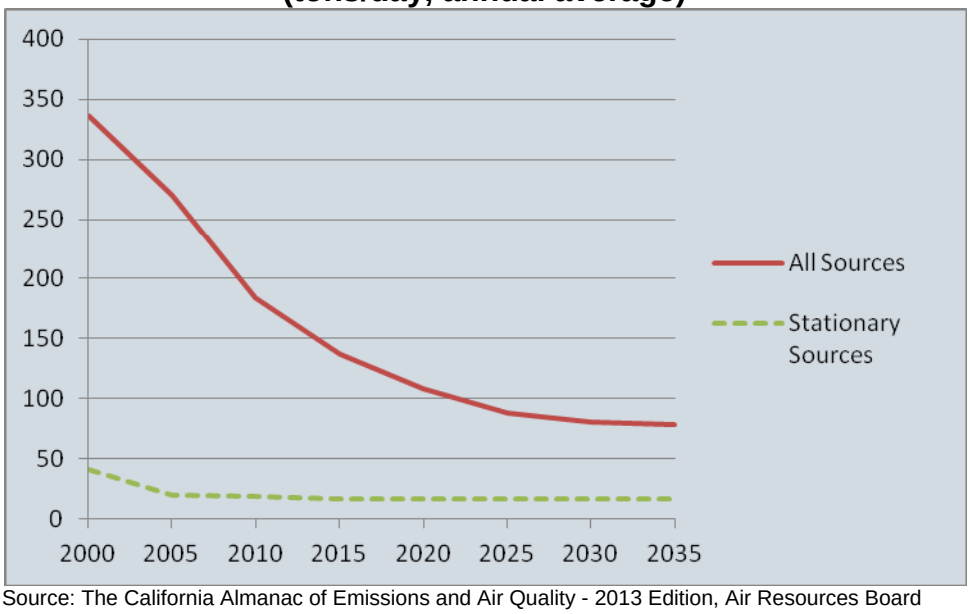
Appendix Bio-1 Figures Ndep-2 shows measured annual averaged nitrates (NO_3) and sulfates (SO_4) concentrations of dry particles at the San Gabriel monitoring station (located in South Coast Air Basin) from the Interagency Monitoring of Protected Visual Environments (IMPROVE) network. This is representative of depositional particles in ambient air at the station. The nitrates concentrations have decreased more than 50 percent from 2002 to 2012. The general trend of the sulfate concentrations is also decreasing. The sulfates concentrations have decreased about 30 percent from 2002 to 2012. This indicates that the reductions in the nitrogen emissions shown in **Appendix Bio-1 Figures Ndep-1a** and **Ndep-1b** are effective in reducing the background nitrates and sulfates in the South Coast Air Basin.

Considering the decreasing nitrogen emission inventory trend (an overall reduction of over 50 percent from 2002 to 2014, shown in **Appendix Bio-1 Figures Ndep-1a** and **1b** from the two trends for all sources combined), the relatively small contribution from the stationary sources, and the decreasing nitrates and sulfates concentration measurements, the use of 2002 emissions inventory in the baseline nitrogen deposition rates (as discussed in **Biological Resources**) probably overestimates baseline deposition by a factor of 2. Certain map zones that staff considered would be significantly impacted by the project, based on overestimated baseline as well as overestimated project impact, might have total nitrogen deposition below critical load. Thus the acreage of affected habitat is probably overestimated using 2002 baseline and conservatively estimated project impacts.

Staff assumes that total nitrogen loading is directly proportional to NOx and ammonia inventories. Since deposition pathways are complex and dependent on components such as time, humidity, sunlight exposure, and uniform mixing of needed reactants, deposition rates at the habitat areas near the project may be reduced more than the percentage change to nitrogen inventories.

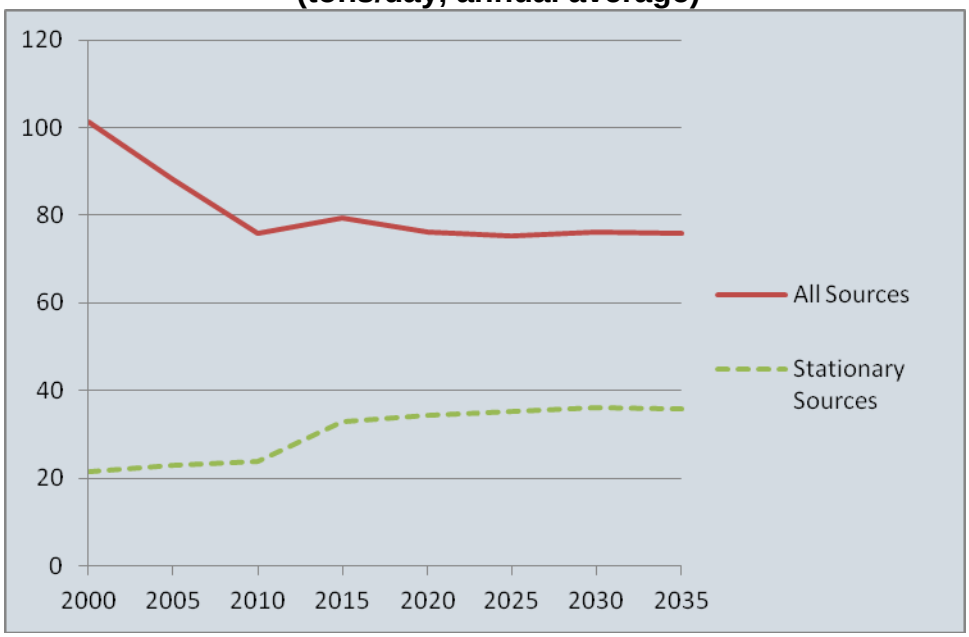
In addition, the South Coast Air Quality Management District (SCAQMD) implemented the Regional Clean Air Incentives Market or RECLAIM on January 1, 1994. Facilities subject to this program, such as ESEC, are required to purchase RECLAIM Trading Credits (RTCs) to offset their annual NOx emission increase in a 1-to-1 offset ratio. As a result, any new stationary source like ESPFM would not result in a net increase in NOx emissions basin wide (see details in the **Air Quality** section regarding ESPFM RECLAIM participation and compliance). In addition, since ESPFM would be located in Zone 1 (South Coast Air Basin coastal zone) RTCs may only be obtained from Zone 1. The resulting new emissions (potential NOx increases) from ESPFM and the required RTCs (NOx reductions or offsets) would be balanced to zero, or no net increase, annually in the more local coastal zone. So the baseline nitrogen from NOx would not change due to NOx emissions from ESPFM.

Appendix Bio-1 Figure Ndep-1a
Nitrogen Portion[a] of the NOx Emissions Trends in South Coast Air Basin (tons/day, annual average)



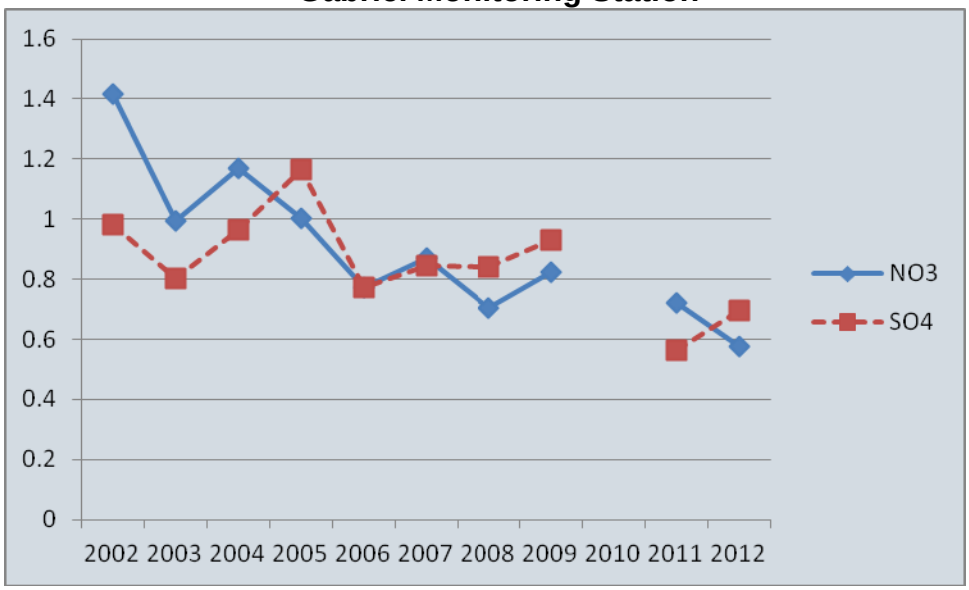
Source: The California Almanac of Emissions and Air Quality - 2013 Edition, Air Resources Board (ARB 2013) and Energy Commission staff analysis
Note: [a] The nitrogen portion of the NOx emissions is calculated based on the ratio between the molecular weight of nitrogen (14) and the molecular weight of NO_2 (46).

Appendix Bio-1 Figure Ndep-1b
Nitrogen Portion[a] of the NH_3 Emission Trends in South Coast Air Basin (tons/day, annual average)



Source: The California Almanac of Emissions and Air Quality - 2013 Edition, Air Resources Board (ARB 2013) and Energy Commission staff analysis
Note: [a] The nitrogen portion of the NH_3 emissions is calculated based on the ratio between the molecular weight of nitrogen (14) and the molecular weight of NH_3 (17).

Appendix Bio-1 Figure Ndep-2
Nitrates (NO_3) and Sulfates (SO_4) Concentrations ($\mu g/m^3$) Measured at San Gabriel Monitoring Station



Source: Interagency Monitoring of Protected Visual Environments (IMPROVE) and Energy Commission staff analysis

CONCLUSIONS

While staff can calculate a nitrogen deposition rate from the project, staff believes the modeling tools and background deposition rates identify a much higher rate of nitrogen deposition than is reasonably expected to occur. For more information on this, refer to the **Biological Resources** section of this document.

The total nitrogen emissions projected at the future ESEC facility would be less than the total nitrogen emissions that Energy Commission evaluated and authorized in previous ESEC proceedings. Staff's own analysis in the **Biological Resources** section shows that the nitrogen deposition impacts from the projected future ESEC facility would be less than significant as were the impacts for the ESEC facility certified by the 2010 Commission Decision.

Staff believes that because AERMOD does not account for the transformation of the nitrogen species, which is time and reaction dependent, the nitrogen deposition impacts of the project have been overestimated by as much as a factor of 10 using AERMOD. Further, the nitrogen emission inventory in the South Coast Air Basin has decreased more than 50 percent from 2002 to 2014 for oxides of nitrogen and ammonia combined. The use of the 2002 emissions inventory in the baseline nitrogen deposition rates probably overestimates baseline nitrogen deposition by a factor of 2. In addition, ESPFM is required to purchase RTCs to offset their annual NOx emissions on a 1-to-1 offset ratio. ESPFM would not result in a net increase in NOx emissions in South Coast Air Basin coastal zone. Lastly, ammonia emissions were modeled at a rate 2.5 times higher in the modeling than what is reasonably expected.

REFERENCES

ARB 1986 – California Air Resources Board. The Effects of Oxides of Nitrogen on California Air Quality. By Technical Support Division State of California Air Resources Board. Report Number: TSD-85-01. March 1986.

ARB 2013 – California Air Resources Board. The California Almanac of Emissions and Air Quality – 2013 Edition. Prepared by the staff of the Air Quality Planning and Science Division, California Air Resources Board. October 2013.

CEC 2002a - CEC (TN 26655). Final Staff Assessment – El Segundo Redevelopment Project, dated 9/2002.

CEC 2008 – California Energy Commission, Staff Analysis - El Segundo Redevelopment Project, dated June 12, 2008.

CEC 2010a - CEC (CEC-800-2010-015). El Segundo Power Redevelopment Project Amendment Commission Decision, dated 6/2010.

Hatfield, Jerry L., and Ronald F. Follett, 2008. Nitrogen in the Environment Sources, Problems, and Management, Second Edition, Academic Press, 2008.

LL 2013e - Locke Lord / J. McKinsey (TN 200464). Applicant's Responses to Data Requests in Set One (#1-83). Submitted to CEC on 9/12/2013.

LL 2013o - Locke Lord / J. McKinsey (TN 201210). Data to Supplement Applicant's Responses to Data Request Set 1 (#34, 44, 57-60, 83). Submitted to CEC on 11/14/2013.

Metcalfe, S.E., D. Fowler, R.G. Derwent, M.A. Sutton, R.I. Smith and J.D. Whyatt, 1999, Spatial and Temporal Aspects of Nitrogen Deposition, in The Impact of Nitrogen Deposition on Natural and Semi-Natural Ecosystems, edited by Simon J. Langan, Kluwer Academic Publishers, 1999.

NRG 2013a - NRG / El Segundo Energy Center LLC (TN 70442) Petition to Amend, dated April 2013. Submitted to CEC on 04/23/2013.

Scire, Joseph S., David G. Strimaitis, Robert J. Yamartino, 2000. A User's Guide for the CALPUFF Dispersion Model (Version 5). Earth Tech, Inc., Concord, MA, 2000.

Tonnesen, G., Z. Wang, M. Omary, and C. J. Chien, 2007. Assessment of Nitrogen Deposition: Modeling and Habitat Assessment. California Energy Commission, PIER Energy-Related Environmental Research. CEC-500-2005-032.

USFWS 2010 - United States Fish and Wildlife Service, Endangered Species Informal Consultation on the Proposed Russell City Energy Center Project by Calpine/GE Capital, city of Hayward, Alameda County, California, dated January 25, 2010.

CULTURAL RESOURCES

Thomas Gates, Melissa Mourkas, and Gabriel Roark[3]

SUMMARY OF CONCLUSIONS

Staff's analysis of the proposed amendment to the El Segundo Energy Center (ESEC) license, called the El Segundo Power Facility Modification (ESPFM), concludes that the proposed amendment would not result in impacts to known archaeological resources that meet the California Environmental Quality Act's definitions of historical or unique archaeological resources. The project area analysis indicates that construction-related ground disturbance could encounter as-yet-unidentified, buried archaeological resources. Staff concludes that the existing license Conditions of Certification **CUL-1** through **CUL-7,** are appropriate and sufficient to reduce potential archaeological resource impacts. Staff proposes to modify the scope of Condition of Certification **CUL-6**, which requires archaeological and Native American monitoring during construction, to limit monitoring during construction to those portions of the proposed amendment that would require excavation into non-fill, native soils or sediments. Condition of Certification **CUL-8** has been satisfied during previous project construction and is not relevant to the present amendment.

As a result of ethnographic research, staff concludes that there are no ethnographic resources that would be impacted by the proposed project. The ethnographic background information provided in this assessment provides an ethnological context for the other cultural resources disciplines that inform this cultural resources section.

As a result of the built-environment research and investigation, staff concludes that no historic built environment resources would be impacted by the proposed project. Results of a literature search as requested in Data Request 78, dated August 12, 2013, included a number of built environment historic resources within the Project Area of Analysis (PAA) for the project and project laydown areas, but staff concludes that there would be no significant impacts from the project on those resources.

INTRODUCTION

This cultural resources assessment identifies the potential impacts of the proposed ESPFM, a proposed amendment to the ESEC license, on cultural resources. Cultural resources are defined under state law as buildings, sites, structures, objects, areas, places, records, manuscripts, and historic districts (Cal. Code Regs., tit. 14, §§ 4852a, 5064.5(a)(3); Pub. Resources Code, §§ 5020.1(h, j), 5024.1[e][2, 4]). Three broad classes of cultural resources are considered in this assessment: prehistoric, ethnographic, and historic.

Prehistoric archaeological resources are those materials relating to prehistoric human occupation and use of an area. These resources may include sites and deposits, structures, artifacts, rock art, trails, and other traces of Native American human

[3] Gates, ethnographic resources; Mourkas, historic built environment resources; Roark, archaeological resources.

behavior. In California, the prehistoric period began over 12,000 years ago and extended through the eighteenth century until 1769, when the first Europeans settled in California.

Ethnographic resources are those materials important to the heritage of a particular ethnic or cultural group, such as Native Americans or African, European, or Asian immigrants. They may include traditional resource collecting areas, ceremonial sites, topographic features, value-imbued landscapes, cemeteries, shrines, or ethnic neighborhoods and structures. Ethnographic resources are variations of natural resources and standard cultural resource types. They are subsistence and ceremonial locales and sites, structures, objects, and rural and urban landscapes assigned cultural significance by traditional users. The decision to call resources "ethnographic" depends on whether associated peoples perceive them as traditionally meaningful to their identity as a group and the survival of their lifeways.[4]

Historic-period resources are those materials, archaeological and architectural, usually associated with Euro-American exploration and settlement of an area and the beginning of a written historical record. They may include archaeological deposits, sites, structures, traveled ways, artifacts, or other evidence of human activity. Under federal and state requirements, historical cultural resources must be 50 or more years old to be considered of potential historic importance; the Office of Historic Preservation (OHP 1995), however, encourages the consideration of resources 45 years or older at the time of analysis, owing to the sometimes lengthy planning and environmental review processes, during which time a more recent resource could reach the 50-year mark. A resource less than 50 years of age may be historically important if the resource is of exceptional importance.

For the proposed ESPFM, staff provides an overview of the environmental setting and history of the project area, an inventory of the cultural resources identified in the project vicinity, and an analysis of the potential impacts from the proposed amendment using criteria from the California Environmental Quality Act (CEQA). The primary concern is to ensure that all potential impacts are identified and that conditions are set forth that ensure that impacts are mitigated below the level of significance.

If cultural resources are identified, staff determines whether there may be a project-related impact to them. If the cultural resources cannot be avoided, staff determines whether any of the impacted resources are eligible for the California Register of Historical Resources (CRHR). If impacted resources are eligible for the CRHR, staff recommends mitigation measures that ensure that impacts to the identified cultural resources are reduced to a less-than-significant level.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

Projects proposed before the Energy Commission are reviewed to ensure that the proposed facilities would comply with all applicable laws, ordinances, regulations, and standards (LORS) (Pub. Resources Code, § 25525; Cal. Code Regs., tit. 20, §§

[4] A “lifeway,” as used herein, refers to any unique body of behavioral norms, customs, and traditions that structure the way a particular people carry out their daily lives.

1702[n], 1744[b]). See **Cultural Resources Table 1** for a summary of the LORS applicable to the project.

Cultural Resources Table 1
Laws, Ordinances, Regulations, and Standards

Applicable Law	Description
State	
Pub. Resources Code, §§ 5097.98(b) and (e)	Requires a landowner on whose property Native American human remains are found to limit further development activity in the vicinity until s/he confers with the Native American Heritage Commission (NAHC)-identified Most Likely Descendents (MLDs) to consider treatment options. In the absence of MLDs or of a treatment acceptable to all parties, the landowner is required to reinter the remains elsewhere on the property in a location not subject to further disturbance.
Pub. Resources Code, § 5097.99	§ 5097.99 prohibits the acquisition, possession, sale, or dissection with malice or wantonness of Native American remains or artifacts taken from a Native American grave or cairn.
Health and Safety Code, § 7050.5	This code makes it a misdemeanor to disturb or remove human remains found outside a cemetery. It also requires a project owner to halt construction if human remains are discovered and to contact the county coroner.
Local	
city of El Segundo Local Coastal Program (LCP)	The issues identification report of the LCP states that development impacts on archaeological and paleontological resources shall be mitigated. (El Segundo 1980.)
city of El Segundo Title 15; Chapter 14 Municipal Code	The purpose of this Chapter is to promote the public health, safety and general welfare by providing for the identification, protection, enhancement, perpetuation and use of historic buildings and structures within the City that reflect special elements of the City's historical heritage.

SETTING

Information provided regarding the setting of the proposed ESPFM places it in its geographical and geological contexts and specifies the technical description of the amendment. Additionally, the archaeological, ethnographic, and historical, backgrounds provide the contexts for the evaluation of the historical significance of any identified cultural resources within the project area of analysis (PAA).

REGIONAL SETTING

The proposed ESPFM would be located on property occupied by the ESEC in the city of El Segundo, Los Angeles County. The proposed facility modifications and the following construction parking and laydown areas would be located in El Segundo: Hyperion, Chevron Marine Terminal, and Kramer. Three other construction parking and laydown areas would be located in other jurisdictions: 190th Street in the city of Gardena, Dockweiler State Beach within the County of Los Angeles, and LAX-Pershing at Los Angeles International Airport in the city of Los Angeles. (ESEC 2013a:Figure 2-10.) These proposed project components are all located in the Los Angeles Plain or Basin. The Los Angeles Basin is situated at the northwestern end of the Peninsular Ranges

geomorphic province. This geomorphic unit is located west of the San Andreas Fault and contains as boundary ranges the San Jacinto, Santa Rosa, and Laguna mountains; the Santa Ana Range is a prominent relief feature closer to the coast. The Los Angeles Basin receives the bulk of its runoff and sediment from the Santa Ana Range and Santa Monica Mountains through the San Gabriel, Los Angeles, and Santa Ana rivers. (Schoenherr 1992:10.) The Los Angeles Basin is an alluvial plain that is generally underlain by deep sediments dating to the Holocene Epoch[5].

PROJECT, SITE, AND VICINITY DESCRIPTION

The proposed project site and three off-site construction parking and laydown areas, are located in the urban, beachside city of El Segundo. The project site is surrounded on the north and east by industrial properties, the west by Dockweiler State Beach and the Pacific Ocean, and the south by a residential neighborhood in the city of Manhattan Beach. The other off-site construction laydown areas are located in Gardena, Los Angeles County, and the city of Los Angeles in recreational and mixed-use residential and commercial settings.

Environmental Setting

Identifying the kinds and distribution of resources necessary to sustain human life in an environment, and the changes in that environment over time is central to understanding whether and how an area was used during prehistory and history. During the time that humans have lived in California, the region in which the proposed ESPFM is located has undergone several climatic shifts. These shifts have resulted in variable availability of vital resources, and that variability has influenced the scope and scale of human use of the project vicinity. Consequently, it is important to consider the historical character of local climate change, or the paleoclimate, and the effects of the paleoclimate on the physical development of the area and its ecology.

Overview

The proposed project site is situated at elevations ranging from 18 to 90 feet above sea level (asl) on Santa Monica Bay. The proposed offsite construction parking and laydown areas would be located in densely settled areas in Gardena, Los Angeles County, and the city of Los Angeles. Current land uses in the project vicinity include residential, electrical generation, oil extraction and refinement, other industrial, wildlife habitat preserves, parklands and open space, landfill, and beaches. (ESEC 2013a:2-2.)

Paleoclimate and Ecology

The paleoclimate and ecology of the project vicinity is complex, belied by the fact that former climatic and ecological conditions in the area generally conform to the long-standing, three-part paleoclimatic framework for arid western United States. In this framework, the Holocene began with a moderately cool and moist period known as the Anathermal (ca. 10,000–7500 B.P.). Subsequently, the California climate appears to have warmed and dried during the Altithermal (ca. 7500–4000 B.P.). During the Medithermal (ca. 4000 B.P.–present), moisture and temperature conditions resembled

[5] The Holocene Epoch is a unit of time used in geology and archaeology to designate the period between the current day and 11,700 B.P. (Cohen et al. 2013). The term “B.P.” (Before Present) is an international dating convention that refers to the year 1950 as the present.

those of today. (Moratto et al. 1978:148.) The wet winter/dry summer climate of southern California is thought to have persisted through much of these three climatic periods and may be about 160,000 years old (Masters and Aiello 2007:40). Locally, however, climate and ecology changed considerably over the last 12,000–10,000 years.

Paleobotanical studies suggest that a warming trend commenced during the terminal Pleistocene Epoch and continued into the Early Holocene[6]. The amount of conifer pollen decreased and was accompanied by a simultaneous increase in the quantity of oak, chaparral, and herb pollen around 14,000–10,000 B.P. The rate of increase appears to have been rapid. (West et al. 2007:25.)

The nineteenth-century climate on the southern California coast was a little different than today's climate. Northwesterly winds dominated then as today, although southeasterly winds were more frequent and intense, likened to hurricanes. The turn of the twentieth century heralded reduced influence of southeasterly winds and the Little Ice Age ended with five El Niño[7] events in a 20-year period. (Engstrom 2006:850–851.)

The warming trend—called the Altithermal or Holocene Climatic Optimum—continued throughout the Early Holocene, although cooling events are noticeable as well. For instance, between 8000 and 7000 B.P., the project vicinity is inferred to have been warmer and wetter than today (Altschul et al. 2007:35), but is followed by a cooler period about 7500–6800 B.P. During this latter interval, red abalone (*Haliotis rufescens*) became more abundant than black abalone in the intertidal zone (*H. carcherodii*), illustrating that climate change affects animal as well as plant life—changes which might be represented in the archaeological record. Overall, mean summer temperatures were higher and precipitation lower than present conditions. (Vellanoweth and Grenda 2002:75–77, 80.)

During the Middle Holocene (7000–4000 B.P.), the southern California climate remained predominantly warm and dry (Altschul et al. 2007:35; Vellanoweth and Grenda 2002:78). Dated pollen profiles illustrate this trend, with species favoring cooler and wetter settings (pine and fern) giving way to drought- and heat-tolerant plants (oaks, grasses, goosefoots [*Chenopodium* spp.], and the sunflower family [Compositae][8]) throughout this interval (Vellanoweth and Grenda 2002:77–78). Despite the warm and dry conditions of the Middle Holocene, locally sufficient stream flows were available to freshwater marshes, such as Ballona Wetlands (Altschul et al. 2007:35). In such instances, indicator species of wetter conditions were abundant, despite an overall arid trend (Vellanoweth and Grenda 2002:77–78).

By 5000–4500 B.P., at the end of the Middle Holocene, sea level reached approximately present-day level, changing the character of near-ocean habitats going into the Late Holocene (4000 B.P.–present). Sea level rise increased tidal influence and

[6] Geoscientists divide the Holocene Epoch into three broad divisions: Early (11,500–7550 B.P.), Middle (7950–1450 B.P.), and Late (1450 B.P.–present).

[7] El Niño events are complex cycles of droughts associated with changes in sea level, wind, and temperature (Ilahiane and Altschul 2002:35).

[8] Grass and chenopod pollen, however, was relative sparse throughout sample taken (Vellanoweth and Grenda 2002:78).

direct reach into near-shore wetlands, changing water bodies like Ballona Wetlands from freshwater to largely saltwater features. Wetland salinity was moderated during pulses of freshwater inputs (Altschul et al. 2005:286.)

The information presented above shows that the project vicinity was habitable for humans throughout the last 12,000 years, although local conditions—such as the amount of saltwater and types of vegetation present in Ballona Lagoon—required early inhabitants to vary their residences and resource-procurement activities (see "Prehistoric Setting" below). Human use of the project vicinity was also affected by evolving landforms, as is the preservation potential of its archaeological remains.

Geology

The purposes of this brief geological context are to define how and when the underlying soils and sediments developed, and provide a baseline physical context to assess whether surface and buried archaeological materials are likely to occur in the PAA. The proposed project site is situated on placed fill and Quaternary[9] eolian (wind-deposited) sediments, according to the **Geology and Paleontology** section of this FSA. Quaternary sediments in the PAA are believed to range from Holocene to Pleistocene in age, which would cover the whole range of human occupation in the project vicinity (see "Prehistoric Setting" below).

The project vicinity contains most of the major landforms characteristic of the Los Angeles Basin. This basin is an alluvial plain ringed by the San Jacinto, Santa Rosa, and Laguna mountains, drained principally by the San Gabriel, Los Angeles, and Santa Ana rivers. These streams each deposit sediments from the mountains, forming separate alluvial fans as they make their way seaward. Closer to the proposed project site, the dominant landforms are beaches and low hillock dunes (foredunes) (Engstrom 2006:852).

The project site itself exhibits a three-part geological or stratigraphic sequence within the expected depths of proposed excavation. From shallowest to deepest, these broad geological units are: placed fill, dune sand, and older alluvium (Ninyo & Moore 2007a:4, Appendix A; Ninyo & Moore 2007b:Appendix A; Ninyo & Moore 2010:7). Placed fill represents construction backfill material, or nonnative sediments. Dune sands in the PAA are associated with the wind-blown sediments that make up the El Segundo Sandhills and its predecessors buried underneath. Geologists regard the dune sands as Holocene in age. In contrast, the older alluvium below the dune sands is regarded as Pleistocene in age.

Prehistoric Setting

The proposed project is located in the Northern California Bight (or Northern Bight, from Palos Verdes Peninsula northward to the vicinity of Vandenberg Air Force Base (Glassow et al. 2007:191, Figure 13.2). The prehistoric archaeology of the project

[9] The Quaternary Period encompasses the Pleistocene (2.588 million years ago–11,700 B.P.) and Holocene (11,700 B.P.–present day) epochs (Cohen et al. 2013). Without further description, therefore, Quaternary geologic formations may be taken to date anywhere from 2.588 million years ago to the present day.

vicinity is understood with respect to regional and local archaeological research: that of the Northern Bight and Ballona Wetlands, respectively.

Glassow et al. (2007) divide Northern Bight prehistory into six periods:

1. Early Occupations/Paleocoastal Tradition (ca. 12,950–8950 cal B.P.)
2. Millingstone Horizon (ca. 8950–6950 cal B.P.)
3. Intermediate Cultures/Maritime Lifeway (6450–3950 cal B.P.)
4. Middle/Late Holocene Transition (3950–1949 cal B.P.)
5. Unnamed Period (1949–950 cal B.P.)
6. Unnamed/Protohistoric Period (950 cal B.P.–missionization)

Paleo-Coastal Tradition (ca. 12,950–8950 cal B.P.)

Evidence of early occupations, such as a Paleo-Coastal or Paleoindian tradition in the Northern Bight is relatively scant. What archaeologists know of this early period of prehistory comes from a handful of archaeological sites:

- Arlington Springs Woman (CA-SRI-173): ca. 12,950 cal B.P.
- CA-SBA-1951: Clovis projectile point[10] (ca. 13,450–10,950 cal B.P.)
- Daisy Cave (CA-SMI-261): 11,450 and 9950–8950 cal B.P.
- Buried midden[11] on Santa Rosa Island: 9250 cal B.P.
- Surf Site (CA-SBA-931): ca. 9950–9450 cal B.P.
- Malaga Cove Site (CA-LAN-138), Palos Verdes Peninsula, 9950–8950 cal B.P. (Glassow et al. 2007:191–192.)

Archaeological traces from this time period indicate that Paleo-Coastal people ate shellfish, fished with gorge and line by about 9750 cal B.P., and left relatively few archaeological materials on the landscape. No milling equipment (ground-stone tools) have been found at Paleo-Coastal sites in the Northern Bight. Archaeologists are uncertain whether or how the Paleo-Coastal Tradition and Millingstone Horizon (discussed below) are related. (Glassow et al. 2007:192.) The rarity of Paleo-Coastal archaeological sites might have been caused by the rapid deposit of sediment into alluvial fans beginning about 7000 B.P. and inundation of older landforms by rising sea level through 5000 B.P. (Altschul et al. 2007:35). Additionally, the discovery of site P-19-2345 partially buried beneath El Segundo Sandhills north of the project site, on top of

[10] Clovis points are a distinctive form of projectile point that frequently was fluted along its faces and possessed of a concave base. Clovis points seem to date to the 13,450–10,950 cal. B.P. interval across North America. (Cordell 1997:81; Rondeau et al. 2007:68.)

[11] Midden is organic habitation debris, usually dark in color and associated with the disposal of food and human waste over variable periods of time.

presumably Pleistocene-age sediments, suggests that dune development and wind-blown sands could harbor additional buried Paleo-Coastal sites (Bissell 1995b:1; Los Angeles 2004:4-818, 4-819).

Millingstone Horizon (ca. 8950–6950 cal B.P.)

Beginning late in the Early Holocene and continuing into the Middle Holocene (8950–6950 cal B.P.), the Northern Bight's archaeological record presents a new culture and adaptive pattern known as the Millingstone Horizon, which persisted in some areas until 5400 cal B.P. (Glassow et al. 2007:192, 194). The Millingstone Horizon is a distinctive and widespread archaeological complex, found west of the Sierra Nevada from the Baja Peninsula north to Clear Lake (Jones 2008:Figure 1). The appearance of this archaeological horizon in the Northern Bight corresponds with the expansion of the southern coast's human population. Millingstone sites are recognizable by abundant millingstones and handstones (locally referred to as metates and manos, respectively). Most of the approximately 40 radiocarbon-dated Millingstone sites are located on or near the coast. The relative lack of interior Millingstone traces might not reflect a low inland population density. Rather, Millingstone archaeology in the interior might be buried under younger soils and sediments, or sometimes cannot be firmly dated to the Millingstone period for lack of dateable materials, such as bone and charcoal. (Glassow et al. 2007:194.)

Limited paleoenvironmental data are available for Millingstone Horizon archaeology in the region. Oxygen isotope data from a marine sediment core indicate that ocean temperatures and marine life productivity were higher than present conditions during the Millingstone period. Some pollen data suggest that Millingstone-period vegetation communities were similar to those of today. Sea level was still rising between 8950 and 6950 cal B.P., but more slowly than before the Millingstone period. Early Holocene sea-level transgression into canyon mouths expanded the number and range of lagoons, estuaries, and tidal wetlands. (Glassow et al. 2007:194.)

The volume of Millingstone deposits and the number of artifacts suggest repeat site use and longer residential intervals than inferred for mainland Paleo-Coastal Tradition sites (Glassow et al. 2007:194). Typical Millingstone Horizon artifacts, in addition to abundant handstones and millingstones, include other stone plant-processing tools. Hunting implements, such as dart and spear points, are uncommon. When present, projectile points are generally leaf-shaped. (Jones 2008:138.)

Features found at Millingstone sites include earth ovens for cooking yucca plants, and large amounts of fist-sized and larger cobbles arranged in sheets with millingstones and handstones mixed in. Many cobbles in these rock accumulations have been burned, suggesting use in hearths or ovens. Also characteristic of open-coast Millingstone sites are dense accumulations of mussel shells and scattered Pismo clamshells. (Glassow et al. 2007:194–195.)

Intermediate Cultures/Maritime Lifeway (6450–3950 cal B.P.)

A second type of archaeological culture or complex is known from Middle Holocene Los Angeles County. Known as the Intermediate Cultures (6450–3950 cal B.P.), their emergence in the Northern Bight coincided with population increase, as archaeologists

infer from the increased number of radiocarbon dates during this interval. By 5950 cal B.P., radiocarbon frequencies were at least as high as those of 7950 cal B.P. Population might have decreased again around 4950 B.P., as the frequency of radiocarbon-dated archaeological materials is less than that of 6450–4950 B.P. This change is especially marked on the Channel Islands. (Glassow et al. 2007:196.) Sites still contain handstones and millingstones, although both types of artifact exhibit significant changes from their Millingstone Horizon counterparts: Intermediate Cultures' millingstones are thicker and heavier, and handstones come in diverse shapes. Mortars and pestles appear in the archaeological record dating to about 5950 B.P., although at the Sweetwater Mesa Site (CA-LAN-267), mortars and pestles might date as early as pre-6450 cal B.P. Mortars from this period exhibit small, shallow depressions, unlike the large, deep depressions that are characteristic of later mortars. (Glassow et al. 2007:196–197.) Although archaeologists are uncertain about the precise function of early mortars and pestles—whether primarily for processing acorns and large seeds, or tubers and roots—it seems that the appearance of these new tools alongside handstones and millingstones mark the incorporation of new foods into the prehistoric diet. Many Intermediate sites, however, lack mortars and pestles, and resemble Millingstone Horizon sites. (Glassow et al. 2007:197.)

Around 5950 cal B.P., the number of projectile points in Northern Bight archaeological sites increases, and the form of the artifacts shifts from leaf-shaped to side-notched. Presumably, hunting, especially of large game (such as deer), became more important among Intermediate Cultures as compared to the Millingstone Horizon. Alternatively, the Intermediate Cultures might have discarded their projectile points at locations more accessible to archaeologists. (Glassow et al. 2007:197.) The Intermediate Cultures are scantly represented on the mainland south of the Santa Barbara Channel (Glassow et al. 2007:199).

Middle/Late Holocene Transition (3950–1949 cal B.P.)

From 3950 to 2950 cal B.P., an increasingly maritime economic focus emerged in the Northern Bight, with occupations on the coast becoming more numerous. Fishing and regional exchange intensified, perhaps girding subsequent socioeconomic and political complexity in the region. Artifacts from residential and burial contexts suggest a transition from a more-or-less equal distribution of wealth and power to stratified wealth and status. Approximately 2450 cal B.P., fishing technology shifted to the use of circular shell fishhooks. (Glassow et al. 2007:200.)

As of about 2007, archaeologists have identified 54 archaeological sites that yielded radiocarbon dates between 3950 and 1949 cal B.P. in the Northern Bight. The majority of these sites are located on the Channel Islands (23 from Santa Cruz Island alone) rather than the mainland coast. The prehistoric diet during the Middle/Late Holocene transition broadened to include various marine and terrestrial habitats and species. The subsistence base consisted of acorns, islay or holly-leafed cherry[12] (*Prunus ilicifolia*), tubers, corms, and bulbs, as well as fish and sea mammals. Some archaeologists associate the incorporation of smaller animals and new plants into the transitional diet

[12] Lightfoot and Parrish (2009:266–267).

with the production of more refined mortars and pestles during this time period. (Glassow et al. 2007:200.)

A number of technological changes occurred during the Middle/Late Holocene Transition:

- Introduction of contracting-stem projectile points
- Introduction of notched stone sinkers/net weights
- Introduction of shell fishhooks about 2450 cal B.P.

Archaeologists hypothesize that the shift from side-notched to corner-notched projectile points reflects changes in hunting and/or warfare strategies. Some of the earliest examples of asphaltum basketry impressions and tarring pebbles occur alongside changes in projectile and fishing technology. (Glassow et al. 2007:200.)

Settlement of the coast increased between 3950 and 2950 cal B.P. in the Northern Bight, accompanied by cultural elaboration and less emphasis on residential mobility. Over the course of the Middle/Late Holocene Transition, decreased residential mobility or sedentism is indicated by the following archaeological traits.

- Larger sites
- Higher density of artifacts and ecofacts
- Plant remains from all seasons present
- Large clusters of semisubterranean structures
- Presence of ceremonial structures
- Presence of cemeteries. (Glassow et al. 2007:202.)

Archaeologists see in these characteristics implications for prehistoric social organization and ideology. Overall, the presence of larger, more complex archaeological sites, ceremonial structures, and formal cemeteries suggests that status differentiation and ritualized behavior had developed on the Northern Bight. For example, burials in formal cemeteries often possess various and abundant beads, ornaments, and ritual items. Additionally, artifacts similar to historically documented ritual paraphernalia have been found at transitional sites on the mainland and Santa Cruz Island. Examples include eagle or bear claws, charmstones, pipes, bone tubes, whistles, and quartz crystals. (Glassow et al. 2007:202.)

Unnamed Period (1949–950 cal B.P.)

The interval following the Middle/Late Holocene Transition exhibits increasing complexity, with midden sites becoming commonplace on the coast and well developed cemeteries. Glassow et al. (2007:203) does not mention any Los Angeles County examples, however. Notably, the plank canoe (*te'aat* or *ti'at*) was in use beginning sometime after 1450 cal B.P., largely replacing the tule balsa and dugout canoe; some researchers estimate its introduction at 1150–950 B.P. (Glassow et al. 2007:203–204; McCawley 2002:46). The plank canoe, a seaworthy craft, enabled the occupants of the Northern Bight to acquire larger quantities of large, deep-sea fish (e.g., tuna and

swordfish), and abetted frequent trade between the Channel Islands and mainland settlements (Glassow et al. 2007:204).

The bow and arrow appears in the archaeological record of the Northern Bight about 1450 cal B.P. Smaller than the dart points of the previous archaeological complexes, the earliest stone arrow tips were convex-based, leaf-shaped artifacts that were attached to the arrow shaft with asphaltum. The production of shell beads proliferated during this interval, and elaborate bone and stone ornaments and ritual items were also made. Utilitarian tools seem no more elaborate than in previous periods. (Glassow et al. 2007:204.)

Unnamed/Protohistoric Period (950 cal B.P.–Missionization)

Microblades, microblade drills, beads, and bead debitage indicate that islanders made all beads after 750 B.P. for the regional exchange system that extended to "Chumash territory and beyond" (Glassow et al. 2007:207). Prior to 750 B.P. (ca. 1200–1000 cal B.P.), there is evidence for small-scale export of bead manufactures. The manufacture of shell beads and microblades was specialized by the Middle/Late Holocene Transition, about 800–750 cal B.P. By 750 cal B.P., the costly callus[13] olive snail (*Callianax biplicata*, formerly *Olivella biplicata*[14]) shell beads were being made and served as currency during the arrival of Europeans in California. Microblades shifted from a trapezoidal shape to a triangular one, and production was centralized on Santa Cruz Island. (Glassow et al. 2007:207.)

The dietary importance of fish increased after 1000 cal B.P. and remained important thereafter. Evidence of bead-making at this time has been found on eastern Santa Rosa Island. After 1300 cal B.P., the production of mortars and pestles increased exponentially at 16 sites on San Miguel Island. (Glassow et al. 2007:207.)

Recent archaeological research suggests that the Northern Bight supported hierarchically organized habitation sites centered on estuaries. Settlement sizes were highly variable across the Los Angeles Basin, reflecting differential resource availability. Researchers propose that some estuaries supported large habitation sites, others a "rancheria pattern" of small, dispersed associated habitations. (Glassow et al. 2007:210; Grenda and Altschul 2002a:128–129.) Grenda and Altschul (2002b:166) hold that groups at small estuaries were more mobile, part of the group dispersing in times of resource stress. Subsistence remains from Playa Vista/Ballona Creek support the idea that late prehistoric economies focused mainly on local estuarine, coastal, and near-coastal resources, incorporating a broad mix of terrestrial and marine resources. As stream-deposited sediments filled estuaries and coastal wetlands, late prehistoric populations shifted from harvesting lagoon shellfish to sandy shore shellfish. Fishing focused on near-shore species. (Glassow et al. 2007:210.) Grasslands and vernal pools formed on the El Segundo Sandhills during this time (Altschul et al. 2005:295).

Ethnographic Setting

[13] The callus is the outer part of the olive snail's shell, which consists of hard enamel (King 1978:59, Figure 4).

[14] Lightfoot and Parrish (2009:234).

Gabrielino Tongva

The Gabrielino people and representative tribes are most directly related to the project vicinity. There are at least four subgroups of the Gabrielino: those of the Los Angeles Basin, those of the northern mountainous area including the inland San Fernando Valley, those of Santa Catalina and San Clemente islands, and those of San Nicolas Island. Some anthropologists question earlier linguists' assertions that the Gabrielino were a Cupan (a language of the Uto-Aztecan stock[15] of the Takic language family) speaking group. A close reading of Alfred Kroeber's Gabrielino summary suggests that the Gabrielino of Santa Catalina and San Clemente islands may have set the trends of the larger culture that thrived on the mainland (Kroeber 1976:620–623). Kroeber has suggested six linguistic subgroups based upon language dialect differences (Bean and Smith 1978:538; Kroeber 1976:620). The Gabrielino language has recently been identified as a stand-alone Takic language distinct from Cupan (Mithun 1999:539, 543–544; Sutton 2010:Table 2).

The name 'Gabrielino' is derived from the Spanish missionaries who established Catholic missions in the Los Angeles Basin in the late 1700s. Two missions were established in the soon-to-be-renamed tribe's territory: San Gabriel Arcangel and San Fernando Rey de España, respectively named after Archangel Gabriel and Saint Ferdinand, King of Spain. Hence those indigenous Californians closest to Mission San Gabriel became known of as "Gabrielinos" and those closest to San Fernando Rey de España became known of as "Fernandenos". Prior to the Spanish period it has been suggested that the Los Angeles Basin Gabrielino referred to themselves as *Kumi vit* and the San Fernando Valley natives as *Pasekarum*. The San Fernando Valley used the same names to refer to the same groups of people (Bean and Smith 1978:548). However, a word that is combined with the suffix '*vit*' refers to a specific place or village and therefore would not be suitable in reference to a group of people occupying at least 50, if not 100 villages (Johnston 1962:10).

The word '*Tobikhar*' seems to have been used in self-description by those Gabrielinos in the 1800s that moved to the mission and the name translates as "settlers" and appears to reference the fact that some Gabrielinos left their traditional villages, whether willfully or under duress, and settled near the missions (Hodge 1971:480). The words *Kizh* or *Kij* also appear in the literature but likely refer to people of a specific house and therefore would not be a name suitable for referencing a nation of people; the word *Kizh* was mistakenly used by a German linguist to refer to the Gabrielino language. However, one Gabrielino group existent today, takes the word 'Kizh' to mean "houses" and refers to all people living in the Gabrielino style willow constructed house. The word '*Tongva*' was provided to the anthropologist C. Hart Merriam in 1902 by one Gabrielino speaker (Heizer 1968:105). Loosely translated as "people of the earth"[16], 'Tongva' has gained popularity since the 1990s and is often used in conjunction with the word 'Gabrielino' (McCawley 1996:10), although at least one Gabrielino group rejects the word Tongva' as a group identifier.

[15] Uto-Aztecan is now considered a language family, with Takic as a linguistic branch within the Uto-Aztecan language family (Mithun 1999:539–540; Sutton 2010:4).

[16] McCawley (1996:9–10) suggests that the world Tongva originally named either the Gabrielinos living near Tejon or a separate Gabrielino village called *Tonjwe*.

It is not known what the island groups called themselves or what they called their linguistic relatives on the mainland. A narrative provided by Emma Hardacre suggests that the Indians of the islands and particularly San Nicolas Island were killed or intermarried by "Kodiaks" brought by American fur traders to harvest the island's otter population. The remaining Island Gabrielinos were removed in 1835 with the exception of one woman who returned to the island in search of a lost infant. The woman did not find the lost infant but continued to live in isolation on the island. She was later discovered in 1853 and was removed to the mainland where the remaining Gabrielino speakers could not understand her dialect. (Hardacre 1971:272–284) Kroeber corroborates the "Lone Woman of San Nicolas" story (Kroeber 1976:633–635). Recently, archaeologists have re-discovered the cave that the lone woman occupied during her 18 years of isolation (Schwartz and Vellanoweth 2013:391).

Some earlier references to the island dwellers and their immediate mainland coastal neighbors or relatives refer to the entire maritime-adapted culture as the "Canaliño Culture" (Johnston 1962:96; Moriarty 1969:16; Romer 1959:241). However, the usage, stemming from the earliest Spanish maritime explorations, appears to include both the cluster of southern island dwellers that tend to be affiliated with Gabrielino and the cluster of northern island dwellers that tend to be affiliated with Chumash. Santa Catalina Island is named *Pimu* or *Pipimar*, and the Gabrielinos from *Pipimar* were called *Pepimaros* (translated as "people of Pipimar") (Kroeber 1976:634, McCawley 1996:10). Despite not having a common name for the dwellers of the island, the ethnographers repeatedly credit the island cultures (and particularly the Santa Catalina Island dwellers), as the originators of the culture, including the Chinigchinix religious tradition that took hold with the mainland Gabrielino, and from the Gabrielino spread to the Luiseño, Juaneño, and Diegueño/Kumeyaay cultures to the south and east (Kroeber 1976:621–622; Moriarty 1969:2).

Today, the names Gabrielino, Tongva, or Gabrielino Tongva seem to be the most preferred references of all sub-groups. The name Gabrielino Tongva will be used for the purposes of this analysis except when referring to specific tribal entities that have various self-selected names.

Traditional Territory of the Gabrielino Tongva

The Gabrielino Tongva is considered to be the group with perhaps the greatest wealth and population, and controlled of one of the richest territories in all of prehistoric, indigenous Southern California. Their territory consists of ocean islands and waters, coast line, riverine basins, and mountains that provided a diversity of resources. (Bean and Smith 1978:538.) Their territory is located at the western terminus of one of the most established and extensive trade networks of North America.

The territorial boundaries, while imprecise, are defined here in a counterclockwise direction and starting in the southwestern area of the territory at the mouth of Aliso Creek.[17] The boundary follows Aliso Creek up into the Santa Ana Mountains and

[17] C. Hart Merriam (1968) suggests that the boundary is rather to the north along the Santa Ana River.

crosses the Santa Ana Mountains near Trabuco Peak. Descending the eastern slopes of the Santa Ana Mountains the boundary runs towards the Santa Ana River and follows the river course up to where the San Andreas fault and Santa Ana River intersect. The boundary follows the fault in a northwestern direction. The territory includes most if not all of the San Gabriel Mountains. The boundary curves back toward the ocean, following generally the area defined by Soledad Canyon. The territory includes all of San Fernando Valley, the eastern slopes of Simi Hills, and then crosses the Santa Monica Mountains where the boundary line comes down to the coast at approximately the present town of Malibu. The territory includes the ocean islands of San Nicolas, San Clemente, Santa Barbara, and Santa Catalina, and the ocean waters surrounding the islands and between the islands and the mainland. (Bean and Smith 1978:Figure 1; Heizer 1968:End Papers map; Hodge 1971:480 (Vol 1); Johnston 1962:Map; Kroeber 1976:620–621, Plate 57; McCawley 1996:3, 22–25; McCawley 2002:41; Moriarty 1969:5) The territory includes the Verdugo Mountains of which the central and highest peak was named Tongva Peak in 2006 (Chambers 2001:1–2).

The project site is located in the coastal portion of the Gabrielino Tongva's mainland territory and approximately 5 miles south of where Ballona Creek empties into the Pacific Ocean. The coastline is characterized as bluff. The coastal geology in this area is such that the coastline has been subject to both uplift and erosion. The mouths of creeks and rivers have also meandered over an extensive stretch of this coastline, making predictions of ethnographic resource locations difficult. Various historians and anthropologists provide maps of Gabrielino Tongva ethnographic village and camp locations (Heizer 1968:Map; Johnston 1962:Map; Kroeber 1976:Plate 57). A "Tongva Village" map also provides similar village and camp locations[18] (The Gabrielino/Tongva Tribe n.d.a). All of the maps and accompanying texts previously mentioned locate occupation sites that cluster about the mouth of Ballona Creek several miles to the north of the proposed ESPFM, and about the Redondo Beach area, several miles to the south of the proposed ESPFM. The stretch of coastline from Ballona Creek to the mouth of the San Gabriel River is considered to have supported the mainland Gabrielino Tongva villages most strongly affiliated with the Gabrielino Tongva villages of the islands (Heizer 1968:111; Kroeber 1976:629, 630; McCawley 1996:66–68, 72, 113, 114, 157).

Gabrielino Tongva Affiliations and Relations with Other Indigenous Groups

The Gabrielino Tongva maintained solid trade relations with all groups that surrounded them: the Chumash, Tataviam, Serrano, Cahuilla, Luiseño, and Juaneño. Through these intermediaries the Gabrielino Tongva were known as far north as the southern Central Valley homelands of the Yokuts and to the east among the Yuman tribes of the Colorado River. Some of the best steatite (soapstone) found in California was traded from Santa Catalina Island as far east as present-day central Arizona. In addition, shellfish of the Gabrielino Tongva coast provided superior source material for shell disc money. Marine mammals were in abundance along the islands and mainland shores and off-shore rookeries. In long distance exchange Gabrielino Tongva received deer hides, obsidian and white clay pottery. A more local Los Angeles Basin trading network would have facilitated the exchange of the resources that result from the rich and local environment that constituted Gabrielino Tongva and neighboring territories. There is

[18] http://gabrielenoindians.org/Site/Gabrielino_Tribal_Council.html

some suggestion that local Gabrielino Tongva trading occurred, obviously between the islands and the coast and also between the coast and the inland villages. There is further suggestion that some animosity existed between coastal and inland Gabrielino Tongva villages.

The Gabrielino were the western end of one of the most extensive indigenous trade networks in the Southwest. The extensive trail system guided people and goods between the Southern California Coast and Central Arizona (Davis 1961:2). The regional indigenous trail network was of keen interest to the missionaries, who were intent on finding overland routes that allowed for transportation links to the established missions of New Mexico (Kessel 2002:253–287).

The literature suggests that the Gabrielino Tongva were the center of the Jimson weed/datura/toloache cult (also referred to as the *Chingichngish*[19] religion) and that the neighboring Luiseño, Juaneño, and Chumash fashioned their similar ceremonies following the Gabrielino Tongva lead (Bean and Smith 1978:548; Kroeber 1976:626–627; Moriarty 1969:2).

Sources of Ethnographic Data

The earliest ethnographic sources of information can be found in the records of the Spanish explorers and later missionary records. Of the various documents related to Spanish exploration and subsequent colonization, Father Boscana's manuscript on the religious beliefs of the Gabrielino Tongva and neighboring tribes has provided invaluable information. The earliest attempt at a Gabrielino Tongva comprehensive ethnography can be attributed to Hugo Reid, a Scotsman, settler, naturalized Mexican citizen, and spouse of a Gabrielino woman, Victoria Reid. Reid documented place names and locations of Gabrielino villages and relied extensively on his wife and her relatives and contacts for his information. Reid's notes and letters have been published by Robert Heizer (Heizer 1968). Englehardt contains some ethnographic information in his writings on the California missions in general (Englehardt 1908–1915) and specifically the two missions located within Gabrielino Tongva territory (Englehardt 1927a, 1927b). C. Hart Merriam conducted seminal ethnographic research with one Gabrielino woman that produced valuable ethno-linguistic information, although it is not clear where the Merriam notes for the Gabrielino interviews are stored or published. Alfred Kroeber wrote the authoritative treatment of the Gabrielino included in the *Handbook of the Indians of California* (Kroeber 1976). John P. Harrington conducted ethnographic and linguistic studies that included ethnographic inquiry into the Chingichngish cult (Harrington 1933) and he produced a Gabrielino cultural element distribution list (Harrington 1942). Bernice Johnston produced a summary Gabrielino ethnohistory (Johnston 1962). Lowell Bean and Charles Smith co-wrote the Gabrielino section for the encyclopedic Handbook of North American Indians, Volume 8: California (Bean and Smith 1978). More recently William McCawley produced a Gabrielino ethnohistory (McCawley 1996) which was followed by a publication, co-written by

[19] There are six variant spellings of the name of this religious tradition. Bean and Smith (1978:548) clarify that the linguistic source is Luiseño and there is no known Gabrielino word for the religious tradition, although it is considered to have originated with the Gabrielino and diffused to neighboring tribes.

Claudia Jurmain that is, in part, an ethnography of contemporary Gabrielino Tongva people (Jurmain and McCawley 2009).

Gabrielino Tongva Economy, Resources and Material Culture

As stated earlier, the Gabrielino Tongva territory consists of diverse landforms and resources. The territory includes ocean islands, the ocean, coastline beaches, estuaries, salt marshes, rivers, riverine basins or piedmonts, foothills and mountains. Gabrielino Tongva were proficient at gathering acorns, sage, yucca, cacti, and a variety of plants and animals, and birds associated with the coastal salt marshes and estuaries. Sea fish such as tuna and dolphins were taken from the ocean and deer were harvested from the piedmont and mountains. Salt was gathered for daily consumption and for trade inland. The coastline extending between Ballona Creek and the Palos Verdes headlands is sheltered and featured primary villages affiliated with secondary subsistence sites located inland (Bean and Smith 1978:539). The closest known coastal village sites in proximity to the project area are located approximately 8 miles to the south, near present day city of Redondo Beach and seven miles north near present-day Playa del Rey (McCawley 1996:61–63).

Steatite was traded inland in raw and finished form, and was used to manufacture animal effigies, pipes, cooking utensils, arrow straighteners, and palettes (a type of armor plate). Asphaltum was used to line watertight vessels, including baskets and canoes, and was used to attach rare minerals, shells, and beds to ceremonial dress. Bedrock and portable mortars were in abundant use. The Gabrielino were uniquely known for specific ownership and transportation of personal mortars. Other common utensils were metates, mullers (pestles), mealing brushes, wooden stirrers, shell spoons, and wooden bowls. Deer scapulae (shoulder blades) were fashioned into saws. Bone, shell, wood and flints were fashioned into needles, awls, fishhooks, scrapers, flakers, wedges, projectile points, cane knives, and flint drills. Shell disc bead money was manufactured and used as local currency and was recognized as legitimate currency as far east as the Colorado River. Business transactions and obligations and payments on debt were tracked by knotting cordage. Ceremonial rattles were fashioned from gourds. Pottery does not show up in the various archaeological excavations of the area until the late mission period. Baskets were woven from rushes, grass, and various bushes. Various basket types included mortar hoppers, flat baskets, carrying and serving baskets, storage baskets and ceremonial baskets for grave offerings. Weapons for war or hunting consisted of war clubs, self- and sinew-backed bows, tipped and untipped cane arrows, throwing clubs, and slings. Plank canoes, fashioned from wooden planks that were tied together with cordage and caulked with asphaltum are a technological feat shared with the Chumash to the north and the Luiseño to the south. Marsh and estuary bodies of water were traveled by use of rush rafts. (Bean and Smith 1978:542; Heizer 1968:43–45; Kroeber 1978:628–632; McCawley 1996:111–142.)

Men and children went without clothing in the temperate climate. Women wore aprons of deerskin or the inner bark of willow or cottonwood trees. Capes used during cold or rainy seasons were made of deerskin, rabbit fur or bird skins woven together with milkweed or yucca fiber. Otter skins were also used and also traded inland. Ritual costumes were constructed of bird plumage, shells, and beads. Body paint was used

during ceremonial events. (Bean and Smith 1978:541–542; Heizer 1968:23–24; McCawley 1996:11–13.)

Houses were domed, circular and covered with tule, fern or carrizo reed mats. A large house could hold up to three or four families (50 people), and was perhaps 60 feet in diameter; homes were as small as 12 feet in diameter. Willow post (and along the coast and on the islands sometimes whale rib bones) were inserted a pace apart around the circumference of the house. A smoke hole was left at the top of the dome and was covered with a tule mat. Houses along the coast had doors that opened toward the sea. The house entryway was also covered with mats. A trench was dug inside the door to catch any run-off that might make its way through the matted doorway. The floor was dirt, sprinkled with water and compacted. A hearth was fashioned with cobbles in the center of the house. The interior of the house was covered with more mats and rugs fashioned out of animal skin and fur made the house a very comfortable dwelling place. Houses in the interior and at higher elevations were semi-subterranean (2 feet deep) in order to conserve heat. Adjacent to houses were wind screens fashioned from posts buried in the ground and from which matting was suspended. These wind screens provided for open air kitchens that were used during fair weather. During inclement weather, cooking occurred around the indoor hearth. Large granary baskets also were placed adjacent to the main dwelling. The granary baskets, sometimes coated with asphaltum, sat upon posted platforms. Common sweathouses were small semi-circular, semi-subterranean earth covered buildings reserved for adult male use. Sweathouses were sometimes built into banks of washes. The sweathouses were heated by direct fires and were placed near the door as the sweathouse was not fashioned with a smoke hole. The sweathouse was positioned in an area that provided nearby access to a water hole for bathing. A larger ceremonial sweathouse probably was also built similarly to the common sweathouse, but somewhat larger inside (12 feet diameter), and featured a smoke hole at the top that also functioned as an entrance to the structure via a ladder. Menstrual huts were also constructed and frequented by women. It is not clear whether the menstrual hut was also used for birthing (Heizer 1968:29). Ceremonial open-aired enclosures placed near chiefs' houses and the center of villages, were made of willow posts and willow wicker. The interiors were decorated with feathers and painted posts. The ceremonial enclosures were used for the Chingichngish (toloache) cult: an effigy of the god Chingichngish, and ceremonial sand paintings featuring depictions of the sun and moon and utilized for divination events were placed within the enclosure. Only the most revered of the village male leadership, male initiates, and female singers were permitted to enter. During funeral ceremonies the grieving family members were allowed to enter the sacred enclosure. Some villages featured a second ceremonial enclosure that was not consecrated and that was used for practicing the initiation of the younger generation into the religion. Villages also featured leveled fields surrounded by posted fences for sporting events. Larger villages were thought to have populations of as many as 1500 people. Cemeteries were located outside of but immediately adjacent to villages. Gravesites were marked by baskets or sandstone slabs decorated with etched figures commemorating the deceased. (Bean and Smith 1978:542; Kroeber 1976:628; McCawley 1996:27–30.)

Gabrielino Tongva Political Organizations and Religious Practices

Because of the missionary conversion process, coupled with a high rate of disease to which Gabrielino Tongva people were not immune, loss of traditional knowledge and a high rate of deaths left the Gabrielino Tongva cultural traditions very fragmented by the time that anthropologists arrived to document what remained of the traditional culture. Therefore, less is known about traditional Gabrielino political organization and religious practice than is the case with many other California Indians.

The Gabrielino seemed to have adhered to a moiety kinship structure likely of the "Dakota" system with Iroquois cousin terminology, similar to their neighboring Juaneño and Luiseño neighbors. Crosscutting the kinship system were three social classes. Social classes tend to appear in societies that have evolved in environments that provide an abundance and diversity of resources. Gabrielino Tongva society had an elite class of hereditary chiefs and the very wealthy. There was a middle or common class that were modestly wealthy and that were from fairly reputable lineages. There was a lower class consisting of everyone else: the poor, disreputable, or those of ill fate. Marriage or wealth accumulations were the prime avenues for social movement within the class system. There were also social organizations and guilds that cross cut village social structure and could include members from neighboring tribes. (Bean and Smith 1978:543, 545; McCawley 1996:10.)

Villages were comprised of non-localized segmentary lineages. One or two lineages might have dominated a particular village for a period of time but dominance was not permanent or guaranteed. Regardless of moiety or class affiliation, political autonomy occurred most effectively at the village or "tribelet" level, with the dominant lineage's leader assuming the village chief position. The leadership was manifest in the possession of the village sacred bundle and the possession of a chiefly name. Leadership tended to be passed through male descent, unless the other village lineage leads could agree that the either there was no one available and eligible in the controlling lineage, or there was no one of the dominant lineage that was competent to lead. Leadership at times could be passed to daughters. Village chiefs could combine and preside over more than one village and this could be done by alliance agreement or by having multiple wives, each in a different village. Larger villages could segment with some of the lineage forming a hamlet that still held allegiance to the parent village. A large and wealthy village could have multiple radiating hamlets or camps. Over time these smaller villages could rise to dominance and overshadow the parent village. A leader's responsibility was to protect the sacred bundle, collect taxes from the village houses, settle disputes, make decisions of war, negotiate peace treaties, and to generally live an exemplary life. The village leader could be assisted by an announcer, a tax collector/treasurer, general assistants and messenger/runners. However villages also had shamans who from time to time could trump the authority base of the village leader. (Bean and Smith 1978:544; McCawley 1996:89.)

Shamans gained their power and knowledge directly from the supernatural when conversing with spirits during Jimson weed-induced, altered mental states. Shamans could cure or cause calamity and illness, divine, and knew, collected and dispensed various herbal and animal remedies, including the making of poisons for weapons. Gabrielino Tongva practiced cremation of their deceased, including the burning of the

deceased's personal belongings. Shamans were responsible for conducting the yearly mourning ceremonies for grieving families of the deceased. While village leaders or chiefs protected the sacred bundle, shamans were responsible for the spiritual protection of the sacred bundle. The shamans from Santa Catalina Island were considered to have been the most powerful and were accorded due respect and it was also thought that the Chingichngish religion was brought to the mainland by the religious leaders of the island (Johnston 1962:97). (Bean and Smith 1978:544.)

Gabrielino Tongva religious beliefs and practices are not well understood or documented but it appears that the Gabrielino Tongva, and perhaps the Gabrielino Tongva of Santa Catalina Island specifically, developed the toloache cult which involved ritual consumption of Jimson weed. This cult spread to tribal nations throughout Southern California and the southern Central Valley. The Jimson weed cult was most closely associated with the creator deity Chingichnich, who is attributed with fixing the world for humans. There is a pantheon of deities that surround Chingichnich. Participants, perhaps inducted into the cult during adolescence, gained insight into the nature of the world and the tribal and individual role and place in the universe; and that insight provided success in hunting, warring, or other activities of importance to the survival of the village over time. The Gabrielino Tongva religion provided the society with a strict moral, political, economic, and legal code. (Kroeber 1976:626; McCawley 1996:143–169; Moriarty 1969.)

Gabrielino Tongva Burial Knowledge and Practice

Burial beliefs and practices stem from the instructions of Chingichnich before he departed this world. There was a concept of an afterlife, place of heaven, and something similar to the Catholic concept of purgatory. Upon death of the person, characterized as the breath leaving the body, it was understood that the heart of the person did not die, but through proper ritual was transported to heaven or purgatory. Heaven was thought to exist to the west, beyond San Clemente Island. In this "distant mountain in the sea" a benevolent god presided and all was good. For those who had imperfectly practiced Chingichnich's instruction, purgatory was a place to the east "in the hills" where one's heart would reside indefinitely until the god determined that proper penance had been performed. For the leaders of villages, the path to heaven was automatically assured so long as ritual consumption of a small portion of the deceased was conducted. After death, a wake would occur for a few days while general mourning commenced. The body was wrapped in a blanket, mat, net, or seaweed. After the wake, the body of the deceased was carried in procession to the village burial area where the burial commenced. Mainland Gabrielino Tongva tended to conduct cremations while the island Gabrielino Tongva adhered to flexed burial practice. The hands were placed across the breast, and the entire body bound. That portion of the coastal mainland, from Ballona Creek to San Gabriel River, where island Gabrielino Tongva had the strongest relations, tended to also practice flexed burial internment. For those villages adhering to cremation of the deceased, the cremains were either interred or disposed of to the east of the village. Grave offerings were buried with deceased or, in the case of cremation, burned with the corpse. Some burials feature dog burials placed above the corpse. Gabrielino Tongva saw the worlds of the living and the dead to be parallel places; therefore the items buried or burned with the deceased were intended to accompany the person to the afterworld where their statuses were recognized by the items that

accompanied them. To loot a grave today is perceived by traditionally minded Gabrielino Tongva to be a robbery of the deads' status in another world. After the funeral ceremony, the living mourned for a year. Every fall, after the harvest ceremonies, an annual mourning ceremony was conducted for all of those who had passed in the past year. (Bean and Smith 1978:545–546; Heizer 1968:30–31; McCawley 1996:155–158.)

Contemporary Tribal Entities with Ethnographic Affiliations

There are various Gabrielino Tongva tribes, nations, and other organizations. Names are very similar and it is difficult at first glance to differentiate among the groups. The Native American Heritage Commission list provides additional tribal names that represent Gabrielino Tongva people and culture. Tribal entities are listed below.

Gabrielino Band of Mission Indians – Kizh (Kitc) Nation

The Tribe does not affiliate with the name "Tongva" and instead prefers the name 'Kizh' (Kitz). They suggest that 'Kizh' refers to houses made of willow, tule, and brush and refers to all the people that lived in such houses, ostensibly all "Gabrielinos". The tribal council of seven seeks federal recognition and is an advocate for the protection of cultural resources.

Gabrielino-Tongva Tribe

The Gabrielino–Tongva Tribe, historically part of the San Gabriel Band of Mission Indians, has offices in Los Angeles. The tribe seeks federal recognition status, but has yet to receive recognition. They are guided by a council of four that collectively show expertise in business. The Tribe has been involved in efforts to establish a casino resort in the Los Angeles area, and is assisted in this endeavor by outside legal counsel. (Gabrielino-Tongva Tribe 2014a, 2014b.) The Tribe has requested that project ground-disturbing activities are monitored by tribal people.

Gabrielino/Tongva Indians of the California Tribal Council

Also referred to as the Gabrielino/Tongva Tribe of the Los Angeles Basin, their website covers the process and documentation of the tribe's elections (The Gabrielino/Tongva Tribe n.d.b).

Ti'at Society/Intertribal Council of Pimu

The Ti'at Society is an informal educational group that was organized in 1989 and comprises members of the Tongva people as a whole. The society's members are educators, artists, dancers, native plant experts, scholars, and authors who use creative visual arts and educational programs to celebrate primarily the maritime culture of the Tongva and to educate Tongva and non-Tongva concerning their heritage. (Jurmain and McCawley 2009:127.)

No information was available pertaining to other known tribal entities, including the Gabrielino/Tongva San Gabriel Mission, Tongva Ancestral Territorial Tribal Nation, Gabrieleno/Tongva San Gabriel Band of Mission Indians, and Gabrielino Tongva Nation.

Historic Setting

Spanish Period (1769–1821)

By the middle of the sixteenth century, Spain had emerged as the premier naval and military power in Western Europe, with colonies in North and South America and a trading network throughout the Pacific. On September 28, 1542 Juan Rodriguez Cabrillo arrived in San Diego aboard the San Salvador and claimed the land in the name of Spain (San Diego History Center 2012). In November 1602, Sebastian Vizcaino arrived in San Diego, surveying the coastline and getting as far north as Oregon (San Diego History Center 2012). In the late 1770s, Antonio Maria de Bucareli, the Viceroy of New Spain, "legitimized Spain's claim to Alta California by making it the new *Provincia de California* [Province of California] with a provisional capitol at the Presidio at Monterey" (Steiner 1999:6). Bucareli's plan was to use the missions to colonize the new province. While the Spanish explored the coast of present-day California in the mid-sixteenth century, it was not until the incursion of Russian and British explorers into what are now Alaska, British Colombia, Washington, and Oregon in the 1750s that the Spanish made serious attempts to colonize Alta California (Steiner 1999:4–6). It was Bucareli who ordered Juan Bautista de Anza to lead an exploration to establish an overland route from Sonora (present day Arizona) as well as from Mexico in order to facilitate the colonization of California and provide a stable supply route. Over 150 years would pass before the Spanish would attempt permanent settlement.

The Spanish colonization of California was achieved through a program of military-civilian-religious conquests. Soldiers secured areas for settlement by suppressing Indian and foreign resistance and establishing fortified structures called presidios. Civilians established pueblos (e.g., towns) and Spanish priests led the religious conquest by establishing missions and converting the Indians. The Spanish ultimately built 21 missions in California. Local Native American tribes were the dominant source of labor at the missions.

In 1822, Mexico achieved independence from Spain, and California became an outpost of the Mexican Republic.

Mexican Period (1821–1846)

By the 1840s, there was a steady migration of American settlers into California. Unable to stop the incursion, the Mexican government granted citizenship to all who would pledge to follow Mexican law. Many of these foreigners received land grants on which they established grazing and commercial operations. One example of this is the New Helvetia Rancho granted to John Sutter in 1839 in what is now the city of Sacramento.

War broke out between the United States and Mexico in May 1846, with some decisive battles occurring in California. The American victory over Mexico was formalized in February 1848 with the signing of the Treaty of Guadalupe Hidalgo, and Mexico ceded all its land holdings above the Gila and Rio Grande rivers to the United States. California was admitted as the thirty-first state in the Union on September 9, 1850.

American Period

In 1848, the discovery of gold at Sutter's Mill in northern California, east of Sacramento, kick started the California Gold Rush. In 1850, California was granted statehood and its first 27 counties were established.

City of El Segundo

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 2001:4).

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 2001:4). The rancho remained in Abila's family for 10 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 2001:5). 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 2001:6).

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 in a commercial core for the city. The three major streets within this core were Richmond Street, Main Street, and Grand (ESPR 2001:7–8). In current times, the Richmond Street District is recognized by the city of El Segundo as having 22

structures of historical significance and the Specific Plan for the downtown area includes development incentives for preservation of the historic structures[20].

The 1930s brought the beginnings of the Los Angeles Airport (originally Mines Field) and the aerospace industry to El Segundo—including Douglas Aircraft (1928), Northrop (1932) and North American Aviation (1935). Hughes Aircraft arrived in the 1950s, supplementing the post-World War II military presence in the area (ESPR 2001:10).

Steam Generation Plants in the United States

In 1879, the Brush Plant in San Francisco was the first central generating station on the west coast to produce and distribute electricity on demand to customers. Prior to Thomas Edison's invention of the incandescent electric light bulb in 1879, only the electric arc system was available, which turned out to be unsafe for indoor use. Edison is also known for improving the generation and distribution systems for electricity, which truly opened up the consumer market. This "central station" concept was to become the cornerstone of the electric utility industry. (Myers 1983:11.)

Hydroelectric power was the dominant form of electric generation in California in 1920. By 1940, it grew to 89 percent of the market in California. However, by 1960, steam generating plants became the primary source of electricity in California as hydroelectric generation had fallen to 27 percent. (JRP 2013:4–5.)

Southern California Edison Company

The Southern California Edison Company (SCE) acknowledges three early predecessors; Holt and Knupp, the Santa Barbara Electric Light Company, and one individual entrepreneur. Holt and Knupp, later known as the Visalia Electric Light and Gas Company, were responsible for lighting the streets of Visalia in 1886 as part of their Visalia Iron and Agricultural Works. (Myers 1983:13–14.) The Santa Barbara Electric Light Company was founded by General Samuel W. Backus 1886 and on March 15, 1887 the company began providing power to homes, businesses, and hotels that had subscribed to the service as well as street lighting downtown (Myers 1983:17). The third predecessor of the SCE began when Charles R. Lloyd leased the power privileges at the Riverside Water Company's irrigation canal; near Highgrove the canal dropped 50 feet at one point and Lloyd planned to use this fall to generate electricity (Myers 1983:19). Eventually Lloyd would incorporate his venture as the San Bernardino Electric Company (Myers 1983:20). Shortly after the steam powered systems in Visalia and Santa Barbara and the hydro powered system in Highgrove went online several other electric utilities began service and by the 1890s electric service was fairly wide-spread (Myers 1983:21–22). Initially power plants used direct current dynamos, which were limiting because the electricity could only travel about 3 miles, restricting the area that could be served. The introduction of alternative current dynamos extended this distance considerably and Almanrian William Decker's (San Antonio Light and Power engineer in the early 1890s) invention of the oil-filled transformer that allowed the step-up, step-down transformation of current allowed distribution over long distances (Myers 1983:22, 24, 26). In a matter of months in 1892 and 1893, electric technology and the electric utility industry were revolutionized by two hydroelectric power plants in Southern

[20] Downtown Specific Plan, Exhibit 7 (**El Segundo 2000**)

California; the San Antonio plant proved the commercial feasibility of long-distance distribution, and the Mill Creek plant is where the three-phase alternating current technology first appeared (Myers 1983:31). The Mill Creek plant continues to operate today. In 1894 the Los Angeles Edison Electric Company was formed to obtain a license from General Electric, Thomas Edison's company, to use the Edison name and patents in the Los Angeles area. In 1897, it merged with the West Side Lighting Company under the name the Edison Electric Company of Los Angeles (Myers 1983:37). As technology and the customer based allowed the company grew. In 1901, John Barnes Miller became president; he was responsible for negotiating a number of mergers with the goal of creating a regional system (Myers 1983:40).

After World War II, steam-generated electricity underwent a significant expansion. Beginning in 1948, with the construction of Redondo Beach Steam Station, and over the ensuing several decades, ten new multiple-unit oil and gas-fired power plants came on line at coastal and inland sites in Southern California. Seven of these were Edison projects and three were Calelectric (California Electric Power Company) projects. (Myers 1983:208–209.) Calelectric's system was merged into Edison's on January 1, 1964 (Myers 1983:205).

Post-War Electric Power Generation in the United States and California

"The pent-up demand for electricity and electrical appliances after World War II sent utility companies scurrying for capacity. Usage jumped 14% between 1946 and 1947, but power firms could not get enough equipment to meet demand as labor troubles at manufacturers and reconversion to a peace-time economy stalled deliveries. But as the immediate post-war constraints alleviated themselves, the growth rate slowed to about 8% per year nationally from between 1947 and 1973. At this rate, utilities doubled the amount of electricity sold every nine-to-ten years." (Hirsh 2002.)

As noted in the previous subsection ("Southern California Edison Company"), SCE expanded and built many plants in the post-war years to accommodate the demand for electricity. The following plants were built in rapid-fire succession in Southern California: Etiwanda (1951), Redondo Beach Plant No. 2 (1952), El Segundo (1955), and Alamitos (1955). New units were added to all of these plants in the ensuing years into the mid-sixties. (JRP 2013:9.)

These new units constructed in the fifties and sixties were very similar to each other in design (JRP 2013:9). They evidenced that a transition had been made from indoor steam generating plants, with the components housed in architectural shells, to largely outdoor facilities generally lacking architectural merit or pretense. This is particularly evident at ESEC, Etiwanda, Alamitos and Huntington Beach. This transition is manifested at Redondo Beach Generating Station, where the original 1948 Plant 1, housed in an architectural shell in a defined style (Art Moderne) based on pre-WW2 standards, transitions to the later Plants 2 (1956) and 3 (1968) with less architectural embellishment and more open construction.

El Segundo Energy Center

The original facilities at ESEC were comprised of two units, Units 1 and 2, built from 1953 to 1956. Units 3 and 4 were added in 1963 and 1964. All units were converted to natural gas in the 1970s. SCE sold the units to NRG in 1998, about the same time that

SCE sold most of its other gas-fired steam plants. Units 1 and 2 were removed and replaced with Units 5–7, with construction having concluded this year (AES 2013a; ESP 2000:1-2; JRP 2013:10–12.)

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

METHODS AND THRESHOLDS FOR DETERMINING SIGNIFICANCE

Regulatory Context

California Environmental Quality Act

Various laws apply to the evaluation and treatment of cultural resources. CEQA requires the Energy Commission to evaluate resources by determining whether they meet several sets of specified criteria. These evaluations then influence the analysis of potential impacts to the resources and the mitigation that may be required to ameliorate any such impacts.

CEQA and the State CEQA Guidelines define significant cultural resources under two regulatory definitions: historical resources and unique archaeological resources. A historical resource is defined as a "resource listed in, or determined to be eligible by the State Historical Resources Commission, for listing in the CRHR", or "a resource listed in a local register of historical resources or identified as significant in a historical resource survey meeting the requirements of Section 5024.1(g) of the Public Resources Code," 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, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California, provided the agency's determination is supported by substantial evidence in light of the whole record." (Cal. Code Regs., tit. 14, § 15064.5[a].) Historical resources that are automatically listed in the CRHR include California historical resources listed in or formally determined eligible for the National Register of Historic Places (NRHP) and California Registered Historical Landmarks from No. 770 onward (Pub. Resources Code, § 5024.1[d]).

Under CEQA, a resource is generally considered to be historically significant if it meets the criteria for listing in the CRHR. These criteria are essentially the same as the eligibility criteria for the NRHP. In addition to being at least 50 years old,[21] a resource must meet at least one (and may meet more than one) of the following four criteria (Pub. Resources Code, § 5024.1):

- Criterion 1, is associated with events that have made a significant contribution to the broad patterns of our history;
- Criterion 2, is associated with the lives of persons significant in our past;

[21] The Office of Historic Preservation (OHP 1995:2) endorses recording and evaluating resources over 45 years of age to accommodate a five-year lag in the planning process.

- Criterion 3, embodies the distinctive characteristics of a type, period, or method of construction, or represents the work of an important creative individual, or possesses high artistic values; or
- Criterion 4, has yielded, or may be likely to yield, information important to history or prehistory.

In addition, historical resources must also possess integrity of location, design, setting, materials, workmanship, feeling, and association (Cal. Code Regs., tit. 14, § 4852[c]).

Even if a resource is not listed or determined to be eligible for listing in the CRHR, CEQA allows the lead agency to make a determination as to whether the resource is a historical resource as defined in Public Resources Code, sections 5020.1(j) or 5024.1.

In addition to historical resources, archaeological artifacts, objects, or sites can meet CEQA's definition of a unique archaeological resource, even if it does not qualify as a historical resource (Cal. Code Regs., tit. 14, § 15064.5[c][3]). Archaeological artifacts, objects, or sites are considered unique archaeological resources if "it can be clearly demonstrated that, without merely adding to the current body of knowledge, there is a high probability that it meets any of the following criteria:

1. Contains information needed to answer important scientific research questions and that there is a demonstrable public interest in that information.
2. Has a special and particular quality such as being the oldest of its type or the best available example of its type.
3. Is directly associated with a scientifically recognized important prehistoric or historic event or person." (Pub. Resources Code, § 21083.2[g].)

To determine whether a proposed project might have a significant effect on the [cultural resources] environment, staff analyzes the proposed project's potential to cause a substantial adverse change in the significance of historical or unique archaeological resources. The significance of an impact depends on:

- The cultural resource affected;
- The nature of the resource's historical significance;
- How the resource's historical significance is manifested physically and perceptually;
- Appraisals of those aspects of the resource's integrity that figure importantly in the manifestation of the resource's historical significance; and
- How much the impact will change those integrity appraisals.

At Title 14, California Code of Regulations, section 15064.5(b), the State CEQA Guidelines define a substantial adverse change as "physical demolition, destruction, relocation or alteration of the resource or its immediate surroundings such that the significance of an historical resource would be materially impaired."

National Register of Historic Places

Staff's analysis in this section of the FSA focuses on assessing whether the proposed amendment would result in impacts on historical resources or unique archaeological resources under CEQA. However, the project owner previously evaluated the ESEC for significance under the NRHP criteria, and its recent reevaluation of the resource also applied these criteria (see "Historic Built Environment Survey" below). Therefore, staff provides a discussion of the NRHP criteria immediately below.

The National Historic Preservation Act (NHPA) of 1966 authorized the creation of the NRHP, which contains the federal government's list of buildings, structures, objects, site, and districts that it considers significant in American history, architecture, engineering, archaeology, and culture (16 U.S.C. § 470[a][1][A]). Properties eligible for inclusion in the NRHP must meet one or more of the significance criteria defined below.

- Criterion A: Properties associated with events that have made a significant contribution to the broad patterns of American history.
- Criterion B: Properties associated with person significant in the American past.
- Criterion C: Properties that embody distinctive characteristics of a type, period, or method of construction, or are the work of a master, or possess high artistic values, or represents a significant and distinguishable entity whose components may lack individual distinction.
- Criterion D: Properties that yield or may yield information important in prehistory or history. (36 C.F.R. § 60.4.)

In addition to meeting one of the criteria listed above, a property must retain historical integrity. The NRHP assesses seven aspects of historical integrity:

- Location: The place where the historic property was constructed or the place where the historic event occurred.
- Design: The combination of elements that create the form, plan, space, structure, and style of a property.
- Materials: The physical elements that were combined or deposited during a particular period of time and in a particular pattern or configuration to form a historic property.
- Workmanship: The physical evidence of the crafts of a particular culture of people during any given period in history or prehistory.
- Setting: The physical environment of a historic property.
- Feeling: A property's expression of the aesthetic or historic sense of a particular period of time.
- Association: The direct link between an important historic event or person and a historic property. (36 C.F.R. § 60.4.)

It is unnecessary for a property to retain all seven aspects of integrity, but a property must retain those essential aspects that convey its significance. When the integrity of a property is being evaluated, the property should also be compared with similar properties. Such comparisons may be important for determining the physical features that are essential for conveying the historical significance of a property. (Little et al. 2000:35–36.)

Certain property types are usually excluded from consideration of listing in the NRHP but may be included if they meet special requirements in addition to the regular criteria as follows (Andrus 2002; Sherfy and Luce 1998):

- Consideration A: Religious Properties
- Consideration B: Moved Properties
- Consideration C: Birthplaces and Graves
- Consideration D: Cemeteries
- Consideration E: Reconstructed Properties
- Consideration F: Commemorative Properties
- Consideration G: Properties that have Achieved Significance within the Last Fifty Years.

Historical Resources Inventory

The development of the inventory of historical resources in and near the proposed ESPFM is the requisite first step in the assessment of whether the project might, under Public Resources Code, section 21084.1, cause a substantial adverse change in the significance of a historical resource, and might, therefore, have a significant effect on the environment. The effort to develop the inventory has involved conducting a sequence of investigatory phases that includes background research, consulting with local Native American communities, field visits, interpreting the results of the inventory effort, as a whole, and evaluating whether found cultural resources are historically significant. This section discusses the methods and the results of each inventory phase, develops the historical resources inventory for the analysis of the proposed project, and interprets the inventory to assess how well it represents the cultural resources of the PAA.

Project Area of Analysis

The PAA is a concept that staff uses to define the geographic area in which the proposed project has the potential to affect cultural resources. The effects that a project might have on cultural resources can be immediate, further removed in time, or cumulative. They can be physical, visual, auditory, or olfactory in character. The geographic area that would encompass consideration of all such effects might or might not be one uninterrupted expanse. It can include the project area, which would be the site of the proposed plant (project site), the routes of requisite transmission lines and water and natural gas pipelines, and other offsite ancillary facilities, in addition to one or several discontiguous areas where the project could be argued to potentially affect cultural resources.

Staff defines the PAA as comprising the proposed project site and the construction parking and laydown areas. The PAA for the built environment for projects in urban

areas typically includes the project and properties within a one-parcel boundary. Linears are normally evaluated by way of a reconnaissance survey along the proposed routes (Cal. Code Regs., tit. 20, § 1704[b][2], Appendix B[g][2][C]). In lieu of a one-parcel PAA survey, staff completed a reconnaissance level “windshield” survey of the one parcel buffer, conducted research to determine the age of the observed properties, and reviewed the literature search results upon receipt. Even though built environment historic resources have been identified elsewhere in the project vicinity, staff concludes that a one-parcel PAA for the project is sufficient.

Demolition and excavation are proposed within the project site to variable depths. Although the depths of excavation for some components of the proposed project are unknown, the project owner expects demolition and construction-related excavation to reach as deep as 21 feet below the current ground surface. The depths of excavation are shown in **Cultural Resource Table 2** and define the vertical limits of the PAA.

For ethnographic resources, the PAA takes into account sacred sites, traditional cultural properties (places), and larger areas such as ethnographic landscapes that may be far-ranging, including views that contribute to the historical significance of such historical resources. The NAHC assists project cultural resources consultants and staff in identifying these resources, and consultation with Native Americans and other ethnic or community groups may contribute to defining the area of analysis. For the proposed ESEC, staff identifies the ethnographic resources PAA as coterminous with the archaeological PAA.

Cultural Resources Table 2
Depth of Excavation by Project Component

Project Component	Maximum Depth of Excavation	Depth of Previous Excavation	Depth of Fill	References
Parking lot	1.5 feet	Up to 21 feet	Up to 21 feet thick	ESEC 2013b:Figure CR-1
Access road	3.5 feet	Unknown	Unknown	ESEC 2013b:Figure CR-1
Operations and maintenance building	≥ 15 feet	Unknown	Up to 21 feet	ESEC 2013b:Figure CR-1
Natural gas compression station/Fuel gas compressor building	Unknown	4–10 feet	4–10 feet	ESEC 2013a:2-7, Figure 1-2b; ESEC 2013b:Figure CR-1
Forwarding pump	3 feet	Unknown	Unknown	ESEC 2013a:2-11; ESEC 2013c:53–54
Demolish and remove Units 3 and 4	5–20 feet	8.00–14.75 feet	Unknown	ESEC 2013b:Figure CR-1; **Project Description**
Construct new units	Up to 21 feet	8.00–14.75 feet	8.00–14.75 feet	ESEC 2013b:Figure CR-1; **Project Description**
Remove and remediate ESEC retention basins	Unknown	Unknown	Unknown	ESEC 2013a:1-1
Once-through-cooling plug	All work would occur in previously disturbed contexts			**Project Description**
Note: The **Project Description** in this FSA states that the once-through-cooling plug would be designed and constructed similar to those for the Discharge 001 tunnels for Units 1 and 2 as part of the 2007 dry cooling amendment.				

Background Research

The background research for staff's analysis employs information that the project owner and staff gathered from literature and record searches, and information that staff obtained as a result of consultation with local Native American communities and local agencies. Staff relies upon information obtained through records searches, additional background research, tribal consultation, and field visits.

Literature Review and Records Search

The literature review and records search portion of the background research attempts to gather and interpret documentary evidence of the known cultural resources in the PAA.

Records Searches

Recent information about previous cultural resources studies and known cultural resources in the project vicinity—combined with an understanding of local-area prehistory, ethnography, and history[22]—is essential to analyze the potential impacts of a proposed project on cultural resources. The State of California's authoritative repository of previous cultural resource studies and known cultural resources is the California Historical Resources Information System (CHRIS). The CHRIS divides its records among several regional information centers; the South Central Coastal Information Center (SCCIC) houses the cultural resources records for Los Angeles, Orange, and Ventura counties.

The "Introduction" to this section of the FSA establishes that resources as young as 45 years old at the time of analysis receive consideration as cultural resources under CEQA and the Energy Commission's project siting review. Each passing year admits more cultural resources into the 45–50-year benchmark for potential significance (especially common with historic built environment) and possibly witnesses additional cultural resource studies. In addition, previous studies and cultural resources record forms also provide much of the local context for prehistoric, ethnographic, and historic resources—information that is often lacking in summary data sources and regional, published sources. Therefore, it is imperative that project owners provide staff with the results of a records search not older than 1 year. The Energy Commission's power plant siting regulations describe the information needed in the records search results:

> The results of a literature search to identify cultural resources within an area not less than a 1-mile radius around the project site and not less that than one-quarter (0.25) mile on each side of the linear facilities. Identify any cultural resources listed pursuant to ordinance by a city or county, or recognized by any local historical or archaeological society or museum.
>
> Literature searches to identify the above cultural resources must be completed by, or under the direction of, individuals who meet the Secretary of the Interior's Professional Standards for the technical area addressed.
>
> Copies of California Department of Parks and Recreation (DPR) 523 forms (Cal. Code Regs., tit. 14, § 4853) shall be provided for all cultural resources (ethnographic, architectural, historical, and archaeological) identified in the literature search as being 45 years or older or of exceptional importance as defined in the National Register Bulletin Guidelines (36 C.F.R. § 60.4(g)).
>
> A copy of the USGS [U.S. Geological Survey] 7.5' quadrangle map of the literature search area delineating the areas of all past surveys and noting the California Historical Resources Information System (CHRIS) identifying number shall be provided.
>
> Copies also shall be provided of all technical reports whose survey coverage is wholly or partly within 0.25 mile of the area surveyed for the project under Section (g)(2)(C), or which report on any archaeological excavations or architectural surveys within the literature search area. (Cal. Code Regs., tit. 20, § 1704, Appendix B[g][2][B].)

[22] Local-area prehistory, ethnography, and history is defined as being within no more than a 5-mile radius of the project location (Cal. Code Regs., tit. 20, § 1704[b][2], Appendix B[g][2][A]).

The project owner did not provide a records search prior to publishing of the PTA (ESEC 2013a:Section 3.3). Previous records searches conducted in support of activities at the ESEC were conducted too long ago to be relied upon for the present amendment: October 9, November 1, and November 8, 2000; and March 2007 (CEC 2002:4.3-8; Wesson et al. 2000:18; White et al. 2008:3). Staff does not possess copies of these previous records searches, nor figures depicting the complete records search results, because the project owner did not provide these materials for the present amendment.

In light of the foregoing information, staff submitted to the project owner Data Request 78 on August 12, 2013, summarized as follows:

> Staff found that previous records searches on the project site are insufficient for staff's analytical purposes, for two reasons. First, the two records searches conducted for the project site were conducted seven and 13 years ago (Wesson et al. 2000:18, Figure J-2, Attachment B; White and White 2007:5). Additional cultural resources studies might have been conducted in the project vicinity and new cultural resources identified as a consequence. Second, since 2007, Energy Commission siting regulations have required project owners to conduct records searches for a minimum of 1 mile—rather than the 0.5-mile buffer from the proposed project site and a minimum of 0.25 mile from proposed linear facilities. (20 Cal. Code Regs., Appendix B (following Art. 6), §(g)(2)(B); see also § 1704, subd. (b)(2)). Accordingly, staff requested the project owner in Data Request 78 to conduct a records search at the SCCIC and provide staff with the search results, following the requirements at Title 20, California Code of Regulations, Appendix B (CEC 2013a:25).

Between September 12, 2013 and April 22, 2014, the project owner and staff negotiated the appropriate scope of the records search through a series of data responses and public workshops (CEC 2013b; ESEC 2013b:51; ESEC 2014a:2, Table DR78-1).

Methods and Results

CH2M Hill archaeologists conducted records searches at the SCCIC on December 5, 2013; February 6, 10, and 11, 2014; and April 26 and 28, 2014. The records searches covered the project site and all proposed staging and parking areas, except for the Marina Del Rey Boat Launch Parking Area and Federal Express Staging/Parking Area, which the project owner has dropped from the proposed project amendment. In addition to the project site and proposed staging and parking areas, CH2M Hill searched a 1-mile buffer surrounding the various project components. CH2M Hill archaeologists made copies of previous cultural resources studies and recordation forms for previously recorded cultural resources according to the requirements in the Energy Commission's siting regulations, presented in the previous subsection (Cal. Code Regs., tit. 20, § 1704, Appendix B[g][2][B]). Given that the project owner has not proposed excavation in the proposed parking and staging areas, staff agreed that CH2M Hill need only copy previous studies and recordation forms in and within a 0.25-mile buffer from the staging and parking areas. (ESEC 2014b:2, 5.)

In addition to consulting the SCCIC's base maps of previous cultural resource studies and known cultural resources, CH2M Hill consulted the Historic Resources Inventory for

pertinent portions of Los Angeles County (OHP 2012:122–123, 128–133, 244, 448, 609, 630, 633–634, 847, 1020, 1022) (ESEC 2014b:Attachment DR78-1).

In addition, staff examined cultural resources documents filed with the Energy Commission for compliance proceedings associated with previous construction projects on the project site.

Staff's literature review indicates that 19 previous cultural resource studies have been conducted in the PAA and 92 previous studies have been conducted within 0.25–1.00 mile of the PAA (**Cultural Resources Tables 3** and **4**). Among the previous studies in the PAA, White et al. (2014) reports on the monitoring activities of archaeological and Native American monitors during previous construction projects on the proposed project site.

Cultural Resources Table 3
Literature Review Results: Previous Studies in the PAA

Author and Date of Study	SCCIC Study Number
Project Site	
Woodward 1987	LA-01625
Wesson et al. 2000	LA-06239
Bunse and Mikesell 2000	LA-06240
White et al. 2008	Not at SCCIC
Bonner 2011a, 2011b	LA-11638
Bonner 2012a	LA-11971
Bonner and Crawford 2012	LA-12078
White et al. 2014	Not at SCCIC
LAX Pershing Staging/Parking Area	
Wesson et al. 2000	LA-06239
Bunse and Mikesell 2000	LA-06240
Mikesell 2000	Not at SCCIC
PCR 2001	Not at SCCIC
LAWA 2005	Not at SCCIC
Los Angeles 2008	Not at SCCIC
Sapphos 2013	LA-12267
URS 2013	Not at SCCIC
Sapphos 2014	Not at SCCIC
Chevron Marine Terminal Staging Area	
Wesson et al. 2000	LA-06239
Bunse and Mikesell 2000	LA-06240
Mikesell 2000	Not at SCCIC
JRP 2001	Not at SCCIC
Hyperion Parking Area	
Wesson et al. 2000	LA-06239
Bunse and Mikesell 2000	LA-06240
Mikesell 2000	Not at SCCIC
Grand Avenue Parking Area	
Wesson et al. 2000	LA-06239
Bunse and Mikesell 2000	LA-06240
Mikesell 2000	Not at SCCIC
Power 2011	Not at SCCIC
Dockweiler State Beach Parking Area	

Author and Date of Study	SCCIC Study Number
Wesson et al. 2000	LA-06239
Bunse and Mikesell 2000	LA-06240
Mikesell 2000	Not at SCCIC
Kramer Staging Area	
Peak & Associates 1992	LA-02950
Wesson et al. 2000	LA-06239
Bunse and Mikesell 2000	LA-06240
Mikesell 2000	Not at SCCIC
SWCA 2006	LA-08255
W. 190th Street Parking/Laydown Area	
Racer 1939a	LA-11482
Bucknam 1974	LA-03583
Romani 1982	LA-05331
Dillon 1984a	LA-01445
White and White 2007	Not at SCCIC

Cultural Resources Table 4
Literature Review Results: Studies within 0.25–1.00 Mile of PAA

Author and Date of Study	SCCIC Study Number
Project Site	
D'Altroy 1975	LA-04051
Leonard 1975	LA-00125
Romani 1976	LA-03494
Peak & Associates 1992	LA-02950
Stickel 1993	LA-02904
McLean 1998a	LA-04190
Duke 1999a	LA-06242
Gray 1999	LA-04761
Duke 2000a	LA-04861
Maki 2000	LA-04907
Mikesell 2000	Not at SCCIC
JRP 2001	Not at SCCIC
Duke 2002a	LA-05758
Duke 2002b	LA-06243
McKenna 2002a	LA-05708
Maki 2005	LA-07722
Bonner 2005	LA-07716
Gust et al. 2009	Not at SCCIC
Richards 2009	LA-09925
White 2009	LA-10622
Wlodarski 2009	LA-10369
LAX Pershing Staging/Parking Area	
Leonard 1974	LA-00096
D'Altroy 1975	LA-04051
Leonard 1975	LA-00125
Leonard 1976	LA-01982
Romani 1976	LA-03494
Myra L. Frank 1987	LA-03673
Wlodarski 1987	LA-00309
Stickel 1993	LA-02904

Author and Date of Study	SCCIC Study Number
Raschke et al. 1995	LA-04910
Duke 1999b	LA-04647
Duke 2000a	LA-04861
Maki 2000	LA-04907
PCR 2001	Not at SCCIC
Duke 2002b	LA-06243
McKenna 2002a	LA-05708
PCR 2003a	Not at SCCIC
Barre 2005	LA-11561
Brian F. Smith and Associates 2005	LA-10857
LAWA 2005	Not at SCCIC
Getchel and Atwood 2006	LA-07851/LA-11560
Los Angeles 2008	Not at SCCIC
Gust et al. 2009	Not at SCCIC
Richards 2009	LA-09925
White 2009	LA-10622
LAWA 2011	Not at SCCIC
Power 2011	Not at SCCIC
Bonner 2012b	LA-12079
LAWA 2012a	Not at SCCIC
PCR 2012	Not at SCCIC
URS 2012	Not at SCCIC
Sapphos 2013	LA-12267
URS 2013	Not at SCCIC
Sapphos 2014	Not at SCCIC
Chevron Marine Terminal Staging Area	
D'Altroy 1975	LA-04051
Leonard 1975	LA-00125
Romani 1976	LA-03494
Woodward 1987	LA-01625
Peak & Associates 1992	LA-02950
Stickel 1993	LA-02904
Duke 2000a	LA-04861
Maki 2000	LA-04907
Duke 2002a	LA-05758
Duke 2002b	LA-06243
McKenna 2002a	LA-05708
Bonner 2005	LA-07716
Maki 2005	LA-07722
Gust et al. 2009	Not at SCCIC
White 2009	LA-10622
Bonner 2011a, 2011b	LA-11638
Power 2011	Not at SCCIC
Bonner 2012a	LA-11971
Bonner and Crawford 2012	LA-12078
Hyperion Parking Area	
Leonard 1974	LA-00096
D'Altroy 1975	LA-04051
Leonard 1975	LA-00125
Leonard 1976	LA-01982

Author and Date of Study	SCCIC Study Number
Romani 1976	LA-03494
Myra L. Frank 1987	LA-03673
Wlodarski 1987	LA-00309
Stickel 1993	LA-02904
Raschke et al. 1995	LA-04910
McLean 1998a	LA-04190
Bunse and Mikesell 2000	LA-06240
Duke 2000a	LA-04861
Maki 2000	LA-04907
Wesson et al. 2000	LA-06239
PCR 2001	Not at SCCIC
Duke 2002b	LA-06243
McKenna 2002a	LA-05708
PCR 2003a	Not at SCCIC
Barre 2005	LA-11561
Brian F. Smith and Associates 2005	LA-10857
LAWA 2005	Not at SCCIC
Maki 2005	LA-07722
Getchell and Atwood 2006	LA-07851/LA-11560
Los Angeles 2008	Not at SCCIC
Gust et al. 2009	Not at SCCIC
Richards 2009	LA-09925
White 2009	LA-10622
LAWA 2011	Not at SCCIC
Power 2011	Not at SCCIC
URS 2012	Not at SCCIC
Sapphos 2013	LA-12267
URS 2013	Not at SCCIC
Sapphos 2014	Not at SCCIC
Grand Avenue Parking Area	
Leonard 1974	LA-00096
D'Altroy 1975	LA-04051
Leonard 1975	LA-00125
Leonard 1976	LA-01982
Romani 1976	LA-03494
Myra L. Frank 1987	LA-03673
Wlodarski 1987	LA-00309
Woodward 1987	LA-01625
Peak & Associates 1992	LA-02950
Stickel 1993	LA-02904
Raschke et al. 1995	LA-04910
Bunse and Mikesell 2000	LA-06240
Duke 2000a	LA-04861
Maki 2000	LA-04907
Wesson et al. 2000	LA-06239
JRP 2001	Not at SCCIC
PCR 2001	Not at SCCIC
Duke 2002b	LA-06243
McKenna 2002a	LA-05708
Brian F. Smith and Associates 2005	LA-10857

Author and Date of Study	SCCIC Study Number
LAWA 2005	Not at SCCIC
Maki 2005	LA-07722
Gust et al. 2009	Not at SCCIC
Richards 2009	LA-09925
White 2009	LA-10622
Bonner 2011a, 2011b	LA-11638
Power 2011	Not at SCCIC
Bonner 2012a	LA-11971
Bonner and Crawford 2012	LA-12078
URS 2013	Not at SCCIC
Sapphos 2014	Not at SCCIC
Dockweiler State Beach Parking Area	
Bucknam 1974	LA-03583
Leonard 1974	LA-00096
D'Altroy 1975	LA-04051
Leonard 1975	LA-00125
Leonard 1976	LA-01982
Romani 1976	LA-03494
Myra L. Frank 1987	LA-03673
Wlodarski 1987	LA-00309
Stickel 1993	LA-02904
Raschke et al. 1995	LA-04910
Bunse and Mikesell 2000	LA-06240
Maki 2000	LA-04907
Wesson et al. 2000	LA-06239
PCR 2001	Not at SCCIC
McKenna 2002a	LA-05708
PCR 2003a	Not at SCCIC
Barre 2005	LA-11561
Brian F. Smith and Associates 2005	LA-10857
LAWA 2005	Not at SCCIC
Getchell and Atwood 2006	LA-07851/LA-11560
Los Angeles 2008	Not at SCCIC
Gust et al. 2009	Not at SCCIC
Richards 2009	LA-09925
LAWA 2011	Not at SCCIC
Power 2011	Not at SCCIC
LAWA 2012a	Not at SCCIC
PCR 2012	Not at SCCIC
URS 2012	Not at SCCIC
Sapphos 2013	LA-12267
URS 2013	Not at SCCIC
Sapphos 2014	Not at SCCIC
Kramer Staging Area	
Wlodarski 1986	LA-01543
McKenna 1992	LA-02570
Stickel 1993	LA-02904
McLean 1998b	LA-03955
Duke 1999c	LA-04762
Bonner 2000	LA-06903

Author and Date of Study	SCCIC Study Number
Bunse and Mikesell 2000	LA-06240
Duke 2000b	LA-05560
Jones & Stokes 2000	LA-06249
SAIC 2000	LA-04836
Smith 2000	LA-05499
Wesson et al. 2000	LA-06239
Jones & Stokes 2001	LA-05536
Christy 2002	LA-05756
Parsons 2002	Not at SCCIC
PCR 2003b	Not at SCCIC
CAJ & Associates 2004	Not at SCCIC
SWCA 2006	LA-08255
Bonner 2008	LA-09924
Harper and Smith 2008	LA-10160
Matrix 2012a	Not at SCCIC
McKenna 2012	Not at SCCIC
W. 190th Street Parking/Laydown Area	
Racer 1939a	LA-11482
Clewlow 1974	LA-00114
Eggers 1977	LA-04512
Caltrans 1978	LA-03810
Schroth 1981	LA-01016
Dillon 1984b	LA-01373
Jones & Stokes Associates 1997	LA-03572
Dillon 1985	LA-01467
Smith 2000	LA-05499
Bolin 2001	LA-06875
Foster 2002	LA-06201
Holson 2002	LA-06193
McKenna 2002b	LA-06196
Maxwell 2002	LA-11150
Villalobos 2002	LA-11150
White 2002	LA-06194
Mellon 2003	LA-11150
Tomes 2004	LA-07898
Hogan et al. 2005	LA-10567
Bonner and Crawford 2007	LA-08813
Wlodarski 2010	LA-10438
Amaglio 2012	LA-11716

Staff's literature review indicates that eight cultural resources have previously been recorded in the PAA and 33 cultural resources have previously been recorded within 0.25–1.00 mile of the PAA (**Cultural Resources Tables 5** and **6**).

Cultural Resources Table 5
Literature Search Results: Previously Recorded Cultural Resources in the PAA

Resource Designation	Type	Description	Project Component	CRHR Status	Source
P-19-190098	Structures	Power Plant	Project Site	6Z	Crawford 2012
Location 6	Historic isolate	Glass soda bottle and bottle fragment	Project Site	Recommended ineligible	White et al. 2014:21, 23–24, 28, Figure 4; White and White 2011a:3; White and White 2012a:2
Location 7	Historic isolate	Glass soda bottle	Project Site	Recommended ineligible	White et al. 2014:20, Figure 4
Location 8	Historic refuse[a]	Red brick, soda bottle	Project Site	Recommended ineligible	White et al. 2014:19, Figure 4; White and White 2011b:3–4
Location 9	Historic structural refuse[a]	Red brick, concrete, and fire brick fragments	Project Site	Recommended ineligible	White et al. 2014:18–19, Figure 4
Location 13	Historic structural refuse[a]	Two fire bricks and fire brick fragment	Project Site	Determined ineligible	Dyas 2012; White et al. 2014:21, 24, Figure 4; White and White 2011a:3; White and White 2012b:2–3
Location 16	Historic isolate	Bottle	Project Site	Recommended ineligible	White et al. 2014:26, Figure 4; White and White 2012c:4–5
P-19-000088/CA-LAN-88 (formerly LAn-102, Site No. 14, unnamed sites)	Prehistoric sites	Shell and lithic scatter, multiple small shell middens and workshops	W. 190th Street Parking/Laydown Area	Unevaluated	Racer 1939a:5, 7; 1939b; Rozaire 1951a, 1951b

a. White et al. (2014:28) classified these finds as isolates. Staff follows guidance from OHP (1989:2, 1995:3) in defining archaeological sites and isolates.
Abbreviations: CRHR = California Register of Historical Resources; OHP = Office of Historic Preservation; PAA = project area of analysis

Cultural Resources Table 6
Literature Search Results: Previously Recorded Cultural Resources within 0.25–1.00 Mile of PAA

Resource Designation	Type	Description	Project Component	CRHR Status	Source
P-19-189240	Structure	Residence	Project Site	1CS	Kirk 2008a
P-19-189244	Structure	Residence	Project Site	7W	Kirk 2008b
HRI-073012	Structure	Municipal	Project Site	7W	Haskell 1991[23]
Location 1	Historic structural refuse	Fire brick, two fire brick fragments	Project Site	Recommended ineligible	White et al. 2014:20, 22, Figure 4; White and White 2011c:3
Location 2	Historic structural refuse	Red brick fragments	Project Site	Recommended ineligible	White et al. 2014:18, 28, Figure 4
Location 3	Historic plate	Glass bottle, brick fragment	Project Site	Recommended ineligible	White et al. 2014:21–22, Figure 4; White and White 2011d:3
Location 4	Historic fuse	Fire brick, two fire brick fragments, glass bottle	Project Site	Recommended ineligible	White et al. 2014:18, 20–23, 28, Figure 4; White and White 2011c:3, 2011e:3
Location 5	Historic plate	Railroad tie, armored electrical table	Project Site	Recommended ineligible	White et al. 2014:15–16, 28, Figure 4
Location 10	Historic plate	Two fire brick fragments	Project Site	Recommended ineligible	White et al. 2014:19, 28, Figure 4; White and White 2011b:3–4
Location 11	Historic plate	Glass bottle	Project Site	Recommended ineligible	White et al. 2014:24, 28, Figure 4; White and White 2012e:2–3
Location 12	Historic plate	Two glass bottles	Project Site	Recommended ineligible	White et al. 2014:25–26, 28, Figure 4; White and White 2012d:2–3
Location 14	Modern refuse scatter—not a cultural resource	Animal bone and fragments, two glass bottles, metal fragments	Project Site	Recommended ineligible	White et al. 2014:22, 28, Figure 4; White and White 2011c:3
Location 15	Historic	Glass bottle,	Project Site	Recommended	White et al.

[23] Document provided by SCCIC/OHP at staff's request. It was not included in literature search results provided by petitioner.

Resource Designation	Type	Description	Project Component	CRHR Status	Source
	blate	four non-historic glass bottles		ineligible	2014:22–23, 28, Figure 4; White and White 2011d:3–4; White and White 2012a:2
P-19-202	Not a cultural resources	Pleistocene-aged shell	LAX Pershing Staging/Parking Area; Hyperion Parking Area; Dockweiler State Beach Parking Area	Not eligible	Bissell 1995a; Eberhart 1953a, 1953b; King 1968
P-19-00691 (CA-LAN-691)	Prehistoric archaeological site	Shell scatter	LAX Pershing Staging/Parking Area; Hyperion Parking Area; Grand Avenue Parking Area; Dockweiler State Beach Parking Area	Recommended ineligible for NRHP	D'Altroy 1975; Leonard 1974:7; Lewis 1987:2; Raschke et al. 1995:14–15; Richards 2009:iii, 19
P-19-002345 (CA-LAN-2345)	Prehistoric archaeological site, partially buried	Stone tools, bones, shell fragments, fire-affected rock, and potential hearth feature	LAX Pershing Staging/Parking Area; Hyperion Parking Area; Grand Avenue Parking Area; Dockweiler State Beach Parking Area	Recommended eligible for NRHP, CRHR, LAHCM, local listing (city of Inglewood)	Bissell 1995b; Los Angeles 2004:Table F4.9.1-4
P-19-002385 (CA-LAN-2385H), CA-LAN-*1H	Historic archaeological site	Structural and domestic refuse	LAX Pershing Staging/Parking Area; Dockweiler State Beach Parking Area	Not evaluated	Bissell 1995c; Raschke et al. 1995:24–25
P-19-002386 (CA-LAN-2386H), CA-LAN-*2H	Historic structure	Military Bunker	LAX Pershing Staging/Parking Area; Hyperion Parking Area; Dockweiler State Beach Parking Area	NRHP-eligible contributor to historic district; eligible for CRHR and LAHCM	Bissell 1995d; FAA 2005:29; Los Angeles 2004:4-821; Ostashay 2000; PCR 2001:54
P-19-004352	Prehistoric archaeological site	Unknown	LAX Pershing Staging/Parking Area; Dockweiler State Beach Parking Area	Unknown	ESEC 2014b:Attach-ment DR78-1
P-19-004353 (Scattergood-2)	Buried historic refuse; bone and/or shell potentially historic	Bottle fragment, five mammal bone fragments, shell fragment	LAX Pershing Staging/Parking Area; Hyperion Parking Area; Grand Avenue Parking Area;	Unknown	ESEC 2014b:Table DR78-3; Ortiz 2013a

Resource Designation	Type	Description	Project Component	CRHR Status	Source
			Dockweiler State Beach Parking Area		
P-19-004354 (Scattergood-3)	Buried historic refuse	Four glass bottles, three glass bottle fragments	LAX Pershing Staging/Parking Area; Hyperion Parking Area; Dockweiler State Beach Parking Area	Unknown	ESEC 2014b:Table DR78-3; Ortiz 2013b
P-19-100115, Isolate 1	Prehistoric isolate	Edge-modified flake, felsite porphyry	LAX Pershing Staging/Parking Area; Dockweiler State Beach Parking Area	Not eligible for CRHR	Bissell 1995e; Raschke et al. 1995:24
P-19-100116, Isolate 2	Prehistoric isolate	Flake, quartzite	LAX Pershing Staging/Parking Area; Dockweiler State Beach Parking Area	Not eligible for CRHR	Bissell 1995f; Raschke et al. 1995:24
P-19-177369	Unknown	Unknown	W. 190th Street Parking/Laydown Area	Unknown	ESEC 2014b:Attach-ment DR78-1
P-19-186162	Historic building	LAX Control Tower (ca. 1951–1961)	LAX Pershing Staging/Parking Area	Unevaluated for CRHR; ineligible for NRHP	Getchell and Atwood 2006:ii
P-19-186856	Historic archaeological	H. Kramer Company Foundry's foundations, slag heap	Kramer Staging Area	Unevaluated	Bass 2000; Wesson et al. 2000:24, 32
P-19-190099	Unknown	Unknown	LAX Pershing Staging/Parking Area	Unknown	ESEC 2014b:Attach-ment DR78-1
P-19-190098	Structures	Power Plant	Chevron Marine Terminal Staging Area; Grand Avenue Parking Area	6Z	Crawford 2012
P-19-000088/CA-LAN-88 (formerly LAn-102, Site No. 14, unnamed sites)	Prehistoric sites	Shell and lithic scatter, multiple small shell middens and workshops	W. 190th Street Parking/Laydown Area	Unevaluated	Racer 1939a:5, 7; 1939b; Rozaire 1951a, 1951b
P-19-000101	Prehistoric archaeological site	Human remains and artifacts	W. 190th Street Parking/Laydown Area	Unevaluated	Racer 1939a:5
P-19-187898	Unknown	Unknown	W. 190th Street Parking/Laydown Area	Unknown	ESEC 2014b:Attach-ment DR78-1
P-19-190001	Unknown	Unknown	W. 190th Street	Unknown	ESEC

Resource Designation	Type	Description	Project Component	CRHR Status	Source
			Parking/Laydown Area		2014b:Attachment DR78-1
P-19-190646	Structure	Transmission Tower	W. 190th Street Parking/Laydown Area		Crawford 2013
Notes: CRHR = California Register of Historical Resources; LAHCM = Los Angeles Historic-Cultural Monuments; LAX = Los Angeles International Airport; NRHP = National Register of Historic Places					

Additional Research

Staff reviewed literature relating to project-area archaeological, ethnographic, and historic built environment resources. The purpose of this research was to obtain a visual understanding of the natural and cultural development of the land in and around the PAA and identify locations of potential historic built environment and ethnographic resources. To this end, staff attempted to locate detailed maps of the PAA at 10-year intervals[24], beginning about A.D. 1769 and moving toward the present. All consulted historic maps are presented in **Cultural Resources Table 7**.

Cultural Resources Table 7
Historic Maps Consulted

Map Name	Scale	Survey Date(s)	Reference
Survey Plat, T 3 S, R 14 W	Not given	1853, 1857, 1868	GLO 1868
Patent Map of Rancho San Pedro	1 inch = 60 chains	December 1857	GLO 1858
Patent Map of Rancho Sausal Redondo	1 inch = 80 chains	1868	GLO 1875
Map of Private Grants and Public Lands	Not given	1869	Day 1869
Redondo Sheet	1 inch = 1 mile	1894	EDR 2000a; USGS 1896
Southern California, Sheet 1	1:250,000	About 1901	EDR 2000a
Torrance Quadrangle	1 inch = 2,000 feet	About 1924	EDR 2011a
Aerial Photograph	Not given	1928	EDR 2000b
Oblique Aerial Photograph	Not given	1930	Noble 2014:Figure 2
Inglewood Quadrangle	1 inch = 2,000 feet	About 1930	White et al. 2008:Figure 5
Venice Quadrangle	1 inch = 2,000 feet	About 1934	White et al. 2008:Figures 2–3
Torrance Quadrangle	1 inch = 2,000 feet	About 1934	EDR 2011a
Aerial Photograph	Not given	1938	Noble 2014:Figure 2

[24] Five- to 10-year intervals are widely regarded as a reasonable basis on which to observe mapped changes in landscapes and settlement patterns in historical research (Conzen 1990:189).

Map Name	Scale	Survey Date(s)	Reference
Redondo Quadrangle	1 inch = 1 mile	Surveyed 1923, aerial photographs taken 1942	COE 1944; EDR 2000a
Aerial Photograph	Not given	1947	EDR 2000b
Redondo Quadrangle	1:50,000	About 1948	EDR 2011a
Unnamed Quadrangle	1 inch = 2,000 feet	About 1950	EDR 2000a
Aerial Photograph	Not given	1953	EDR 2000b
Aerial Photograph	Not given	1954	Noble 2014:Figure 3
Aerial Photograph	Not given	1959	Noble 2014:Figure 3
Aerial Photograph	Not given	1960	Noble 2014:Figure 4
Unnamed Quadrangle	1 inch = 2,000 feet	About 1964	EDR 2000a
Aerial Photograph	Not given	1965	Noble 2014:Figure 4
Aerial Photograph	Not given	1968	EDR 2000b

Native American Consultation

Methods

Native American Heritage Commission

The Governor's Executive Order B-10-11, executed on September 19, 2011, directs state agencies to engage in meaningful consultation with California Indian Tribes on matters that may affect tribal communities. The California Resources Agency has adopted a Final Tribal Consultation Policy on November 20, 2012. The recently adopted policy extols informed decision making by collaboratively working with tribes to seek positive, achievable, and durable outcomes. The Energy Commission Siting Regulations require applicants to contact the NAHC for information on Native American sacred sites and a list of Native Americans interested in the project vicinity. The applicant is then required to notify the Native Americans on the NAHC's list about the project and include a copy of all correspondence with the NAHC and Native Americans and any written responses received, as well as a written summary of any oral responses in the application or petition (Cal. Code Regs., tit. 20, § 1704[b][2], Appendix B[g][2][D]).

The NAHC is the primary California government agency responsible for identifying and cataloging Native American cultural resources, providing protection to Native American human burials and skeletal remains from vandalism and inadvertent destruction, and preventing irreparable damage to designated sacred sites and interference with the expression of Native American religion in California. It also provides a legal means by which Native American descendents can make known their concerns regarding the need for sensitive treatment and disposition of Native American burials, skeletal remains, and items associated with Native American burials.

The NAHC maintains two databases to assist cultural resources specialists in identifying cultural resources of concern to California Native Americans, referred to by staff as Native American ethnographic resources. The NAHC's Sacred Lands database has records for areas, places, sites and objects that Native Americans consider sacred or otherwise important, such as cemeteries and gathering places for traditional foods and materials. Their Contacts database has the names and contact information for

individuals, representing a group or themselves, who have expressed an interest in being contacted about development projects in specified areas.

Results

Results of Inquiries Made to NAHC and NAHC-listed Native American Entities
Staff requested information on the presence of sacred lands in the vicinity of the proposed project, as well as a list of Native Americans to whom inquiries should be sent to identify both additional cultural resources and any concerns the Native Americans may have about the proposed project.

Staff contacted the NAHC on September 11, 2013, and requested a search of the Sacred Lands File and a Native American contacts list. The NAHC responded on September 19, 2013, with a list of Native Americans interested in consulting on development projects in the project area. A check of the NAHC sacred lands files resulted in negative findings within the project site. Staff sent letters to all of the NAHC-listed tribes on September 30, 2013, inviting them to comment on the proposed project and offered to hold face-to-face consultation meetings if any tribal entities so requested. Follow-up phone calls were made by staff on October 2, 2013. Subsequent email and phone conversations also occurred on October 7 and 8, 2013. Staff received several verbal comments and one written comment from tribal entities that tribal monitors should be required during project ground disturbing activities (Dunlap 2014).

Consultation with Others

Staff consulted with the city of El Segundo with regards to the history of the area and locally listed historical resources.

Environmental Justice/Socioeconomic Methods

In accordance with federal and state law, regulations, policies, and guidance, staff considered the proposed amendment's potential to cause significant adverse impacts on environmental justice populations (E.O. 12898; 40 C.F.R. §§ 1508.8, 1508.14; Cal. Code Regs., tit. 14, §§ 15064(e), 15131, 15382; Cal. Code Regs., tit. 20, § 1704(b)(2), App. B(g)(7); CEQ 1997). **Socioeconomics Figure 1** indicates that an environmental justice population exists within a six-mile buffer of the proposed amendment area (see the **Socioeconomics** section of this FSA for a discussion of methods and composition of the environmental justice population). In addition, staff reviewed the ethnographic and historical literature, and corresponded with Native American tribes, to determine whether any additional environmental justice populations use or reside in the PAA. These efforts are documented in the "Ethnographic Setting" and "Native American Consultation" subsections of this FSA.

Cultural Resources Distribution Models

One critical use of the information drawn together during the background research for a cultural resources analysis is to inform the design and the interpretation of the field research that will complete the cultural resources inventory for the analysis. A further role of background research is to help develop predictive or anticipatory models of the distribution of cultural resources across the PAA. Such models of the types of archaeological, ethnographic, and built-environment resources, and the patterns of their distribution across and beneath the surface of the landforms of the PAA, provide the

means to tailor more appropriate research designs for the field investigations that will complete a cultural resources inventory, and help gauge the degree to which the results of those investigations may reflect the actual population of archaeological, ethnographic, and built-environment resources in the PAA. Such models also provide important contexts for the ultimate interpretation of the results of those investigations.

Models of the distribution of prehistoric archaeological sites, of ethnographic resources, and of historical archaeological sites and built-environment resources are developed here and draw on information above in the “Environmental Setting,” “Prehistoric Setting,” “Ethnographic Setting,” and “Historic Setting” subsections, in addition to the above information in the “Background Research” subsection. Staff formulated data requests during the discovery phase of the present certification process on the basis these models to ensure the collection of enough information to factually support the conclusions of this analysis. The discussions in the “Interpretation of Results” subsection below also employ the models.

Model of Prehistoric Archaeological Resources

The analysis of the information in the “Environmental Setting,” “Prehistoric Setting,” and “Background Research” subsections leads to the conclusion that the likelihood of prehistoric archaeological deposits across the surface of the PAA is low and subsurface prehistoric archaeological deposits might be present in the PAA.

According to the “Geology” subsection above, the sandy ocean shoreline present today formed by 5000 B.P. El Segundo Sand Hills developed earlier, beginning about 7000 B.P. and capping the Pleistocene-aged Older Alluvium. Within one mile of the PAA, five prehistoric archaeological resources have been identified in the El Segundo Sand Hills (**Cultural Resources Table 5**). Staff research has identified six additional archaeological resources within the El Segundo Sandhills north of the PAA: CA-LAN-47, CA-LAN-59, CA-LAN-61, CA-LAN-63, CA-LAN-64, and CA-LAN-206 (Altschul et al. 2005:287, Figure 1; Burnham and Romoli 1965; Johnson 1961; Wesson et al. 2000:Figure J-2). This makes for 11 archaeological resources known in the El Segundo Sandhills. The extent of paving, prior excavation, and grading in the PAA renders the likelihood of encountering prehistoric archaeological resources on the ground surface very low.

Despite the low potential to identify prehistoric archaeological resources on the surface of the PAA, the present ground surface does not account for the entire span of human occupation on this section of coast. This is evident in that one previously recorded archaeological site, P-19-2345, was found partially buried and resting atop a Pleistocene-age landform (Bissell 1995b:1; Los Angeles 2008:8-818, 8-819). CA-LAN-47, a shell midden, has also been found beneath 1–2 feet of overburden within the El Segundo Sandhills (Burnham and Romoli 1965; Johnson 1961; Wesson et al. 2000:Figure J-2).

Whether the project owner would encounter buried prehistoric archaeological deposits during construction depends on several factors, including the depositional character and the ages of the sedimentary deposits that construction would disturb, the presence of buried land surfaces or buried surfaces of ancient soils (paleosols), the duration or stability of any paleosols, the post-depositional character of geomorphic processes in

the PAA, and the nature of past human activities in the area. Staff's analysis indicates that the proposed project site is in a depositional environment where buried prehistoric archaeological materials have the potential to be found. Much or all of any such deposition would have occurred within the last 10,000 years. Given these qualities of the PAA, staff believes that the PAA might contain buried prehistoric archaeological resources.

Model of Historic Archaeological Resources

The likelihood of encountering historic archaeological resources on the ground surface of the PAA is minimal; the PAA has been adequately surveyed for the presence of cultural resources, and none were found. Additionally, the majority of the PAA is paved or graveled, such that the historic artifact-bearing surfaces are all covered by asphalt or gravel.

The probability of finding historic archaeological resources buried in the PAA varies with location and proposed construction activities under the PTA. The proposed parking/laydown areas are situated on paved or graveled surfaces. No excavation or other ground disturbance is proposed at these locations. Staff therefore sees no potential to encounter buried historic archaeological resources in the proposed parking/laydown areas.

The project owner proposes excavation within the project site, however, and could encounter historic archaeological resources in the process of ground disturbance. Staff's research using historic maps suggests that any buried historic archaeological resources within the project site would fall within a restricted range of resource types. Staff's review of historic maps of the project vicinity covered the years 1868 to 1968 (see **Cultural Resources Table 7**). Historic maps depict a complete lack of development within the current project site until sometime between 1928 and 1934. During this interval, the Pacific Electric Railroad Company had built tracks along the beachfront from Redondo Beach north through El Segundo. Coast Boulevard paralleled the tracks. (EDR 2000a, 2000b; GLO 1875; USGS 1896; White et al. 2008:Figures 2–3.) Coast Boulevard was renamed Highland Avenue between 1934 and 1953; the road maintained the same course until at least 1953 (Bechtel 1953). The Pacific Electric Railroad tracks are not evident on aerial photographs dating to 1947 and 1953 (EDR 2000b), presumably having been removed. Construction of the ESGS had commenced by 1953 (EDR 2000b). Historic archaeological materials that could be expected on the project site therefore would be associated with railroad construction, operation, and demolition; road construction, use, and demolition; and power plant construction, operation, and demolition. Archaeological materials of these sorts would comprise building and structure foundations (primarily concrete and brick); other structural remnants (concrete, metal, brick, and glass); railroad ties, rails, and ballast; and discarded refuse during construction, use, and demolition of the three types of facilities mentioned. Personal effects such as beverage and food containers would be expected.

Model of Ethnographic Resources

Ethnography fulfills a supporting role for other anthropological disciplines as well as contributions on its own merits. Ethnography provides a supporting role to the discipline of archaeology by providing a cultural and historic context for understanding the people

that are associated with the material remains of the past. By understanding the cultural milieu in which archaeological sites and artifacts were manufactured, utilized, or cherished, this additional information can provide greater understanding for identification efforts, making significance determinations per the NHPA or CEQA; eligibility determinations for the NRHP or the CRHR; and for assessing if and how artifacts are subject to other cultural resources laws, such as the Native American Graves Protection and Repatriation Act.

In addition, ethnography has merits of its own by providing information concerning ethnographic resources that tend to encompass physical places, areas, or elements or attributes of a place or area. Ethnographic resources have overlap and affinity to historic preservation property types referred to as cultural landscapes, traditional cultural properties, sacred sites, heritage resources, historic properties, or historical resources that are areas or places, and specific historic property or historical resource types of sites, objects, buildings, structures, districts, areas or places. There is notable overlap in terminology when referring to ethnographic resources. Studies that focus on specific ethnographic resource types may also take on names such as ethnogeography, ethnobotany, ethnozoology, ethnosemantics, ethnomusicology, etc. In general, the ethnographic endeavor attempts to minimize human conflict by facilitating an iterative cross-cultural understanding and, by extension, self-awareness.

While several definitions of ethnographic resources can be found in historic preservation literature, the National Park Service (NPS) provides the most succinct and commonly used definition (NPS 2007:Chapter10):

> Ethnographic resources are variations of natural resources and standard cultural resource types. They are subsistence and ceremonial locales and sites, structures, objects, and rural and urban landscapes assigned cultural significance by traditional users. The decision to call resources "ethnographic" depends on whether associated peoples perceive them as traditionally meaningful to their identity as a group and the survival of their life ways.

Ethnographic Methods

Ethnographic methods, when applied to projects of limited size and scope involve four steps.[25]

Step 1 involves reviewing the project description and mapped project location and, based upon the geographic and environmental setting, formulate preliminary guiding questions that may be asked of people with cultural affiliation to the project area.

Step 2 involves contacting, informally discussing with, (or formally interviewing) people whom might have a cultural relationship or affiliation to a given area.

As Step 2 is being conducted, a parallel Step 3 involves archival “search, retrieve, and assess” process that should be undertaken to provide supporting or conflicting information to what is being discovered through the discussion process. In addition to archive, book store, and other informational repositories (e.g., the internet), the people

[25] See Pelto (2013:Chapter 16) for an overview of applied ethnographic methods for conducting focused inquiry conducted in limited timeframes.

themselves or other ethnographers with previous experiences with the same people, may provide source materials. Findings in Step 3 may require a repetition of Step 2.

Step 4 involves field visit(s) that are intended to help the ethnographer triangulate between what people currently say, what people have written in the past, and what is actually or perceived to be in the project vicinity as a potential ethnographic resource.

Preliminary Guiding Questions

Based upon the project description and project location maps two preliminary Guiding Questions were developed.

- Research specific Gabrielino Tongva procurement and usage of resources found in Southern California coastal environments and specifically the area near El Segundo.
- Research the history of Gabrielino Tongva settlements in the coastal area near the project area and specifically research the Island Gabrielino Tongva affiliations with mainland settlement in the coastal area at and immediately north and south of the project area.

As documented previously in this cultural resources section (*Native American Consultation*), staff made effort to make preliminary contact with Gabrielinos and affiliated with the project area. One meeting was held with a representative of the Gabrielino Tongva Nation who expressed a need to have Native American monitors present during ground disturbing activities.

Because staff did not identify ethnographic resources in the PAA, and because tribal responses were minimal, staff did not conduct ethnographic interviews with tribal people.

Archival Research

Staff made efforts to seek, obtain, and assess culturally relevant information from various archival sources. Information specifically sought related to the relation between Island and mainland Gabrielino Tongva. The Bowers Museum, located in Santa Ana, California, was visited to view Gabrielino Tongva cultural material on display. The California History Room of the California State Library, located in Sacramento, was also used for retrieving ethnographic information beyond what was provided in the Smithsonian's Handbook of North American Indians, Volume 8, California, "Gabrielino" chapter.

Field Visit

Ethnographic staff visited the project area (see "Staff Site Visit" below).

Ethnographic Method Constraints

Constraints on the ethnographic methods described above were non-existent.

Cultural Resources Inventory Fieldwork

The current field efforts to identify cultural resources in the PAA consist of the project owner's historic built-environment survey of the project site conducted in 2013 (JRP 2013), and staff field visits to the PAA. These efforts resulted in the identification of

eleven historic-age built-environment resources, including the El Segundo Energy Center (previously known as the El Segundo Generating Station), the Chevron Refinery complex and nine properties on 45th Street in Manhattan Beach to the south of the project. On the basis of the background research, consultation, and the results of the current field effort, the total cultural resources inventory for the PAA consists of eleven built-environment resources. As mentioned earlier, no other survey information was requested or received by built environment staff for the PTA.

This section discusses the methods and the results of each field inventory phase and interprets the resultant inventory relative to the cultural resources distribution models above to assess how well the inventory represents the archaeology of the project vicinity. Descriptions of each cultural resource in the inventory, evaluations of the eligibility of each resource for inclusion in the CRHR, assessments of project impacts on each known historical resource, consideration of and potential impacts on archaeological resources that may lie buried on the project site, and proposed mitigation measures for significant impacts may be found in the "California Register of Historical Resources Eligibility" and "Identification and Assessment of Direct Impacts on Built-Environment Resources and Proposed Mitigation" subsections below.

Staff Site Visits

Staff archaeologist, Gabriel Roark, and staff ethnographer Thomas Gates conducted a site visit of the project site on October 8, 2013. Staff met with on-site environmental compliance manager Scott Seipel; the Cultural Resources Specialist for then-ongoing construction at the ESEC, Robert S. White; and project manager Robert Mason of CH2M Hill, consultant to the project owner. Mr. Seipel provided a tour of the ESPFM, and in tandem with Mr. White, provided information about the depth of previous excavations and other disturbance within the bounds of the project site. This information is summarized in **Cultural Resources Table 2**. In addition, Mr. White, who observed most or all construction-related excavation in the most recent phases of work at the ESEC, stated that it is difficult to visually distinguish imported fill from native, undisturbed sand (Robert White, personal communication, 2013).

Built environment staff Melissa Mourkas visited the project site, met with on-site environmental compliance manager Scott Seipel, and completed a visual reconnaissance survey of the adjacent parcels, and the laydown and parking areas on February 14, 2014.

Results of Ethnographic Resources Investigations

Staff research and the site visits leads staff to suggest that any ethnographic resources that may be in the project vicinity are likely to not be in the project site, because the project site is predominately located on an ocean side bluff and areas just above the present day surf line. However, the coastline in this area is dynamic and shifts and there is always the possibility of inadvertent discoveries in such dynamic beach and ocean side bluff environments.

As a result of ethnographic research, staff concludes that there are no known ethnographic resources that would be impacted by the proposed project.

Historic Built Environment Survey

Methods

The project owner commissioned a historic built environment survey of the project site in response to staff Data Request 82 (see CEC 2013b:26). JRP Historical Consulting conducted the historic built-environment survey on November 25, 2013. Fieldwork methods appear to have consisted of photographic documentation, visual inspection, field notes, and conversations with on-site environmental compliance manager Scott Seipel. (JRP 2013:2.)

The El Segundo Energy Center has been evaluated and recorded (JRP 2013) in accordance with the CEQA Guidelines and the implementing regulations of Section 106 of the NHPA (14 Calif. Code Regs., §§ 15064.5 (a)(2)–(3); 36 C.F.R. § 800). A discussion of the resource follows.

Results

The inventory of cultural resources in a PAA is the collective result of archival and literature research, discussions with local governments and public interest groups, and field investigations conducted both by staff and the project owner.

Cultural Resource Descriptions and Significance Evaluations

Archaeological Resources

A total of seven archaeological resources have been identified in the PAA, six of which are located on the project site and one of which is located in or adjacent to the W. 190th Street Parking/Laydown Area (see **Cultural Resources Table 5**).

Location 6

Cultural resources monitors identified two historic-period isolated artifacts during construction excavations between Units 3 and 4 on June 9 and December 30, 2011. The June 9th find consists of a clear glass Pepsi-Cola bottle. Based on the manufacturing characteristics of the bottle and its maker's mark, the bottle was made between 1951 and 1958. (White et al. 2014:21.) The second isolate, found in construction fill on December 30th, was a green glass bottle neck and partial lip (White et al. 2014:23–24). The bottle has a cork-closure mouth (White and White 2012a:Plate V). The bottle has not been dated. Construction excavation had proceeded to about 11 feet below then-current grade, encountering native sediments. However, the bottle fragment was identified in a backdirt pile, rendering its origin questionable; it could just as easily have been contained in the fill layer prior to excavation as native sediments (White 2012a:2). The Cultural Resources Specialist (CRS) responsible for the cultural resources monitoring program in 2011 recommended both artifacts ineligible for listing in the CRHR (White and White 2011a:3; White and White 2012a:2).

Isolated finds are rarely considered historical resources or unique archaeological resources for the purposes of CEQA. Important associations with historically significant events, trends, or persons cannot be drawn to these two artifacts (CRHR Criteria 1 and 2), they are both commonplace artifact types (CRHR Criterion 3), and the information potential of both bottles was exhausted in the process of recordation (CRHR Criterion

4). Therefore, the historic isolates found at Location 6 do not qualify as historical or unique archaeological resources under CEQA and do not require further management.

Location 7

Cultural resources monitors identified a 6-ounce Coca-Cola bottle during construction on May 10, 2011. The clear glass container was bottled in 1944. (White et al. 2014:20.)

As with the isolates found at Location 6 (see above), this single bottle does not constitute a historical or unique archaeological resource for the purposes of CEQA and requires no further management consideration.

Location 8

On April 19, 2011, cultural resources monitors identified “a crudely made red brick” and a green glass Coca-Cola bottle during construction. The container was bottled at the Owens-Illinois bottling plant in Los Angeles in 1947. (White et al. 2014:19.)

The artifacts identified at Location 8 cannot be clearly associated with historically significant events, trends, or persons (CRHR Criteria 1 and 2), do not represent the work of a master or significant creative individual (CRHR Criterion 3), and possess limited information potential that was exhausted in the process of their recordation (CRHR Criterion 4). Staff therefore recommends that these two artifacts at Location 8 do not qualify as a historical or unique archaeological resource for the purposes of CEQA.

Location 9

A total of nine historic artifacts were identified in an area identified as “Location 9” between March 16 and April 12, 2011. The artifacts consisted of a red brick fragment, a piece of concrete, and seven fire brick fragments. On March 16, 2011, a cultural resources monitor (CRM) recovered an unmarked, crudely made red brick fragment from an exploratory pit dug during construction. The CRM identified a concrete fragment with a beveled corner in an excavated trench near the construction office trailers on March 22, 2011. The CRM recovered an additional four fire brick fragments from the same trench on March 31, 2011. Three of the fire brick specimens were manufactured by the A.P. Green Fire Brick Company of Mexico, Missouri. A.P. Green had an office in San Francisco and the company’s bricks were commonplace in California. These particular bricks were made between 1929 and 1942. The fourth, mostly intact fire brick was a Diablo fire brick made by the Gladding, McBean & Company, headquartered in Stockton, California. The brick was made between 1943 and 1962. (White et al. 2014:18–19.)

April 2011 finds at Location 9 consisted of three fire brick fragments. The CRM found two fire brick fragments in the back dirt piles from excavation of the trench west of the modular trailers. One brick fragment was unmarked, the other stamped “3 ½”, but also of indeterminate origin. (White et al. 2014:19.) White and White (2011b:4) tentatively concludes that the brick fragments found in April 2011 were rubble that was mixed with native soil when the NRG facility was first graded. Another untypable fire brick fragment was found in the same general area as the April 1, 2011 finds (White et al. 2014:19).

The CRS recommended the artifacts found at Location 9 as non-significant cultural resources because the artifacts had little information potential (White et al. 2014:27–28). Staff agrees that the artifacts at Location 9 do not constitute historical or unique archaeological resources for the purposes of CEQA.

Location 13

The CRM identified three artifacts during construction at Location 13, one on June 7, 2011 and two on February 23, 2012. The June 7 find consisted of an unmarked fire brick fragment recovered from the sea wall/rip-rap construction area, a location once traversed by the original sea wall (built ca. 1950). Because no other artifacts or features were found near the fire brick, the CRS treated it as an isolated find that did not qualify as an historical or unique archaeological resource under CEQA. (White et al. 2014:21, 24, 28.)

On February 23, 2012, the CRM recovered two unmarked red bricks from the sea wall construction trench/rip-rap area. The CRS noted that similar "isolated bricks and brick fragments have been discovered in association with the original plant footings and utilities across the northern portion of the site." (White et al. 2014:24.) The weekly monitoring report for February 20–24, 2012 states that the second red brick was "situated evenly with the southerly end of Unit 4", while the first brick was found 80 feet north of the first (White 2012b:1). The CRS treated these finds as isolated finds that do not qualify as historical or unique archaeological resources under CEQA (White 2012b:1; White et al. 2014:24). Staff agrees with this assessment of the finds at Location 13.

Location 16

On July 18, 2012, construction personnel found a historic-age Pepsi soda bottle in a backdirt pile near the entrance to the tank farm. Construction personnel informed the CRM that the backdirt originated from an excavation conducted at the gas compressor building to the north of the backdirt pile. The CRM examined the backdirt pile and the excavation area; no additional artifacts were found. The bottle was manufactured by the Owens-Illinois Glass Company and filled in 1957. (White et al. 2014:26.)

P-19-000088 (CA-LAN-88)

CA-LAN-88 was originally recorded as a small site on the bank of Lagunas de los Dominguez (now Dominguez Channel) consisting of sea shells, flint debitage, and broken handstones (Racer 1939a:5). Rozaire (1951a) appears to have later expanded this site designation to include other archaeological resources in the vicinity, characterizing them as small, hard to find, and possessed of very few artifacts. No physical evidence of CA-LAN-88 has been found in the W. 190th Street Parking/Laydown Area. Given that no excavation or other ground disturbance is proposed at this paved location, staff concludes that the proposed amendment would not result in any impacts to CA-LAN-88. No further assessment is required with respect to CA-LAN-88 for the proposed amendment.

Ethnographic Resources

No ethnographic resources were identified in the PAA as a result of staff's analysis.

Historic Built Environment Resources

El Segundo Energy Center

The petitioner provided an updated evaluation of the ESEC's built environment features in response to staff's Data Request 82 (JRP 2013; LL 2013). The conclusion was reached that ESEC does not appear to meet the criteria for listing in either the NRHP or the CRHR and thus does not qualify as an historical resource for the purposes of CEQA. The resources that were evaluated are listed below in **Cultural Resources Table 8**.

Cultural Resources Table 8
El Segundo Energy Center: Existing Structures over 45 Years of Age

Building/Structure	Date of Construction	CRHR/NRHP Eligibility	Recorded By	Demolition or Decommission Proposed
Units 3 & 4	1964–1965	Not Eligible	JRP 2013	Yes
Seawater Intake for 3 & 4	1964–1965	Not Eligible	JRP 2013	Yes
Cutter Tank	ca.1955	Not Eligible	JRP 2013	No
Guardhouse	ca. 1955	Not Eligible	JRP 2013	No
Retention Basins	ca. 1955	Not Eligible	JRP 2013	Yes
Small Storage Buildings within Unit 3 & 4 Blocks	ca. 1955	Not Eligible	JRP 2013	Yes

This updated evaluation was required because the original evaluation, prepared in October 2000, did not address the ESEC structures that have now become historic in age. At the time, the ESEC property was evaluated under NRHP Criterion Consideration G, which allows for evaluation of properties less than 50 years old for "exceptional importance". It was concluded in 2000 that the ESEC was "not exceptionally significant within the context of the development of SCE or as a steam power plant from the post-war era" (JRP 2013:i). The evaluation completed in 2000 primarily focused on Plants 1 and 2 and found them ineligible for listing on the NRHP and CRHR (JRP 2000:15–19). Units 1 and 2 have been demolished and new facilities built to replace them.

ESEC (historically known as El Segundo Generating Station, or ESGS) Units 3 and 4 are the primary focus of the 2013 investigation, as they date to 1964–1965, placing them within the historic age period of 45 years or older (under NRHP guidelines). As of 2014, the plants are now 50 years old. Ancillary structures are also included in the evaluation (see **Cultural Resources Table 8** above).

The evaluation concludes that ESEC is "not significant within the context of electric power generation, steam power plants or the history of SCE (Criterion 1/A)". The plant is one of many built at that time and is very similar in design and "does not stand out as particularly important within the SCE system" (JRP 2013:24).

The evaluation concludes that to be eligible under Criterion B/2, ESEC would need to be associated with a significant person and this does not appear to be the case. Built as

an outdoor, steam generating power plant similar in design to many others built at that time, ESEC does not appear to have any unique characteristics that would make it eligible under Criterion 3/C. It does not appear to provide the opportunity to be a potential source of important information in history under Criterion D/4. (JRP 2013:24.)

Staff concurs with the conclusion above that the ESEC is not eligible for listing on the NRHP or the CRHR for the reasons given in the evaluation and staff's independent analysis.

Additional Historic Built Environment Resources

Within a one mile radius of the project site, several built environment historic resources have been identified through the literature search results and staff investigation. The following are listed as landmarks on a local register:

- Scott House, Manhattan Beach;
- Salaman House, Manhattan Beach.

The following is listed on the CRHR:

- Scott House, Manhattan Beach.

The following is not listed on any register but based on a 1991 preliminary evaluation (Haskell 1991), staff concludes it is potentially eligible at the local, state and national level were additional evaluation completed:

- Urho Saari Swim Stadium, El Segundo.

The following are identified by the city of El Segundo as structures of historic significance in the Richmond Street District (El Segundo 2000:Exhibit 7):

- Richmond Street: 115, 117, 121, 123–129, 131, 135, 139 140, 142, 143–147, 203, 209, 211–213, 215, 216–220, 221–223, 225.
- Grand Avenue: 120, 116–130.

Also located within one mile of the project is the Scattergood Generating Station (SGS), operated by Los Angeles Department of Water and Power (LADWP). SGS is a 55-acre facility adjacent to the Pacific Ocean in Playa Del Rey. The existing three units at the plant are conventional steam turbine generators that burn natural gas in boiler units to produce steam and have a total gross capacity of 830 MW. Units 1 and 2 were constructed in 1958 and Unit 3 was constructed and began operation in 1974. Staff reviewed the evaluation completed for the Environmental Impact Report for the Scattergood Generating Station Unit 3 Repowering Project (Power 2011). That evaluation found that the1958 facility did not appear to meet any of the significance criteria for inclusion of the CRHR. The Scattergood station is located on Assessor's Parcel Number 4131029902, which is not subject to historic preservation review by the city of Los Angeles, indicating it is not a locally listed historic resource[26].

[26] Los Angeles maintains an online parcel viewer which lists many attributes of a parcel, including its historic category, if applicable. The online viewer is located at http://zimas.lacity.org/.

Staff did not receive a survey and evaluation of parcels bordering the project site from the petitioner, which includes portions of the Chevron El Segundo Refinery, which began operations in 1911(Maki 2005:4). Additionally, there are nine properties south of the project on 45th Street in Manhattan Beach within the one-parcel PAA which are 45 years or older. Built environment staff completed a windshield reconnaissance survey of those 45th Street properties on February 14, 2014 and determined that it is unlikely any of the historic-age properties are eligible as historic resources under CEQA. Staff is uncertain of the eligibility of the Chevron Refinery as staff investigation and the literature results produced only one report, Maki (2005), which did not address built-environment resources.

DIRECT/INDIRECT IMPACTS AND MITIGATION

In the abstract, direct impacts to cultural resources are those associated with project development, construction, and operation. Construction usually entails surface and subsurface disturbance of the ground, and direct impacts to archaeological resources may result from the immediate disturbance of the deposits, whether from vegetation removal, vehicle travel over the surface, earth-moving activities, excavation, or demolition of overlying structures. Construction can have direct impacts on historic standing structures when those structures must be removed to make way for new structures or when the vibrations of construction impair the stability of historic structures nearby. New structures can have direct impacts on historic structures when the new structures are stylistically incompatible with their neighbors and the setting, and when the new structures produce something harmful to the materials or structural integrity of the historic structures, such as emissions or vibrations.

Generally speaking, indirect impacts to archaeological resources are those which may result from increased erosion due to site clearance and preparation, or from inadvertent damage or outright vandalism to exposed resource components due to improved accessibility. Similarly, historic structures can suffer indirect impacts when project construction creates improved accessibility and vandalism or greater weather exposure becomes possible.

Ground disturbance accompanying construction at a proposed plant site has the potential to directly affect archaeological resources, unidentified at this time. The potential direct, physical impacts of the proposed construction on unknown archaeological resources are commensurate with the extent of ground disturbance entailed in the particular mode of construction. This varies with each component of the proposed project. Placing the proposed plant into this particular setting could have a direct impact on the integrity of association, setting, and feeling of nearby standing historic structures.

Construction Impacts and Mitigation

Identification and Assessment of Direct Impacts on Archaeological Resources and Proposed Mitigation

Archaeological Resources on the Surface of the PAA

No archaeological resources have been identified on the surface of the PAA. Staff concludes that appropriate methods were employed to identify archaeological resources on the ground surface and therefore construction and operation of the proposed project would not result in direct impacts on this class of cultural resource.

Buried Archaeological Resources in the PAA

As shown in **Cultural Resources Tables 5–6** and summarized in White et al. (2014), direct and indirect evidence has been found that buried prehistoric and historic archaeological resources are likely to be encountered during construction of the proposed ESPFM. In the case of prehistoric archaeological resources, the evidence is indirect; two prehistoric archaeological sites (P-19-002345 and P-19-004353) have been identified near the project site under Holocene-aged dune sands such as existed on the proposed project site prior to power plant development (**Cultural Resources Table 6**). In addition, archaeological and Native American monitors have identified numerous buried historic artifacts in the PAA and project site as a whole. Within the PAA, monitors recorded twenty historic-period artifacts, while a total of 35 buried, historic-period artifacts have been identified across the project site as a whole—inclusive of the PAA. Remnants of a historic railroad alignment might be present in the PAA, as indicated by the identification of a buried railroad tie on the project site, as well as historic records of the Pacific Electric Railroad's one-time presence along the western edge of the project site. (EDR 2000a, 2000b; GLO 1875; USGS 1896; White et al. 2008:Figures 2–3.). (White et al. 2014:15–26.) **Cultural Resources Table 2** demonstrates that six proposed project components would involve excavation into areas with unknown fill depths or would extend below the fill and disturb native soils and sediments. These project components consist of building the proposed access road, operations and maintenance building, natural gas compression station/fuel gas compressor building, forwarding pump, and new power plant units, as well as demolition of existing Units 3–4 and removal and remediation of the ESEC retention basins.

Based on the presence of buried prehistoric archaeological sites in very similar geomorphic contexts and near the project vicinity, and the historic archaeological finds made on the project site and PAA, staff concludes that further archaeological discoveries can be expected during construction of the proposed ESPFM. Excavation associated with demolition of Units 3–4, removal and remediation of the ESEC retention basins, and construction of the proposed access road, operations and maintenance building, natural gas compression station/fuel gas compressor building, forwarding pump, and new power plant units could damage or destroy archaeological resources present in the PAA. Damage or destruction would be a significant impact under CEQA, should affected archaeological resources qualify as historical resources or unique archaeological resources under CEQA and their historical significance materially impaired (Pub. Resources Code, § 21083.2[a]; Cal. Code Regs., tit. 14, § 15064.5[b]).

Staff proposes Conditions of Certification **CUL-1** through **CUL-7** to reduce these potential impacts to a less-than-significant level.

Identification and Assessment of Direct Impacts on Ethnographic Resources

No ethnographic resources have been identified in the PAA. The proposed project site has a slight potential to contain buried ethnographic resources, although these would most likely constitute archaeological resources. While earth-moving could result in significant impacts on ethnographic resources (should any be encountered), proposed Conditions **CUL-1** through **CUL-7** would reduce these potential impacts to a less-than-significant level.

Identification and Assessment of Direct Impacts on Built Environment Resources and Proposed Mitigation

Built environment technical staff has reviewed the literature search materials, other available studies as noted herein and performed on-site and off-site reconnaissance surveys. Based on the information available, staff concludes that the proposed petition to amend the ESEC license would have no direct impacts on known built environment historic resources. Therefore, staff is not recommending any mitigation measures.

Indirect Impacts

Staff has reviewed the literature search materials, other available studies as noted herein and performed on-site and off-site reconnaissance surveys. Based on the information available, staff concludes that the PTA would have no indirect impacts on known cultural resources. Therefore, staff does not recommend any mitigation measures for indirect impacts.

Operation Impacts and Mitigation

Staff has reviewed the literature search materials, other available studies as noted herein and performed on-site and off-site reconnaissance surveys. Based on the information available, staff concludes that the PTA would have no direct or indirect impacts on known cultural resources during operation. Therefore, staff does not recommend any mitigation measures for power plant operations.

Environmental Justice Impacts

Staff has not identified historical or unique archaeological resources in the PAA that are culturally important to identified environmental justice populations. As stated in the "Environmental Justice/Socioeconomic Methods" of this FSA section, staff has not identified a Native American environmental justice population residing in or using the PAA. Staff concludes that the proposed amendment would not result in environmental justice impacts due to effects on cultural resources.

Cumulative Impacts and Mitigation

A project may result in a significant adverse cumulative impact where its effects are cumulatively considerable. "Cumulatively considerable" means that the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future

projects (Cal. Code Regs., tit. 14, § 15130). Cumulative impacts to cultural resources in the project vicinity could occur if any other existing or proposed projects, in conjunction with the proposed ESPFM, had or would have impacts on cultural resources that, considered together, would be significant. The previous ground disturbance from prior projects and the ground disturbance related to construction of the proposed ESEC and other proposed projects in the vicinity could have a cumulatively considerable effect on subsurface archaeological deposits, both prehistoric and historic. The alteration of the setting which could be caused by the construction and operation of the proposed ESPFM and other proposed projects in the vicinity could be cumulatively considerable, but may or may not be a significant impact to cultural resources. No ethnographic resources were identified in the PAA, and therefore there is no potential for the proposed amendment to have a cumulatively considerable effect on ethnographic resources. The following two sections provide cumulative impact analyses for archaeological and built environment resources.

Cumulative Archaeological Impacts and Mitigation

For the purposes of this cumulative impacts analysis, staff has determined that the cumulative area of analysis for archaeological resources comprises a 6-mile-diameter semicircle from the project site. This area extends north–south from Marina Del Rey to the cities of Redondo Beach and Torrance, and eastward from the coast to the Rosecrans Hills (**Cumulative Impacts Figure 1**). The cumulative projects area of analysis encompasses all potential construction laydown/parking areas proposed by the project owner as well as geographic qualities that were likely of concern to the prehistoric inhabitants of the project vicinity. Archaeological research indicates that prehistoric settlement patterns changed over time. In the project vicinity, settlement pattern shifts are best documented at the Ballona Wetlands (Marina Del Rey), where ancient California Indians initially settled the bluffs (El Segundo Sandhills) above the Ballona estuary, obtained resources from the estuary, then returned to bluff-top settlements. Later in prehistory, Indian groups began to inhabit the estuary itself for more extended periods, albeit still seasonally. (Grenda and Altschul 1994:222–223.) Archaeological research elsewhere in the Los Angeles Basin suggests that the El Segundo vicinity hosted one or more major village sites from which people moved inland to gather resources as far away as the Rosecrans and Baldwin hills, 5–6 miles east of the project site (Hudson 1971:60–61, Map 2; cf. Grenda and Altschul 1994:Figure 1). Doubtlessly, California Indians forayed much further in all directions for resource procurement, socializing, and trading, but day-to-day activities of a settlement would have occurred nearby, over more limited distances. A 6-mile semicircle from the project site therefore appears to form a geographic unit that was probably meaningful to the prehistoric human inhabitants of the project vicinity, and a useful basis for assessing cumulative impacts on archaeological resources. In selecting projects that could contribute to cumulative impacts, staff identified those projects in the 6-mile radius that would result in ground disturbance because excavation is the primary vehicle for archaeological resource impacts for the proposed project. Staff presents its list of cumulative projects for archaeological resources in **Cultural Resources Table 9**. Cumulative projects were identified by consulting planning staff and websites for the municipalities in the 6-mile radius: County of Los Angeles; community of Marina Del Rey; and the cities of El Segundo, Manhattan Beach, Hermosa Beach, Redondo Beach, Los Angeles, Inglewood, Hawthorne, Lawndale, Gardena, and Torrance. In many

instances, copies of environmental review documents were not available online for staff's perusal; such projects are listed as yielding "No information" in the Resources Affected/Level of Significance column of **Cultural Resources Table 9**.

Cultural Resources Table 9
Summary of Cumulative Projects—Archaeological Resources

Project Title	Number on Figure[1]	Location	Project Description	Resources Affected/Level of Significance	References
Projects Referenced with a Point					
Chevron Coke Drum Project	2	324 West El Segundo Blvd., El Segundo	Removal of six existing coke drums and installation of six new coke drums with the same capacity and location in the Delayed Coker Unit.	None/LTS	Environmental Audit 2011:2-19–2-21
Chevron Central Reliability Center, EA-974	3	324 West El Segundo Blvd., El Segundo	Central tool room. New: 101,000 sq. ft.; existing to remain: 13,000 sf; new total is 114,000 sf.	None/LTS	RBF 2013a: Section 4.5
Scattergood Generating Station (SGS)	4	12700 Vista Del Mar, Los Angeles	Construct four power-generating units at SGS. Some structures would be demolished. Build two new full-size units on the plant.	None/LTS	Power 2011:26
EA-1020	5	138 Eucalyptus Dr., El Segundo	New 5,127 sf office/research and development building.	None/CE	Planning Commission 2013a:2
EA-961	6	130 Arena St., El Segundo	386-sf office and 3019-sf warehouse.	No information found	
EA-1004	7	134 Penn St., El Segundo	Two new creative office and research and development buildings: 1,297-sf office, 7,803-sf research and development, 1,194-sf warehouse, total 10,294 sf	None/CE	Planning Commission 2012a:3
EA-1003	8	130 Penn St., El Segundo	Two new creative office and research and development buildings: 1,297-sf office, 7,803-sf research and development, 1,194-sf, total 10,294 sf.	None/CE	Planning Commission 2012b:2
EA-781	9	301–305 W. Palm Ave., El Segundo	7-Unit residential condominium, 14,313 sf.	None/CE	Planning Department 2009:1
EA-1038	10	711 Main St., El Segundo	4-unit condominium (6,963 sf), semi-subterranean parking.	None/CE	Planning Department 2013a:1
EA-1014	11	115 East Walnut Ave.,	2-lot subdivision for two 6-unit multi-family	None/CE	Planning Department

Project Title	Number on Figure[1]	Location	Project Description	Resources Affected/Level of Significance	References
		El Segundo	residential condos.		2013b:1
EA-959	12	222 Kansas St., El Segundo	Two office buildings, 30,660 sf.	None/LTSWM	PBS&J 2008:50–53; Planning Department 2012:3
The Point, EA-993	13	820–850 S. Sepulveda Blvd., El Segundo	119,275 sf total: shopping center (71,343 sf), restaurant (25,627 sf), and office (27,338 sf).	P- 19-186856/LTSWM	CAJ&A 2004:IV.N-8–9; CAJ&A 2008:23–24; EcoTierra 2013:25
Civic Center/Metlox Development	14	Manhattan Beach	Demolish and rebuild the existing police and fire department facilities Build addition to public library or demolish and rebuild public library and cultural arts center. Build a mixed-use commercial development with subterranean and surface parking on the proposed 13th Street extension.	None/No impact	Atkins 2013a:3-22–23
El Segundo Unified School District, EA-890	15	540 E. Imperial Ave., El Segundo	Senior housing/assisted living facility.	None/LTS	Atkins 2013b:3-21–23
EA-958	16	1700 E Mariposa Ave., El Segundo	9 residential condo units.	None/CE	Planning Commission 2012b:1
Manhattan Village Shopping Center Enhancement Project	17	3200–3600 North Sepulveda Blvd., Manhattan Beach	Demolition, rebuild, and new build of retail, cinema, restaurant, and parking space.	None/LTS	Matrix 2009:1-7, B-9–12
Queen Esther Square Shopping Center (EA-912)	18	600–630 N. Sepulveda Blvd., El Segundo	New 3,714 sf restaurant with drive through, parking and landscaping redesign, outdoor dining.	None/LTS	RBF 2013b:4.5-1–4.5-2
Cambria Suites Hotel (EA-844)	19	199 Continental Blvd., El Segundo	152-room hotel (71,000 sf).	None/LTSWM	RBF 2010:6
Raytheon Campus Specific Plan (EA-905)	20	2100 El Segundo Blvd, El Segundo	2,142,457 sf office park expansion (office, retail, warehouse, light industrial).	None/LTS	RBF 2012a:4.5-1, 4.5-2
Mattel (EA-986)	21	455 Continental Blvd., 1955 E. Grand	Research and development and office, 14 stories, 300,000 sf, 810-space parking	None/No impact	PCR 2003b:142

Project Title	Number on Figure[1]	Location	Project Description	Resources Affected/Level of Significance	References
		Ave., El Segundo	structure-8-stories.		
Boeing S-50 Building Addition (EA-981)	22	1700 E. Imperial Ave., El Segundo	Office, 194,119 sf.	No information available	Planning Commis-sion 2012c:3–4
Hotel (EA-997)	23	888 N. Sepulveda Blvd., El Segundo	Five-story, 190 room hotel, 107,090 sf.	None/LTSWM	Atkins 2013c:49–52; Gillean and Sanka 2013
EA-996	24	2161 E. El Segundo Blvd., El Segundo	2800-sf convenience store.	None/CE	Planning Commission 2013b:2
Central Utility Plant Replacement	25	LAX	Replace the 50-year old existing Central Utility Plant.	Five archaeological resources/ LTSWM; cumulatively significant	Los Angeles 2004:4-836–839
New Tom Bradley International Terminal	25	LAX	18 new gates to the west side of the Tom Bradley International Terminal, great hall for dining and retail shopping.	None/LTSWM	Los Angeles 2009:5-51
Terminal 5 Renovation	25	LAX	Completed new security measures and international passenger processing facilities. Renovate baggage claim areas, ticketing/check-in lobby, boarding gates, and other parts of passenger security screening area. Replace 13 bridges.	None/CE	City Council 2011
LAX Curbside Appeal Project	25	LAX	Phase 1: New Canopy, landscaping, light band, and new light poles in front of Tom Bradley International Terminal; Phase 2: Light band, light poles, and canopies in front of the terminal in the LAX Central Terminal Area.	No information found	
Terminal 7 Improvement Project	25	LAX	Consolidate security screening check points, relocation and consolidation of the United Club lounges, relocation and consolidation of the mechanical systems, modification of ticketing	None/LTS	CDM Smith 2013:B-9–14

Project Title	Number on Figure[1]	Location	Project Description	Resources Affected/Level of Significance	References
			area, and relocation of support services.		
T5 Data Center Expansion Project (EA-971)	26	444 N Nash St., El Segundo	Data Center, addition of 75,435 sf, demolition of 11,769 sf; new total sf of 180,422.	None/LTS	RBF 2012b:4.5-1–2
West Aircraft Maintenance Area	27	LAX	Replace existing facilities and consolidate maintenance operations; paved area for aircraft parking, maintenance hangars, employee parking lot, storage, equipment related facilities, and ground run-up enclosure.	None/LTSWM	LAWA 2012b:3-13–14
Midfield Satellite Concourse North	27	LAX	Concourse for up to 11 gates and associated facilities; improvements to taxiways and taxilanes; ramp tower or supplemental airport traffic control tower; and utilities to support the North MSC facility.	None/LTSWM	LAWA 2013a:41–46; Sapphos 2013:5-21
LAX Runway 7L/25R Runway Safety Area (RSA) Project & Associated Improvements	27	LAX	Extend Runway 7L/25R pavement; grade and compact the RSA; construct blast pad; taxiway modifications as necessary; relocate existing Localizer Antenna and shelter; replace existing Approach Lighting System (ALS) towers with in-pavement lights; modify existing Runway and Taxiway lighting and markings in newly constructed pavements; reconstruct pavement of eastern portions of Runway 7L/25R and Taxiway B; reconstruct pavement of aircraft parking apron west of Air Freight Building No. 8.	None/LTSWM	LAWA 2013b:5-8–10
LAX Runway 6L-24R Safety Area & Associated Improvements	27	LAX	Improve Runway 6L-24R and service roads.	None/LTSWM	LAWA 2013c:42–46; Ricondo 2014:4-3
Wiseburn High School	28	201 N. Douglas St.,	New high school, 180,000 to 240,000 sf.	None/LTSWM	TCP|DC&E 2013:3-5

Project Title	Number on Figure[1]	Location	Project Description	Resources Affected/Level of Significance	References
		El Segundo			
Corporate Campus Specific Plan Amendment (EA-1021)	29	710 North Nash St., El Segundo	611,545 sf office, 12,660 sf retail, 625,205 sf total.	No information found	
EA-1040	30	400 Duley Rd., El Segundo	28,406 sf office, 33,475 sf light industrial, total 61,881 sf.	No information found	
Equinix Data Center (EA-784)	31	445 N. Douglas St., El Segundo	332,137-sf data center.	No information found	
EA-1001	32	2355 and 2383 Utah Ave., El Segundo	Creative office at 2355 Utah: Convert existing 42,548 sf to all office, add 1687 sf. At 2383 Utah: Convert existing 152,506 sf to all office, add 6850 sf.	No information found	
Marine Avenue Hotels Project	33	2410 and 2420 Marine Ave., Redondo Beach	Two hotels: Hyatt Place and Residence Inn by Marriott. Total between both hotels: 310 guest rooms and 35,000 sf of related meeting space .	None/LTS	Redondo 2010:6–7, 18–19
E&B Oil Development Project	34	555 6th Street, Hermosa Beach	Proposed onshore drilling and production site of 30 wells to access the oil and gas reserves in the tidelands and uplands. Relocate the city maintenance yard and install offsite underground pipelines for transport.	Hermosa Beach City Dump Site; brick furnace, City Maintenance Yard/LTSWM	MRS 2014:4.4-13–19
Redondo Beach Energy Project	35	Redondo Beach Generating Station, Redondo Beach	Natural gas fired air-cooled 496-megawatt electrical generating facility. Project would require demolition of existing power plant and construction of project.	Salt Lake, Engnovangna Village and Trail; inadvertent discoveries; RBGS/LTSWM	CEC 2014:4.4-69
Greenstreet Project	36	901 N. Catalina Ave, Redondo Beach	20,000-sf commercial development.	No information	
Shade Hotel	37	655 N. Harbor Drive, Redondo Beach	Hotel with 54 rooms, conference space for up to 60 people, event/wedding space for up to 150 people.	No information	
Parcel 44 Development	38	Mindanao and Admiralty	Demolition of all existing landside structures on Parcel 44 and	None/LTS	DRP 2013:19–20

Project Title	Number on Figure[1]	Location	Project Description	Resources Affected/Level of Significance	References
		ways, Marina Del Rey	redevelopment that includes 83,778 sf of commercial, office, retail, restaurant and boater-serving uses. Outdoor storage of up to 57 boats.		
ENV-2013-2713-MND	39	1635 S. Abbot Kinney Blvd, Los Angeles	Change in use of a 1,013-sf office and a 553-sf take-out restaurant into 1,566-sf restaurant with the expansion of an existing 1,390-sf sit-down restaurant, resulting in a 2,956-sf sit-down restaurant.	No information	
Crenshaw/LAX Transit Corridor Project	1 (line)	Crenshaw Corridor, Inglewood, Westchester and LAX area	An 8.5-mi light-rail line between existing Metro Exposition Line at Crenshaw & Exposition Blvds to Metro Green Line's Aviation/LAX Station. Includes eight stations, a maintenance facility, park-ride lots, traction power substations.	Archaeological site and historic park/LTSWM	FTA and LACMTA 2011a:4-206, 4-210, 5-66–67; FTA and LACMTA 2011b:3-88; FTA and LACMTA 2012:27–29
SR-1(PCH) at SR-107 Hawthorne Blvd Intersection Project	Not on figure	SR-1 at SR-107, Torrance	Add turn lanes, excavate into fill materials.	None/No impact	Bonterra 2013:31–33

1. Number given on **Cumulative Impacts Figure 1**.
Notes: Ave = avenue; Blvd = boulevard; CE = categorical exemption; CMB = city of Manhattan Beach; DIP = ductile iron pipe; Dr = drive; ft = feet; LAX = Los Angeles International Airport; LTS = less than significant; LTSWM = less than significant with mitigation; mi = miles; Rd = road; sf = square feet; SGS = Scattergood Generating Station; SR = State Route; St = street

Staff identified a total of 46 cumulative projects in the 6-mile radius. Staff was unable to locate environmental impact reviews for 10 of the projects summarized in **Cultural Resources Table 9**. A total of 12 cumulative projects reportedly would result in no impacts on archaeological resources, although local agencies determined that eight of these projects fell under categorical exemptions; documentation supporting the exemptions was not available online. Eleven of 41 cumulative projects report less-than-significant impacts on archaeological resources because none were identified in their respective impact areas. Twelve cumulative projects would result in less-than-significant impacts on archaeological resources with the implementation of mitigation measures; four of these projects would affect known archaeological resources. (**Cultural Resources Table 9**.) The Central Utility Plant Replacement Project at LAX would result in impacts on five archaeological resources. Although these impacts would be reduced

to a less-than-significant level through mitigation measures, the cumulative loss of archaeological resources in the project vicinity was found to be significant. (Los Angeles 2004:4-836–839.) Although staff concludes that the proposed ESPFM could result in significant impacts on archaeological resources that qualify as either historical or unique archaeological resources (as defined under CEQA), staff-proposed Conditions of Certification **CUL-1** through **CUL-7** would reduce project-specific impacts to a less-than-significant level. Therefore, the proposed project's contribution to cumulative impacts on archeological resources would be less than cumulatively considerable.

Cumulative Built Environment Impacts and Mitigation

For cumulative impacts to the built environment, staff has used both the one-mile PAA used for the literature search and an overlay from Long Beach to Los Angeles taking into account the numerous former SCE generating stations built with once-through cooling technology in the post-war boom of the 1950s to 1970s and located at the southern California coast. The literature search results for the PAA yielded several environmental reports within the cumulative impacts area. Built environment technical staff has reviewed the literature search materials and other available studies and performed on-site and off-site reconnaissance surveys. In order to be as conservative and inclusive as possible, the projects included in this cumulative analysis include project sites with historic-age buildings, regardless of whether or not an eligibility determination was made.

Considered in conjunction with the potential removal and reconstruction of other Southern California steam-generating plants from the 1950s to 1970s, such as Huntington Beach Generating Station (HBGS), Alamitos Generating Station (AGS), and Redondo Beach Generating Station (RBGS), the loss of the El Segundo facility has the potential to add to the loss of information relative to the development of electric steam power generation in the mid- twentieth century in California. However, all of these post-war power plants have been recorded and evaluated at a basic level, and through the licensing process, that historical information has been made available to the public. Due to the existence of this recorded historical information, the likelihood of there being a cumulative impact from the proposed ESPFM is negligible.

Demolition of the Edison Plant, which staff concludes is not an historical resource under CEQA, does not add to the cumulative effects of other built environment projects in the PAA or the built environment cumulative overlay. Therefore, staff is not recommending any mitigation measures.

COMPLIANCE WITH LORS

Staff concludes that the proposed project would comply with the LORS listed in **Cultural Resources Table 1**. Staff's conclusions of LORS compliance are provided in **Cultural Resources Table 10**. To summarize applicable LORS, state laws stipulate specific courses of action and notifications in the event that human remains and grave- or cairn-associated artifacts are found during construction (see **Cultural Resources Table 10**, Pub. Resources Code, §§5097.98[b] and [e], 5097.99; Health and Safety Code, §7050.5). Staff's proposed conditions **CUL-3** and **CUL-5** would ensure compliance with these laws through the preparation of a Cultural Resources Mitigation and Monitoring

Plan (CRMMP) and implementation of a Workers' Environmental Awareness Program (WEAP). city of El Segundo's Local Coastal Program requires that development impacts on cultural resources are mitigated; staff proposes **CUL-1** through **CUL-7** as a comprehensive cultural resources mitigation and monitoring program.

While both Manhattan Beach and El Segundo have regulations regarding the treatment of historic landmarks and structures, none of the LORS apply to the built environment aspects of the proposed Petition to Amend the ESEC as there are no impacts to historic built environment resources. None of the LORS in Los Angeles County or the cities of Gardena and Los Angeles are likewise applicable as the project is not proposing any changes to the proposed construction parking areas that would result in potential impacts to historic built environment resources.

Cultural Resources Table 10
Compliance with Laws, Ordinances, Regulations, and Standards

Applicable Law	Description	Condition of Certification Demonstrating Compliance
State		
Pub. Resources Code, §§ 5097.98 (b and e)	Requires a landowner on whose property Native American human remains are found to limit further development activity in the vicinity until s/he confers with the Native American Heritage Commission (NAHC)-identified Most Likely Descendents (MLDs) to consider treatment options. In the absence of MLDs or of a treatment acceptable to all parties, the landowner is required to reinter the remains elsewhere on the property in a location not subject to further disturbance.	**CUL-3** requires the preparation of a Cultural Resources Mitigation and Monitoring Plan (CRMMP), which would describe the response and notification procedures described in these sections of the Public Resources Code. **CUL-5**, the Workers' Environmental Awareness Program (WEAP), would inform construction staff of the legal response to discovery of Native American human remains and artifacts.
Pub. Resources Code, § 5097.99	§5097.99 prohibits the acquisition, possession, sale, or dissection with malice or wantonness of Native American remains or artifacts taken from a Native American grave or cairn.	**CUL-3** requires the preparation of a CRMMP, which would contain provisions for the disposition of Native American remains or artifacts. **CUL-5**, the WEAP, would inform construction staff of the legal response to Native American human remains and artifacts.
Health and Safety Code, § 7050.5	This code makes it a misdemeanor to disturb or remove human remains found outside a cemetery. It also requires a project owner to halt construction if human remains are discovered and to contact the county coroner.	**CUL-3** requires the preparation of a CRMMP, which would describe the response and notification procedures described in this section of the Health and Safety Code. Construction staff would be instructed in these matters during the WEAP required by **CUL-5**.
Local		
city of El Segundo Local Coastal	The issues identification report of the LCP states that development impacts on archaeological and paleontological resources shall be mitigated. (El	Staff proposes **CUL-1** through **CUL-7** as a comprehensive mitigation and monitoring program.

Applicable Law	Description	Condition of Certification Demonstrating Compliance
Program (LCP)	Segundo 1980.)	
city of El Segundo Title 15; Chapter 14 Municipal Code	The purpose of this Chapter is to promote the public health, safety and general welfare by providing for the identification, protection, enhancement, perpetuation and use of historic buildings and structures within the City that reflect special elements of the City's historical heritage.	Staff concludes that the ESEC is not eligible for listing on the CRHR. Staff has not identified any impacts to significant historic buildings or structures. No conditions of certification are necessary for compliance.

CONCLUSIONS AND RECOMMENDATIONS

Staff concludes that the proposed amendment would not result in significant impacts on known cultural resources that meet CEQA's definitions of historical or unique archaeological resources. Through past project site-specific cultural resources monitoring reports, staff finds that the proposed amendment has demonstrated potential to result in inadvertent discoveries of cultural resources in specific portions of the PAA. Such impacts would be significant, should construction-related impacts damage a significant cultural resource and to the extent that its ability to convey its significance is materially impaired. Staff proposes conditions of certification to reduce the severity of these impacts.

Staff concurs with the conclusions provided by the petitioner that the ESEC is not eligible for listing on the NRHP or the CRHR for the reasons given in the evaluation (JRP 2013; LL 2013) and based upon staff's independent analysis. Based upon this conclusion, there will be no impacts to historic built environment resources. Therefore, no mitigation is proposed.

The following subsection of the FSA, "Conditions of Certification from the Current License", presents the suite of cultural resources mitigation measures adopted by the Energy Commission in its Final Decision for the ESEC. With the exception of **CUL-6**, staff recommends the cultural resources conditions from the current license without modifications. **CUL-1** and **CUL-2** are administrative conditions that set out who the people are who will implement the balance of the conditions, what the qualifications and roles of those people will be, and the information that the project owner will supply them to help them fulfill those roles. **CUL-3** requires the project owner to provide a specific plan (Cultural Resources Mitigation and Monitoring Plan, or CRMMP) to guide construction monitoring and the evaluation and treatment of inadvertently discovered archaeological resources or human remains, in light of what is known about regional prehistoric, ethnography, and history. **CUL-5** provides for training of project owner staff and the construction management/implementation team regarding basic cultural resource identification and compliance with these proposed conditions and the provisions of the CRMMP. **CUL-6** defines the scope of monitoring by qualified archaeologists and Native Americans, required to implement the CRMMP and other proposed Conditions. Staff narrows the scope of **CUL-6** to those excavation activities

that staff identifies as requiring excavation into non-fill sediments, per **Cultural Resources Table 2**. **CUL-7** defines the protocols, responsibilities, and timeframes involved in responding to inadvertent archaeological or human remains discoveries. **CUL-8**, which describes the manner in which the project owner and the Compliance Project Manager (CPM) are to conduct cultural resources inventory and analysis in the event that the water pipeline proposed under the original ESEC proceeding was realigned to a different route, has been satisfied during previous project construction and is not relevant to the present amendment. **CUL-4** requires that the project owner prepare a final report of all cultural resources activities undertaken during construction of the proposed project and the Energy Commission's responsibility as lead agency to review this document to verify accuracy and complete implementation of the cultural resources mitigation and monitoring program.

CONDITIONS OF CERTIFICATION FROM THE CURRENT LICENSE

Staff has proposed modifications to the Cultural Resources Conditions of Certification as shown below. (Note: Deleted text is in ~~strikethrough~~, new text is **bold and underlined**.)

DESIGNATED CULTURAL RESOURCES SPECIALIST

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 Compliance Project Manager (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 at 36 C.F.R., 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

c. 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: The project owner shall submit the resume for the CRS at least 45 days prior to the start of ground disturbance. At least 10 days prior to a termination or release of the CRS, the project owner shall submit the resume of the proposed replacement CRS. 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.

PROJECT MAPS SHOWING GROUND DISTURBANCE

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

Verification: The project owner shall submit the subject maps and drawings at least 40 days prior to the start of ground disturbance.

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. If project construction is phased, the project owner shall submit the subject maps and drawings 15 days prior to each phase.

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.

CULTURAL RESOURCES MONITORING AND MITIGATION PLAN

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, supersede 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, Code of Federal 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 ARMR 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).

CULTURAL RESOURCES REPORT

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.

WORKER ENVIRONMENTAL AWARENESS PROGRAM

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.

CULTURAL RESOURCES MONITORING

CUL-6 The CRS, alternate CRS, or monitors shall monitor ground disturbance full time in the vicinity of the project site, linear facilities 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. **Monitoring shall be conducted in those areas identified in Cultural Resources Table 2 of the FSA as involving excavation into non-fill sediments.** In the event that the CRS determines that full-time monitoring is not necessary in certain locations, a letter or e-mail 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. 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.

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

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.

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.

DESIGNATED CULTURAL RESOURCE SPECIALIST AUTHORITY

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.

~~WATER PIPELINE REALIGNMENT~~

~~**CUL-8** The route for the water lines shall extend down Grand Avenue to Eucalyptus St. to El Segundo Blvd, which is within the water pipeline study area, bordered by El Segundo Blvd., Loma Vista St., Grand Ave. and Eucalyptus St. (Project owner has conducted a cultural resources assessment in the pipeline study area and within the area defined as the proposed project). 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. This approach 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.

CULTURAL RESOURCES ACRONYM GLOSSARY

AGS	Alamitos Generating Station
ARMR	Archaeological Resource Management Report
asl	above sea level
B.P.	before present (1950)
CA	California
CAJ&A	Christopher A. Joseph & Associates
cal	calibrated (years B.P.)
Cal. Code Regs.	California Code of Regulations
CEC	California Energy Commission
CEQ	Council on Environmental Quality
CEQA	California Environmental Quality Act
C.F.R.	Code of Federal Regulations
CHRIS	California Historical Resources Information System
Conditions	Conditions of Certification
CPM	Compliance Project Manager
CRHR	California Register of Historical Resources
CRM	Cultural Resources Monitor
CRMMP	Cultural Resources Monitoring and Mitigation Plan
CRR	Cultural Resource Report
CRS	Cultural Resources Specialist
DPR 523	Department of Parks and Recreation (cultural resources recordation form)
DRP	Department of Regional Planning (County of Los Angeles)
EDR	Environmental Data Resources, Inc.
E.O.	Executive Order
ESEC	El Segundo Energy Center

ESGS El Segundo Generating Station

ESP El Segundo Power II

ESPFM El Segundo Power Facility Modification

ESPR El Segundo Power Redevelopment Project

FAA Federal Aviation Administration

FSA Final Staff Assessment

FTA Federal Transit Administration

GLO General Land Office

HBGS Huntington Beach Generating Station

JRP JRP Historical Consulting

LA Los Angeles County

LADWP Los Angeles Department of Water and Power

LAHCM Los Angeles Historic-Cultural Monument

LAN Los Angeles County

LAWA Los Angeles World Airports

LCP local coastal program

LL Locke Lord

LORS laws, ordinances, regulations, and standards

LTSWM less than significant with mitigation measures

MCR Monthly Compliance Report

MLD Most Likely Descendent

MRS Marine Research Specialists

LACMTA Los Angeles County Metropolitan Transportation Authority

NAHC Native American Heritage Commission

NHPA National Historic Preservation Act

NPS National Park Service

NRHP National Register of Historic Places

OHP Office of Historic Preservation

OR Orange County

PAA Project Area of Analysis

PCR PCR Services Corporation

PTA Petition to Amend

Pub. Resources Code Public Resources Code (State of California)

R Range

RBGS Redondo Beach Generating Station

S South

SAIC Science Applications International Corporation

SBA Santa Barbara County

SCCIC South Central Coastal Information Center

SCE Southern California Edison/Southern California Edison Company

SGS Scattergood Generating Station

SHPO State Historic Preservation Officer

SMI San Miguel Island

SR State Route

SRI Santa Rosa Island

Staff Energy Commission cultural resources technical staff

SWCA SWCA Environmental Consultants

T Township No.

U.S.C. United States Code

USGS U.S. Geological Survey

VN Ventura County

W West

WEAP Worker Environmental Awareness Program

REFERENCES

The *tn: 00000* in a reference below indicates the transaction number under which the item is catalogued in the Energy Commission's Docket Unit. The transaction number allows for quicker location and retrieval of individual items docketed for a case or used for ease of reference and retrieval of exhibits cited in briefs and used at Evidentiary Hearings.

Altschul et al. 2005—Jeffrey H. Altschul, Richard Ciolek-Torrello, Donn R. Grenda, Jeffrey A. Homburg, Su Benaron, and Anne Q. Stoll. Ballona Archaeology: A Decade of Multidisciplinary Research. *Proceedings of the Society for California Archaeology* 18:283–301.

Altschul et al. 2007—Jeffrey H. Altschul, John G. Douglass, Richard Ciolek-Torrello, Sarah Van Galder, Benjamin R. Vargas, Kathleen L. Hull, Donn R. Grenda, Jeffrey Homburg, Manuel Palacios-Fest, Steven Shelley, Angela Keller, and David Maxwell. Life at the Nexus of the Wetlands and Coastal Prairie, West Los Angeles. *Proceedings of the Society for California Archaeology* 20:34–42.

Amaglio 2012—Alessandro Amaglio. *Seismic Retrofit, Gardena Senior High School, Los Angeles Unified School District*. Region IX, Federal Emergency Management Administration. On file, South Central Coastal Information Center, California Historical Resources Information System, Fullerton. Study LA-11716.

Andrus 2002—Patrick W. Andrus. *National Register Bulletin: How to Apply the National Register Criteria for Evaluation*. Revised for internet, edited by Rebecca H. Shrimpton. Washington, D.C.: National Park Service, U.S. Department of the Interior. Electronic document, http://www.nps.gov/history/nr/publications/bulletins/nrb15/, accessed January 24, 2014.

Atkins 2013a—Atkins. *Addendum to the Civic Center/Metlox Development Environmental Impact Report*. February. Los Angeles. Prepared for Department of Public Works, County of Los Angeles, CA. SCH # 99121090.

Atkins 2013b—Atkins. *Addendum to the Civic Center/Metlox Development Environmental Impact Report*. February. Los Angeles. Prepared for Department of Public Works, County of Los Angeles, Alhambra, CA. SCH No. 99121090. Electronic document, http://file.lacounty.gov/bos/supdocs/74866.pdf, accessed June 30, 2014.

Atkins 2013c—Atkins. *city of El Segundo, 888 North Sepulveda Boulevard Specific Plan Project Initial Study/Mitigated Negative Declaration*. Draft. December. Los Angeles. Prepared for Planning and Building and Safety Department, city of El Segundo, CA. Environmental Assessment No. 997; General Plan Amendment 12-03; Zone Change 12-03; Zone Text Amendment 12-05; Specific Plan 12-05; Conditional Use Permit 12-08; Development Agreement 12-04; Subdivision 12-07; and Parking Demand Study 12-06. Electronic document,

http://www.elsegundo.org/civicax/filebank/blobdload.aspx?BlobID=11379, accessed July 9, 2014.

Barre 2005—Ole Barre. *Proposed Federal Aviation Administration (FAA) Airport Surface Detection Equipment, Model X (ASDE-3X) to Serve Los Angeles International Airport (LAX), Los Angeles, CA—Case #FAA040625A*. October 14. SRI International, Menlo Park, CA. Submitted to Office of Historic Preservation, Sacramento, CA. On file, South Central Coastal Information Center, California Historical Resources Information System, Fullerton. Study LA-11561.

Bass 2000—Bryon Bass. DPR 523 Record Forms for H. Kramer Company Foundry (P-19-186856). November 29. URS Corporation, Oakland, CA. On file, South Central Coastal Information Center, California Historical Resources Information System, Fullerton.

Bean and Smith 1978—Lowell J. Bean and Charles R. Smith. *Gabrielino*. In California, edited by Robert F. Heizer, pp. 538–549. Handbook of North American Indians, Vol. 8, William C. Sturtevant, general editor. Washington D.C.: Smithsonian Institution.

Bechtel 1953—Bechtel Corporation. Vicinity Plan. August 11. Job No. 2080.

Bissell 1995a—Ron Bissell. Archaeological Site Record Supplement for CA-LAN-202 [P-19-000202]. July 28. RMW Paleo Associates, Mission Viejo, CA. On file, South Central Coastal Information Center, California Historical Resources Information System, Fullerton.

Bissell 1995b—Ron Bissell. Archaeological Site Record for CA-LAN-*3 [CA-LAN-202/P-19-000202]. July 28. RMW Paleo Associates, Mission Viejo, CA. On file, South Central Coastal Information Center, California Historical Resources Information System, Fullerton.

Bissell 1995c—Ron Bissell. Archaeological Site Record for CA-LAN-*1H [CA-LAN-2385/P-19-002385]. July 28. RMW Paleo Associates, Mission Viejo, CA. On file, South Central Coastal Information Center, California Historical Resources Information System, Fullerton.

Bissell 1995d—Ron Bissell. Archaeological Site Record for CA-LAN-*2H [CA-LAN-2386H/P-19-002386]. July 28. RMW Paleo Associates, Mission Viejo, CA. On file, South Central Coastal Information Center, California Historical Resources Information System, Fullerton.

Bissell 1995e—Ron Bissell. Archaeological Site Record for Isolate 1 [P-19-100115]. July 14. RMW Paleo Associates, Mission Viejo, CA. On file, South Central Coastal Information Center, California Historical Resources Information System, Fullerton.

Bissell 1995f—Ron Bissell. Archaeological Site Record for Isolate 2 [P-19-100116]. July 27. RMW Paleo Associates, Mission Viejo, CA. On file, South Central Coastal Information Center, California Historical Resources Information System, Fullerton.

Bolin 2001—David P. Bolin. Proposed AT&T Wireless Telecommunication Equipment Installation 1601 West 190th Street, Gardena, California 90248, Site Id Number: c796-405 Western Avenue. GeoTrans. Project No. I260-680. On file, South Central Coastal Information Center, California Historical Resources Information System, Fullerton. Study LA-06875.

Bonner 2000—Wayne H. Bonner. Records Search Results for Sprint Pcs Facility La38xc74d (the El Segundo Site), Located at 1901 South Hughes Way in El Segundo, Los Angeles County, California. Michael Brandman Associates. On file, South Central Coastal Information Center, California Historical Resources Information System, Fullerton. Study LA-06903.

Bonner 2005—Wayne H. Bonner. Cultural Resources Records Search Results and Site Visit for Sprint Candidate La70xc314d (el Porto Building), 312 Rosecrans Avenue, Manhattan Beach, Los Angeles County, California. Michael Brandman Associates. On file, South Central Coastal Information Center, California Historical Resources Information System, Fullerton. Study LA-07716.

Bonner 2008—Wayne H. Bonner. Letter Regarding Cultural Resources Records Search and Site Visit Results for Sprint Nextel Candidate LA73XC302B (El Segundo Data Display Productes), 445 South Douglas Street, El Segundo, Los Angeles County, California. April 15. Michael Brandman Associates, Irvine, CA. Prepared for SRES, Santa Ana, CA. On file, South Central Coastal Information Center, California Historical Resources Information System, Fullerton. Study LA-09924.

Bonner 2011a—Wayne H. Bonner. Letter Regarding Cultural Resources Records Search and Site Visit Results for: T-Moblle-USA Candldate 4A74000-A (SCE Top Secret at NRG), 301 Vista Del Mar, El Segundo, Los Angeles County, California. September 7. Michael Brandman Associates, Irvine, CA. Prepared for Environmental Assessment Specialists, Mission Hills, CA, On file, South Central Coastal Information Center, California Historical Resources Information System, Fullerton. Study LA-11638.

Bonner 2011b—Wayne Bonner. Letter Regarding Cultural Resources Records Search and Site Visit Results for T-Mobile USA Candidate LA74000-A (SCE Top Secret at NRG), 301 Vista Del Mar, El Segundo, Los Angeles County, California. September 7. Michael Brandman Associates, Irvine, CA. Prepared for Environmental Assessment Specialists, Mission Hills, CA. On file, South Central Coastal Information Center, California Historical Resources Information System, Fullerton. Study LA-11638.

Bonner 2012a—Wayne H. Bonner. Letter Regarding Cultural Resources Records Search and Site Visit Results for T-Mobile West, LLC Candidate LA74000-B (N.R.G. El Segundo), 301 Vista del Mar Boulevard, El Segundo, Los Angeles, California. August 15. Michael Brandman Associates, Irvine, CA. Prepared for Environmental Assessment Specialists, Mission Hills, CA, On file, South Central Coastal Information Center, California Historical Resources Information System, Fullerton. Study LA-11971.

Bonner 2012b—Wayne Bonner. Letter Regarding Cultural Resources Records Search and Site Visit Results for T-Mobile West, LLC Candidate LA02942A (LA943 Douglas Family), 500 East Imperial Avenue, El Segundo, Los Angeles County, California. Michael Brandman Associates, Irvine, CA. On file, South Central Coastal Information Center, California Historical Resources Information System, Fullerton. Study LA-12079.

Bonner and Crawford 2007—Wayne H. Bonner and Kathleen A. Crawford. Cultural Resources Records Search and Site Vicit Results for T-Mobile Candidate le04861e (Nouri Rugs), 634 East Colorado Boulevard, Pasadena, Los Angeles County, California. Michael Brandman Associates. On file, South Central Coastal Information Center, California Historical Resources Information System, Fullerton. Study LA-08813.

Bonner and Crawford 2012—Wayne H. Bonner and Kathleen A. Crawford. Letter Regarding Cultural Resources Records Search and Site Visit Results for AT&T Mobility, LLC Facility LAR013 (LAR013-01 El Segundo/SCE), CASPR No. 3551278808, 301 Vista Del Mar, El Segundo, Los Angeles County, California. February 24. Prepared for Environmental Assessment Specialists, Mission Hills, CA, On file, South Central Coastal Information Center, California Historical Resources Information System, Fullerton. Study LA-12078.

Bonterra 2013—Bonterra Consulting. *Draft Initial Study Checklist for SR-1(Pacific Coast Highway) at SR-107 Hawthorne Boulevard Intersection Project, city of Torrance*. October. Irvine, CA. Prepared for Public Works Department, city of Torrance, CA. Electronic document, http://www.torranceca.gov/Documents/Hawthorne_Boulevard_Draft_IS_Checklist_-_October_2013.pdf, accessed July 16, 2014.

Brian F. Smith and Associates 2005—Brian F. Smith and Associates. *LAX Master Plan Mitigation Monitoring & Reporting Program – Archaeological Treatment Plan*. Final. December. San Diego, CA. Prepared for Earth Tech, Irvine, CA. Submitted to Western Region, Federal Aviation Administration, and Environmental Management Division, Los Angeles World Airports. On file, South Central Coastal Information Center, California Historical Resources Information System, Fullerton. Study LA-10857.

Bucknam 1974—Bonnie M. Bucknam. *The Los Angeles Basin and Vicinity: A Gazetteer and Compilation of Archaeological Site Information*. May. California State University, Long Beach. On file, South Central Coastal Information Center, California Historical Resources Information System, Fullerton. Study LA-03583/OR-04034/VN-02983.

Bunse and Mikesell 2000—Meta Bunse and Stephen D. Mikesell. *Historic Evaluation of the El Segundo Generating Station, El Segundo, Los Angeles County, California*. October. JRP Historical Consulting Services, Davis, CA. Prepared for URS Corporation, Oakland, CA. On file, South Central Coastal Information Center, California Historical Resources Information System, Fullerton. Study LA-06240.

Burnham and Romoli 1965—Burnham and Romoli. Archaeological Site Survey Record for CA-LAN-47. On file, South Central Coastal Information Center, California Historical Resources Information System, Fullerton.

CAJ&A 2004—Christopher A. Joseph & Associates. *Draft Environmental Impact Report for the Sepulveda/Rosecrans Site Rezoning and Plaza El Segundo Development*. October. Los Angeles. Prepared for Community, Economic and Development Services Department, city of El Segundo, CA, and Mar Ventures, Torrance, CA. Electronic document, http://www.elsegundo.org/depts/planningsafety/planning/plaza_es/default.asp, accessed June 30, 2014.

CAJ&A 2008—Christopher A. Joseph & Associates. *Addendum to the Certified EIR, Plaza El Segundo Development Project El Segundo, California*. January. Prepared for Planning and Building Safety Department, city of El Segundo, CA. State Clearinghouse No. 2003121037. Electronic document, http://www.elsegundo.org/civicax/filebank/blobdload.aspx?blobid=4709, accessed June 30, 2014.

Caltrans 1978—California Department of Transportation. *Historic Property Survey, Del Amo Boulevard – Normandie Avenue to Harbor Freeway*. On file, South Central Coastal Information Center, California Historical Resources Information System, Fullerton. Study LA-03810.

CDM Smith 2013—CDM Smith. *United Airlines Los Angeles International Airport (LAX) Terminal 7 Improvement Project Initial Study – Proposed Negative Declaration*. March 28. Irvine, CA. Prepared for Los Angeles World Airports, city of Los Angeles. Electronic document, http://www.lawa.org/uploadedFiles/OurLAX/pdf/UA%20T7_Initial%20Study%20for%20public%20review_March%2028_2013.pdf, accessed July 9, 2014.

CEC 2002—California Energy Commission. *Final Staff Assessment – El Segundo Redevelopment Project*. September. On file, Dockets Unit, California Energy Commission, Sacramento. Docket No. 00-AFC-14. TN 26655.

CEC 2013a—California Energy Commission. *El Segundo Energy Center Amendment, (00-AFC-14C), Data Request Set 1 (Nos. 1 - 83)*. August 12. Sacramento, CA. Submitted to NRG Energy, Carlsbad, CA. On file, Dockets Unit, California Energy Commission, Sacramento. TN 200155.

CEC 2013b—California Energy Commission. Electronic Mail Regarding ESPFM - Cultural Resources DR Checklist. November 19. Sacramento, CA. Submitted to NRG, Carlsbad, CA.

CEQ 1997—Council on Environmental Quality. *CEQ Guidance Regarding Environmental Justice*. December 10.

Chambers 2001—Carol Chambers. One Man's Crusade to Take a Peak into History. *Los Angeles Times*, August 13. Los Angeles.

Christy 2002—Juliet L. Christy. *West Basin Water Recycling Plant Expansion Project, El Segundo, Ca*. Greenwood and Associates. On file, South Central Coastal Information Center, California Historical Resources Information System, Fullerton. Study LA-05756.

City Council 2011—City of Los Angeles. Notice of Council Action. September 19. Council File No. 11-0511-S1. Electronic document, http://clkrep.lacity.org/onlinedocs/2011/11-0511-S1_ca_9-16-11.pdf, accessed July 9, 2014.

Clewlow 1974—Carl W. Clewlow. *Evaluation of the Archaeological Resources and Potential Impact of Proposed New Freeway Construction on the Harbor Freeway (Route 11) and the Artesia Freeway (Route 91) [An Environmental Impact Report]*. Institute of Archaeology, Archaeological Survey, University of California, Los Angeles. On file, South Central Coastal Information Center, California Historical Resources Information System, Fullerton. Study LA-00114.

COE 1944—Corps of Engineers, U.S. Army. Redondo Quadrangle. 15-minute Topographic Series. Surveyed 1923, revised aerial photography 1942. Washington, D.C.: U.S. Army. On file, South Central Coastal Information Center, California Historical Resources Information System, Fullerton.

Cohen et al. 2013—K. M. Cohen, S. Finney, and P. L. Gibbard (compilers). *International Chronostratigraphic Chart*. January. International Commission on Stratigraphy. Electronic document, http://www.stratigraphy.org/ICSchart/ChronostratChart2013-01.pdf, accessed January 17, 2014.

Conzen 1990—Michael P. Conzen. North American County Maps and Atlases. Chapter 8 in *From Sea Charts to Satellite Images: Interpreting North American History through Maps*, edited by David Buisseret, pp. 186–211. Chicago: The University of Chicago.

Cordell 1997—Linda Cordell. *Archaeology of the Southwest*. 2nd ed. San Diego, CA: Academic.

County of Los Angeles 2012—Department of Regional Planning. *Marina del Rey Land Use Plan*. February 8. Electronic document, http://planning.lacounty.gov/view/marina_del_rey_land_use_plan, accessed December 5, 2013.

Crawford 2012—K. A. Crawford. DPR 523 Primary Record Form and Attachments for 19-10098 (El Segundo Power Generating Station). February 20. Crawford Historic Services. On file, South Central Coastal Information Center, California Historical Resources Information System, Fullerton.

Crawford 2013—K. A. Crawford. DPR 523 Primary Record Form and Attachments for 19-190646 (SCE Tower #M7-T4 Mesa Redondo). July 20. Crawford Historic Services. On file, South Central Coastal Information Center, California Historical Resources Information System, Fullerton.

D'Altroy 1975—Terence N. D'Altroy. *Evaluation of the Potential Impact on Archaeological Resources of the Proposed Hyperion Treatment Plant – Interim Sludge Processing and Disposal System*. Archaeological Survey, University of California, Los Angeles. Prepared for city of Los Angeles. On file, South Central Coastal Information Center, California Historical Resources Information System, Fullerton. Study LA-04051.

Davis 1961—James T. Davis. *Trade Routes and Economic Exchange Among the Indians of California*. Report 54. Berkeley: University of California Archaeological Survey.

Day 1869—Clinton Day. *Map of Private Grants and Public Lands Adjacent to Los Angeles and San Diego, in the Southern Part of California*. June. San Francisco: Britton & Rey. On file, California History Room, California State Library, Sacramento.

Dillon 1984a—Brian D. Dillon. *An Archaeological Survey and Impact Assessment of a 9.9 Acre Parcel at 190th Street and the Harbor Freeway, city of Los Angeles, California*. December 16. Brian D. Dillon Consulting Archaeologist, Sepulveda, CA. Prepared for Engineering Technology, Sherman Oaks, CA. On file, South Central Coastal Information Center, California Historical Resources Information System, Fullerton. Study LA-01445.

Dillon 1984b—Brian D. Dillon. *An Archaeological Survey and Impact Assessment of a 6.6 Acre Parcel at 190th Street and Pacific Gateway Drive-Normandie Avenue, city of Los Angeles, California*. July 7. Brian D. Dillon Consulting Archaeologist, Sepulveda, CA. Prepared for Psomas and Associates, Santa Monica, CA. On file, South Central Coastal Information Center, California Historical Resources Information System, Fullerton. Study LA-01373.

Dillon 1985—Brian D. Dillon. *An Archaeological Survey and Impact Assessment of a 5.2 Acre Parcel at 19800 South Vermont Avenue in the city of Los Angeles, California*. May 13. Brian D. Dillon Consulting Archaeologist, Sepulveda, CA. Prepared for Planning Department, Engineering Technology, Sherman Oaks, CA. On file, South Central Coastal Information Center, California Historical Resources Information System, Fullerton. Study LA-01467.

DRP 2013—Department of Regional Planning. *Environmental Checklist Form (Initial Study) for Parcel 44 Development/ Project No. R2013-01647/ Case No(s). ENV201300142*. County of Los Angeles. Electronic document, http://planning.lacounty.gov/assets/upl/case/r2013-01647_initial-study.pdf, accessed July 15, 2014.

Duke 1999a—Curt Duke. Cultural Resources Assessment for Pacific Bell Mobile Services Facility La 895-05, in the County of Los Angeles, California. LSA Associates, Irvine, CA. On file, South Central Coastal Information Center, California Historical Resources Information System, Fullerton. Study LA-06242.

Duke 1999b—Curt Duke. Cultural Resources Assessment for Pacific Bell Mobile Services Facility La 942-04, in the County of Los Angeles, California. LSA

Associates, Irvine, CA. On file, South Central Coastal Information Center, California Historical Resources Information System, Fullerton. Study LA-04647.

Duke 1999c—Curt Duke. Letter Regarding Records Search Results for Sprint Pcs Facility La03xc380g (the Union Pacific/Aviation Site), Located in the County of Los Angeles, California. LSA Associates, Irvine, CA. Prepared for ATC Associates, Arcadia, CA. On file, South Central Coastal Information Center, California Historical Resources Information System, Fullerton. Study LA-04762.

Duke 2000a—Curt Duke. Cultural Resources Assessment for Pacific Bell Mobile Services Facility La 483-03, in the County of Los Angeles, California. LSA Associates. On file, South Central Coastal Information Center, California Historical Resources Information System, Fullerton. Study LA-04861.

Duke 2000b—Curt Duke. Cultural Resource Assessment for Pacific Bell Wireless Facility La 494-03, County of Los Angeles, California. LSA Associates. On file, South Central Coastal Information Center, California Historical Resources Information System, Fullerton. Study LA-05560.

Duke 2002a—Curt Duke. Cultural Resources Assessment, AT&T Wireless Services Facility No. 05002a, Los Angeles County, California. LSA Associates. On file, South Central Coastal Information Center, California Historical Resources Information System, Fullerton. Study LA-05758.

Duke 2002b—Curt Duke. Cultural Resources Assessment, AT&T Wireless Services Facility No. 05195ca, Los Angeles County, California. LSA Associates. On file, South Central Coastal Information Center, California Historical Resources Information System, Fullerton. Study LA-06243.

Dunlap 2014—Sam Dunlap. Electronic mail, dated March 20, 2014, to Thomas Gates Regarding El Segundo Energy Center (00-AFC-14c) Tribal Consultation. On file, Dockets Unit, California Energy Commission, Sacramento. Docket No. 00-AFC-14. TN 201944.

Dyas 2012—Mary Dyas. Electronic Mail to Scott Seipel Regarding El Segundo Cultural Find of 2-23-2012. February 24. Siting, Transmission, and Environmental Protection Division, California Energy Commission, Sacramento. 00-AFC-14C.

Eberhart 1953a—[Hal] Eberhart. Archeological Survey of Southern California Record Card for CA-LAn-202 (Site LA-20). June 5. On file, South Central Coastal Information Center, California Historical Resources Information System, Fullerton.

Eberhart 1953b—[Hal] Eberhart. Archaeological Site Survey Record for CA-LAn-202 (LA-20). June 5. On file, South Central Coastal Information Center, California Historical Resources Information System, Fullerton.

EcoTierra 2013—EcoTierra Consulting. *Addendum to the Certified EIR for the Plaza El Segundo Development Project*. August. Prepared for Planning and Building Safety Department, city of El Segundo, CA. Environmental Assessment No. EA-993/Case Nos. DA 12-03, ZTA 12-04, ADJ 13-03, Variance 13-01, AUP 13-04.

State Clearinghouse No. 2003121037. Electronic document, http://www.elsegundo.org/civicax/filebank/blobdload.aspx?BlobID=11005, accessed June 30, 2014.

EDR 2000a—Environmental Data Resources. The EDR-Historical Topographic Map Report, El Segundo Generating Station, 301 Vista Del Mar Boulevard, El Segundo, CA 90245. October 27. Southport, CT. Inquiry No. 556007-6. Attachment A to *Phase I Environmental Site Assessment, El Segundo Generating Station, 301 Vista Del Mar Boulevard, El Segundo, California*, by URS. December. Santa Barbara, CA. Submitted to NRG Energy. Appendix T in *Application for Certification: El Segundo Power Redevelopment Project*, by El Segundo Power II. December 2000. Submitted to California Energy Commission, Sacramento. Docket No. 00-AFC-14. TN 17430.

EDR 2000b—Environmental Data Resources. The EDR-Aerial Photography Print Service, El Segundo Generating Station, 301 Vista Del Mar Boulevard, El Segundo, CA 90245. October 27. Southport, CT. Inquiry No. 556007-7. Attachment A to *Phase I Environmental Site Assessment, El Segundo Generating Station, 301 Vista Del Mar Boulevard, El Segundo, California*, by URS. December. Santa Barbara, CA. Submitted to NRG Energy. Appendix T in *Application for Certification: El Segundo Power Redevelopment Project*, by El Segundo Power II. December 2000. Submitted to California Energy Commission, Sacramento. Docket No. 00-AFC-14. TN 17430.

Eggers 1977—A. V. Eggers. *Cultural Resources Inventory of the City of Carson, California*. February 18. Prepared for Community Development Department, city of Carson, CA. On file, South Central Coastal Information Center, California Historical Resources Information System, Fullerton. Study LA-04512.

El Segundo 1980—City of El Segundo. City of El Segundo Local Coastal Program.

Electronic document, http://www.elsegundo.org/civica/filebank/blobdload.asp?BlobID=3731, accessed October 18, 2013.

El Segundo 2000—City of El Segundo. *Downtown Specific Plan*. August 1, 2000, updated 2014.

Englehardt 1908–1915—Zephyrin Englehardt. *The Missions and Missionaries of California*. 4 vols. San Francisco: James H. Barry.

Englehardt 1927a—Zephyrin Englehardt. *San Fernando Rey: The Mission of the Valley.* Chicago: Franciscan Herald.

Englehardt 1927b—Zephyrin Englehardt. *San Gabriel Mission and the Beginnings of Los Angeles.* San Gabriel, CA: San Gabriel Mission.

Engstrom 2006—Wayne N. Engstrom. Nineteenth Century Coastal Geomorphology of Southern California. *Journal of Coastal Research* 22:847–861.

Environmental Audit 2011—Environmental Audit. *Initial Study for: Chevron Products Company El Segundo Refinery Coke Drum Reliability Project*. October.

Submitted to South Coast Air Quality Management District, Diamond Bar, CA. Electronic document, http://www.aqmd.gov/docs/default-source/ceqa/documents/permit-projects/2012/2012appendix_a.pdf?sfvrsn=4, accessed June 30, 2014.

ESEC 2013a—El Segundo Energy Center, with CH2M Hill. *El Segundo Energy Center Petition to Amend (00-AFC-14C)*. April. On file, Dockets Unit, California Energy Commission, Sacramento. Docket No. 00-AFC-14C.

ESEC 2013b—El Segundo Energy Center, with CH2M Hill. *El Segundo Energy Center Petition to Amend (00-AFC-14C): Cultural Resources Data Response (Response to CEC Request for Supplemental Data Dated October 1, 2013)*. December 3. CH2MHill, Sacramento, CA. Submitted to California Energy Commission, Sacramento. Dockets Unit No. 00-AFC-14C. TN 201363.

ESEC 2013c—El Segundo Energy Center, with CH2M Hill. *El Segundo Energy Center Petition to Amend, El Segundo Power Facility Modification (00-AFC-14C): Data Responses, Set 1 (Response to Data Requests 1 to 83)*. September 12. El Segundo, CA, and Sacramento, CA. Submitted to California Energy Commission, Sacramento. Dockets Unit No. 00-AFC-14C. TN 200464.

ESEC 2014a—El Segundo Energy Center, with CH2M Hill. *El Segundo Energy Center, Petition to Amend (00-AFC-14C): Cultural Resources Data Response (Supplemental Response to CEC Data Request 78)*. January 20. El Segundo, CA, and Sacramento, CA. Submitted to California Energy Commission, Sacramento. Docket No. 00-AFC-14C. TN 201578.

ESEC 2014b—El Segundo Energy Center, with CH2M Hill. *El Segundo Energy Center Petition to Amend (00-AFC-14C) Cultural Resources Data Response (Supplemental Response to CEC Data Request 78)*. March 5. CH2M Hill, Sacramento, CA. Submitted to California Energy Commission, Sacramento. Confidential document filed March 28, 2014, Dockets Unit, California Energy Commission, Sacramento. TN 201991.

ESP 2000—El Segundo Power II. *Application for Certification, El Segundo Power Redevelopment Project*. December. Submitted to California Energy Commission, Sacramento. Docket No. 00-AFC-14. On file, Dockets Unit, California Energy Commission, Sacramento. TN 17430.

ESPR 2001—El Segundo Power Station. *Buildings Near the Proposed Water Minas POS*. April 20. Submitted to California Energy Commission, Sacramento.

FAA 2005—Federal Aviation Administration. *Record of Decision: Proposed LAX Master Plan Improvements, Los Angeles International Airport, Los Angeles, Los Angeles County, California*. May 20. Western-Pacific Region, Federal Aviation Administration, U.S. Department of Transportation, Hawthorne, CA.

Foster 2002—John M. Foster. *Highway Project for Bridge Improvement Program-182nd Street Bridge ofver the Dominguez Channel in the city of Los Angeles*. August 19. District 7, California Department of Transportation. On file, South

Central Coastal Information Center, California Historical Resources Information System, Fullerton. Study LA-06201.

FTA and LACMTA 2011a—Federal Transit Administration and Los Angeles County Metropolitan Transportation Authority. *Crenshaw/LAX Transit Corridor Final Environmental Impact Statement/Final Environmental Impact Report*. August. U.S. Department of Transportation and Los Angeles County Metropolitan Transportation Authority. Electronic document, http://www.metro.net/projects/crenshaw_corridor/crenshaw-feis-feir/, accessed July 15, 2014.

FTA and LACMTA 2011b—Federal Transit Administration and Los Angeles County Metropolitan Transportation Authority. *Crenshaw/LAX Transit Corridor Supplemental Draft Environmental Impact Statement / Recirculated Draft Environmental Impact Report*. February. U.S. Department of Transportation and Los Angeles County Metropolitan Transportation Authority. Electronic document, http://www.metro.net/projects/crenshaw_corridor/crenshaw-sdeisrdeir/, accessed July 15, 2014.

FTA and LACMTA 2012—Federal Transit Administration and Los Angeles County Metropolitan Transportation Authority. *Crenshaw/LAX Transit Corridor Supplemental Environmental Assessment*. July. Electronic document, http://media.metro.net/projects_studies/crenshaw/images/SEAR/crenshaw_sear_cover-toc.pdf, accessed July 15, 2014.

Gabrielino-Tongva Tribe 2014a—Gabrielino-Tongva Tribe. Tribal History - Lost Treaty Rights And Current Status. Gabrielino-Tongva Tribe website. Electronic document, http://www.gabrielinotribe.org/TribalHistory/tribal_history.cfm, accessed February 5, 2014.

Gabrielino-Tongva Tribe 2014b—Gabrielino-Tongva Tribe. Casino Project Gabrielino-Tongva Tribe website. Electronic document, http://www.gabrielinotribe.org/TribalHistory/tribal_history.cfm, accessed February 5, 2014.

Gardena 2006—City of Gardena. *City of Gardena General Plan 2006*. Electronic document, http://www.ci.gardena.ca.us/generalplan.html, accessed December 5, 2013.

Getchell and Atwood 2006—Barbie Getchell and John Atwood. *Archaeological and Historical Evaluations for the Proposed Airport Surveillance Detection Equipment, Model 3X (ASDE-3X) to Serve Los Angeles International Airport (LAX), Los Angeles, Los Angeles County, California*. October. PAST, Encino, CA. PAST File No. 1182. Prepared for SRI International, Menlo Park, CA. SRI International P.O. No. 59-001122. On file, South Central Coastal Information Center, California Historical Resources Information System, Fullerton. Study LA-11560.

Gillean and Sanka 2013—William R. Gillean and Jennifer M. Sanka. Letter Regarding California Historical Resources Information System (CHRIS) Records Search, Native American Heritage Commission (NAHC) Sacred Lands File (SLF)

Database Search, and Information-Scoping Results for the 888 North Sepulveda Project, city of El Segundo, Los Angeles County, California. August 19. Atkins North America, San Bernardino, CA. Prepared for Planning and Building and Safety Department, city of El Segundo, CA. Appendix C to *city of El Segundo, 888 North Sepulveda Boulevard Specific Plan Project Initial Study/Mitigated Negative Declaration*, by Atkins. Draft. December 2013. Los Angeles. Prepared for Planning and Building and Safety Department, city of El Segundo, CA. Environmental Assessment No. 997; General Plan Amendment 12-03; Zone Change 12-03; Zone Text Amendment 12-05; Specific Plan 12-05; Conditional Use Permit 12-08; Development Agreement 12-04; Subdivision 12-07; and Parking Demand Study 12-06. Electronic document, http://www.elsegundo.org/civicax/filebank/blobdload.aspx?BlobID=11371, accessed July 9, 2014.

Glassow et al. 2007—Michael A. Glassow, Lynn H. Gamble, Jennifer E. Perry, and Glenn S. Russell. Prehistory of the Northern California Bight and the Adjacent Transverse Ranges. Chapter 13 in *California Prehistory: Colonization, Culture, and Complexity*, edited by Terry L. Jones and Kathryn A. Klar, pp. 191–213. Lanham, MD: AltaMira.

GLO 1858—General Land Office. *Map of the Rancho San Pedro, Finally Confirmed to Manuel Dominguez et al* [sic]. Surveyed December 1857. Approved February 19, 1858. San Francisco. Electronic document, http://dpw.lacounty.gov/sur/nas/landrecords/patentmap/P01/P01-119.pdf?__utma=1.1671876017.1394574108.1394574108.1394574108.1&__utmb=1.36.10.1394574108&__utmc=1&__utmx=-&__utmz=1.1394574108.1.1.utmcsr=(direct)|utmccn=(direct)|utmcmd=(none)&__utmv=-&__utmk=108466818, accessed March 11, 2014.

GLO 1868—General Land Office. *Plat of Township No. 3 South, Range No. 14 West, San Bernardino Meridian*. Surveyed 1853, 1857, and 1868. Electronic document, http://dpw.lacounty.gov/sur/nas/landrecords/Township/T%203%20S%20R%2014%20W.pdf, accessed May 12, 2014.

GLO 1875—General Land Office. *Plat of the Rancho Sausal Redondo Finally Confirmed to Antonio Ignacio Abila*. Surveyed 1868. Electronic document, http://dpw.lacounty.gov/sur/nas/landrecords/patentmap/P01/P01-507.pdf?__utma=1.1676737047.1356023390.1370280849.1394638833.7&__utmb=1.27.10.1394638833&__utmc=1&__utmx=-&__utmz=1.1394638833.7.1.utmcsr=(direct)|utmccn=(direct)|utmcmd=(none)&__utmv=-&__utmk=146275380, accessed March 11, 2014.

Gray 1999—Deborah Gray. Cultural Resources Assessment for Pacific Bell Mobile Services Facility La 859-05 in the County of Los Angeles, California. LSA Associates. On file, South Central Coastal Information Center, California Historical Resources Information System, Fullerton. Study LA-04761.

Grenda and Altschul 1994—Donn R. Grenda and Jeffrey H. Altschul. The Evolution of Coastal Settlements: A View from the Ballona Lagoon. *Proceedings of the Society for California Archaeology* 7:213–226.

Grenda and Altschul 2002a—Donn R. Grenda and Jeffrey H. Altschul. A Moveable Feast: Isolation and Mobility among Southern California Hunter-Gatherers. In *Islanders and Mainlanders: Prehistoric Context for the Southern California Bight*, edited by Jeffrey H. Altschul and Donn R. Grenda, pp. 113–146. Tucson, AZ: SRI.

Grenda and Altschul 2002b—Donn R. Grenda and Jeffrey H. Altschul. Complex Cultures, Complex Arguments: Sociopolitical Organization in the Bight. In *Islanders and Mainlanders: Prehistoric Context for the Southern California Bight*, edited by Jeffrey H. Altschul and Donn R. Grenda, pp. 147–178. Tucson, AZ: SRI.

Gust et al. 2009—Sherri Gust, Kim Scott, and Amy Glover. *Cultural Resources Assessment for the Scattergood Olympic Line 1 Project, Los Angeles, California*. September. Cogstone, Orange, CA. Prepared for ICF Jones & Stokes, Irvine, CA.

Hardacre 1971—Emma Hardacre. The Lone Woman of San Nicolas Island. In *The California Indians: A Source Book*, compiled and edited by R. F. Heizer and M. A. Whipple, pp. 272–284. 2nd ed. Berkeley: University of California.

Harper and Smith 2008—Caprice D. Harper and Francesca Smith. *Preliminary Cultural Resources Survey for the Formation of the Wiseburn Unified School District Project, Cities of El Segundo and Hawthorne, and Unincorporated Los Angeles County, CA*. SWCA Environmental Consultants. On file, South Central Coastal Information Center, California Historical Resources Information System, Fullerton. Study LA-10160.

Harrington 1933—John P. Harrington. *Annotations of Alfred Robinson's Chinigchinich.* Santa Ana: California Fine Arts.

Harrington 1942—John P. Harrington. Culture Element Distributions, XIX: Central California Coast. *Anthropological Records* 7(1):1–46.

Haskell 1991—Lynn Haskell. National Register of Historic Places Registration Form and Continuation Sheets, El Segundo Urho Saari Swim Stadium. January 7. city of El Segundo Recreation Department. On file, South Central Coastal Information Center, California Historical Resources Information System, Fullerton[27] and Office of Historic Preservation, Sacramento.

Heizer 1968—Robert F. Heizer (ed.). *The Indians of Los Angeles County: Hugo Reid's Letters of 1852*. Southwest Museum Papers 21. Los Angeles: Southwest Museum.

Hirsh 2002—Richard F. Hirsh. *Powering The Past: A Look Back*. September. Washington, D.C.: Smithsonian Institution. Electronic document, http://americanhistory.si.edu/powering/backpast.htm, accessed January 22, 2014.

[27] On file at SCCIC as of May 13, 2014.

Hodge 1971—Frederick W. Hodge (ed.). *Handbook of American Indians North of Mexico*, Part I. Bulletin 30. Bureau of American Ethnology, Smithsonian Institution. New York: Rowman and Littlefield.

Hogan et al. 2005—Michael Hogan, Bai "Tom" Tang, Josh Smallwood, Laura H. Shaker, and Casey Tibbitt. *Identification and Evaluation of Histopric Properties: West Basin Municipal Water District Harbor-South Bay Water Recycling Project, Proposed Project Laterals, Southwestern Los Angeles County, California*. May 20. CRM TECH, Riverside, CA. Contract No. 1578. Submitted to Tom Dodson and Associates, San Bernardino, CA. On file, South Central Coastal Information Center, California Historical Resources Information System, Fullerton. Study LA-10567.

Holson 2002—John Holson. *Archaeological Survey and Record Search for Ospc-0036, La/Torrance, Torrance and Los Angeles, Los Angeles County (800-39)*. Pacific Legacy. On file, South Central Coastal Information Center, California Historical Resources Information System, Fullerton. Study LA-06193.

Hudson 1971—Dee T. Hudson. Proto-Gabrielino Patterns of Territorial Organization in South Coastal California. *Pacific Coast Archaeological Society Quarterly* 7(2):49–76.

Ilahiane and Altschul 2002—Hsain Ilahiane and Jeffrey H. Altschul. Islanders and Mainlanders: A Critical Review of the Anthropological Literature. Chapter 2 in *Islanders and Mainlanders: Prehistoric Context for the Southern California Bight*, edited by Jeffrey H. Altschul and Donn R. Grenda, pp. 11–40. Tucson, AZ: SRI.

Johnson 1961—K. Johnson. Archaeological Site Survey Record for 4-LAN-47 [CA-LAN-47]. May 5. On file, South Central Coastal Information Center, California Historical Resources Information System, Fullerton.

Johnston 1962—Bernice E. Johnston. *California's Gabrielino Indians.* Los Angeles: Southwest Museum.

Jones 2008—Terry L. Jones. Culture or Adaptation: Millingstone Reconsidered. In *Avocados to Millingstones: Papers in Honor of D. L. True*, edited by Georgie Waugh and Mark E. Basgall, pp. 137–153. December. Monographs in California and Great Basin Anthropology 5. Archaeological Research Center, California State University, Sacramento.

Jones & Stokes 2000—Jones & Stokes. *Cultural Resources Investigations for the Nextlink Fiberoptic Project, Los Angeles and Orange Counties, California (First Addendum)*. Sacramento, CA. Prepared for Nextlink. Project No. 17033-2. On file, South Central Coastal Information Center, California Historical Resources Information System, Fullerton. Study LA-06249.

Jones & Stokes 2001—Jones & Stokes. *Monitoring Report for Xo California Builds – 1920 Maple Avenue, El Segundo, California, and 4000 MacArthur Blvd, Newport Beach, California*. Sacramento, CA. On file, South Central Coastal Information Center, California Historical Resources Information System, Fullerton. Study LA-05536.

Jones & Stokes Associates 1997—Jones & Stokes Associates. *Cultural Resource Investigation for the Proposed Willows Wetland Restoration Project*. On file, South Central Coastal Information Center, California Historical Resources Information System, Fullerton. Study LA-03572.

JRP 2000—JRP Historical Consulting. *Historic Evaluation of the El Segundo Generating Station, El Segundo, Los Angeles County, California*. October. On file, Cultural Resources Unit, California Energy Commission, Sacramento.

JRP 2001—JRP Historical Consulting. *Form DPR 523 Records: Buildings near the Proposed Water Mains for the El Segundo Power Redevelopment Project, El Segundo, California*. March 27. Davis, CA. Prepared for URS Corp., Oakland, CA. On file, Dockets Unit, California Energy Commission, Sacramento. 00-AFC-14. TN 19836.

JRP 2013—JRP Historical Consulting. *Historic Resources Inventory and Evaluation Update Report for the El Segundo Energy Center*. December. Davis, CA. On file, Dockets Unit, California Energy Commission, Sacramento. Docket Unit No. 00-AFC-14C. TN 201462.

Jurmain and McCawley 2009—Claudia Jurmain and William McCawley. *O, My Ancestor: Recognition and Renewal for the Gabrielino-Tongva People of the Los Angeles Area.* Berkeley, CA: Heyday Books.

Kessell 2002—John L. Kessell. *Spain in the Southwest: A Narrative History of Colonial New Mexico, Arizona, Texas, and California.* Norman: University of Oklahoma.

King 1978—Chester King. Protohistoric and Historic Archeology. In *California*, edited by Robert F. Heizer, pp. 58–68. Handbook of North American Indians, Vol. 8, William C. Sturtevant, general editor. Washington, D.C.: Smithsonian Institution.

King 1968—Tom King. An Attempt to Revisit LAn-202, November 9, 1968. November 11. On file, South Central Coastal Information Center, California Historical Resources Information System, Fullerton.

Kirk 2008a—**Robin Kirk.** State of California DPR Primary Record Form and Attachments for P-19-189240, Scott Residence. March 10. Manhattan Beach Cultural Heritage Conservancy. On file, South Central Coastal Information Center, California Historical Resources Information System, Fullerton.

Kirk 2008b—**Robin Kirk.** State of California DPR Primary Record Form and Attachments for P-19-189244, Salaman Residence. March 10. Manhattan Beach Cultural Heritage Conservancy. On file, South Central Coastal Information Center, California Historical Resources Information System, Fullerton.

Kroeber 1976—A. L. Kroeber. *Handbook of the Indians of California.* New York: Dover. Reprint. Originally published in 1925 as *Bulletin 78*, Bureau of American Ethnology, Smithsonian Institution, Washington, D.C.

LAWA 2005—Los Angeles World Airports. *Draft Environmental Impact Report (Draft EIR) for the South Airfield Improvement Project, Los Angeles International*

Airport. August. city of Los Angeles. Electronic document, http://www.lawa.org/uploadedFiles/OurLAX/Past_Projects_and_Studies/SAIP_DraftIER_Volume%201.pdf, accessed May 22, 2014.

LAWA 2011—Los Angeles World Airports. *Draft Initial Study/Mitigated Negative Declaration for Los Angeles International Airport (LAX) Southwest Remain Overnight (RON) Apron Project*. February. city of Los Angeles. File No. NG-11-025-AD. Electronic document, http://www.lawa.org/uploadedFiles/OurLAX/Past_Projects_and_Studies/LAX-SW-RON-Initial-Study-Draft-Feb-2011-Web-Final.pdf, accessed May 23, 2014.

LAWA 2012a—Los Angeles World Airports. *Draft Environmental Impact Report for LAX Specific Plan Amendment Study*. July. city of Los Angeles. Electronic document, http://www.lawa.org/LAXSPAS/Reports.aspx#, accessed May 23, 2014.

LAWA 2012b—Los Angeles World Airports. *Initial Study for LAX West Aircraft Maintenance Area Project*. September 14. city of Los Angeles. Electronic document, http://www.lawa.org/uploadedFiles/OurLAX/Current_Projects_and_Studies/Final_West_Aircraft_Maintenance_Area_Initial_Study.pdf, accessed July 10, 2014.

LAWA 2013a—Los Angeles World Airports. *Initial Study for LAX Midfield Satellite Concourse*. February 8. city of Los Angeles. Electronic document, http://www.lawa.org/MSCNorth/pdf/LAX%20MSC%20Initial%20Study_020613_Final_public.pdf, accessed July 10, 2014.

LAWA 2013b—Los Angeles World Airports. *Revised Draft Environemtnal Impact Report (Revised Draft EIR) for Los Angeles International Airport (LAX) Runway 7L/25R Runway Safety Area (RSA) and Associated Improvements Project (Runway Safety Area Improvements and Pavement Reconstructions of Portions of Runway 7L/25R, Taxiway B, and Apron West of Air Freight Building No. 8)*. December. city of Los Angeles. Electronic document, http://www.lawa.org/uploadedfiles/OurLAX/pdf/LAX%20RSA%20South_Revised%20DEIR_121213.pdf, accessed July 11, 2014.

LAWA 2013c—Los Angeles World Airports. *Initial Study for LAX Runway 6L-24R Safety Area & Associated Improvements*. August 22. city of Los Angeles.

Leonard 1974—Nelson Leonard. *Archaeological Study of LAX*. On file, South Central Coastal Information Center, California Historical Resources Information System, Fullerton. Study LA-00096.

Leonard 1975—N. Leonard. *Hyperion Plant*. On file, South Central Coastal Information Center, California Historical Resources Information System, Fullerton. Study LA-00125.

Leonard 1976—Nelson N. Leonard III. *Los Angeles International Airport Series Volume 1, Draft Environmental Impact Statement*. July. Olson Laboratories, Anaheim, CA. Prepared for Los Angeles Department of Airports and Federal

Aviation Administration. On file, South Central Coastal Information Center, California Historical Resources Information System, Fullerton. Study LA-01982.

Lewis 1987—Brandon Lewis. Records Search Results Letter Regarding North Outfall Sewer Replacement Project. March 17. Southern California Archaeological Survey, The Institute of Archaeology, University of California, Los Angeles. Prepared for Myra L. Frank & Associates, Los Angeles. Appendix A in *Negative Archaeological Survey Reoirt for Areas Relating to the North Ourtfall Replacement Sewer Project, Los Angeles County, California*, by Robert J. Wlodarski. June 5. Historical, Environmental, Archaeological, Research, Team, Chatsworth, CA. Prepared for Myra L. Frank & Associates, Los Angeles. On file, South Central Coastal Information Center, California Historical Resources Information System, Fullerton. Study LA-00309.

Lightfoot and Parrish 2009—Kent G. Lightfoot and Otis Parrish. *California Indians and their Environment: An Introduction*. California Natural History Guides 96. Berkeley: University of California.

Little et al. 2000—Barbara Little, Erika M. Seibert, Jan Townsend, John H. Sprinkle Jr., and John Knoerl. *Guidelines for Evaluating and Registering Archeological Properties*. National Register Bulletin, National Park Service, U.S. Department of the Interior.

Los Angeles 2004—City of Los Angeles. *LAX Master Plan Final EIS/EIR*. April. Electronic document, http://www.lawa.org/ourLAX/PastProjects.aspx?id=8844, accessed May 22, 2014.

Los Angeles 2008—City of Los Angeles. *Draft Environmental Impact Report (Draft EIR) for Los Angeles International Airport (LAX) Crossfield Taxiway Project, Volume 1: Main Document*. September. State Clearinghouse No. 2008041058. Electronic document, http://www.lawa.org/uploadedFiles/OurLAX/Past_Projects_and_Studies/CFTP%20DEIR%20Volume%201.pdf, accessed May 22, 2014.

Los Angeles 2009—City of Los Angeles. *Draft Environmental Impact Report (Draft EIR) for Los Angeles International Airport (LAX) Bradley West Project [formerly Los Angeles International Airport (LAX) Tom Bradley International Terminal (TBIT) Reconfiguration Project]*. May. 2 vols. Los Angeles City File No. AD 043-08. State Clearinghouse No. 2008121080.

McCawley 1996—William McCawley. *The First Angelinos: The Gabrielino Indians of Los Angeles.* Banning, CA: Malki Museum.

McCawley 2002—William McCawley. A Tale of Two Cultures: The Chumash and the Gabrielino. Chapter 3 in *Islanders and Mainlanders: Prehistoric Context for the Southern California Bight*, edited by Jeffrey H. Altschul and Donn R. Grenda, pp. 41–65. Tucson, AZ: SRI.

McKenna 1992—Jeanette A. McKenna. *Phase I Cultural Resource Inestigations of the Propsoed Family Camp Project Area, Los Angeles Air Firce Station, El Segundo, Los Angeles County, California*. McKenna et al. On file, South Central Coastal

Information Center, California Historical Resources Information System, Fullerton. Study LA-02570.

McKenna 2002a—Jeanette A. McKenna. Letter Regarding Review of Cultural Resiources Assessment/Evaluation for Nextel Communications Site CA-6518-d, Los Angeles, Los Angeles County, California. Janaury 4. McKenna et al., Whittier, CA. Submitted to Office of Historic Preservation, Sacramento, CA. On file, South Central Coastal Information Center, California Historical Resources Information System, Fullerton. Study LA-05708.

McKenna 2002b—Jeanette A. McKenna. Culturalo Resource Assessment/Evakluation for Nextel Communications Site CA-7803e, Los Angeles, Los Angeles County, California. McKenna et al., Whittier, CA. On file, South Central Coastal Information Center, California Historical Resources Information System, Fullerton. Study LA-06196.

McKenna 2012—Jeanette A. McKenna. Letter Regarding Record Search for the Proposed High School Site at 201 N. Douglas Street, El Segundo, Los Angeles County, California (USGS Venice Quadrangle; T3S, R14 W, Sec. 7; McKenna et al. Job 12.1585). October 1. McKenna et al., Whittier, CA. Submitted to The Planning Center, Santa Ana, CA. Appendix D in *Draft Wiseburn High School Environmental Impact Report*, by The Planning Center|DC&E. Santa Ana, CA. WISE-02.0E. Prepared for Wiseburn School District, Hawthorne, CA. SCH NO. 2011061056. Electronic document, http://wiseburn.k12.ca.us/new/Wiseburn%20High%20School/!Ch%2000.pdf, accessed July 11, 2014.

McLean 1998a—Deborah K. McLean. Letter Regarding Archaeological Assessment for Pacific Bell Mobile Services Telecommunications Facility La 859-03, 2616 Manhattan Avenue, city of Manhattan Beach, County of Los Angeles, California. August 14. LSA Associates, Irvine, CA. Prepared for Pacific Bell Mobile Services, Tustin, CA. On file, South Central Coastal Information Center, California Historical Resources Information System, Fullerton. Study LA-04190.

McLean 1998b—Deborah K. McLean. Archaeological Assessment for Pacific Bell Mobile Services Telecommunications Facility La 234-02, 1900 Hughes Way, city of El Segundo, County of Los Angeles, California. LSA Associates, Irvine, CA. On file, South Central Coastal Information Center, California Historical Resources Information System, Fullerton. Study LA-03955.

Maki 2000—Mary Maki. *Phase I Archaeological Investigations of Limited Areas within the Los Angeles Department of Water & Power's Harbor, Scattergood, & Valley Generating Stations, Los Angeles County, California (Torrance, Venice, & Van Nuys 7.5' Quadrangles)*. October 26. Conejo Archaeological Consultants, Thousand Oaks, CA. CAC Document 00-127. Prepared for ENSR, Camarillo, CA. On file, South Central Coastal Information Center, California Historical Resources Information System, Fullerton. Study LA-04907.

Maki 2005—Mary K. Maki. Letter Regarding Records Search Results for the Chevron El Segundo Refinery, El Segundo, Los Angeles County. August 12. Conejo

Archaeological Consultants, Thousand Oaks, CA. Prepared for ENSR, Camarillo, CA. On file, South Central Coastal Information Center, California Historical Resources Information System, Fullerton. Study LA-07722.

Masters and Aiello 2007—Patricia M. Masters and Ivano W. Aiello. Postglacial Evolution of Coastal Environments. In *California Prehistory: Colonization, Culture, and Complexity*, edited by Terry L. Jones and Kathryn A. Klar, pp. 35–51. Lanham, MD: AltaMira.

Matrix 20009—Matrix Environmental. *Manhattan Village Shopping Center Enhancement Project, Draft Environmental Impact Report (Draft EIR)*. Vol. I. Prepared for city of Manhattan Beach, CA. State Clearinghouse No. 2004061146. Electronic document, http://cms6ftp.visioninternet.com/manhattanbeach/manhattanvillage/index.html, accessed May 9, 2014.

Matrix 2012—Matrix Environmental. *Initial Study for Manhattan Village Shopping Center Improvement Project*. January. city of Manhattan Beach, CA. Electronic document, http://cms6ftp.visioninternet.com/manhattanbeach/manhattanvillage/files/MV%20App%20A-3%20-%20Initial%20Study.pdf, accessed June 30, 2014.

Maxwell 2002—Pamela J. Maxwell. Memorandum for Record: Harbor/ South Bay Water Recycling Project. December 3. Regional Planning Section, U.S. Army Corps of Engineers. On file, South Central Coastal Information Center, California Historical Resources Information System, Fullerton. Study LA-11150.

Mellon 2003—Knox Mellon. Letter Regarding West Basin Municipal Water District Harbor/South Bay Water Recycling Project. January 8. Office of Historic Preservation, Department of Parks and Recreation, Sacramento, CA. COE021209K. Submitted to Planning Division, Los Angeles District, U.S. Army Corps of Engineers, Los Angeles. On file, South Central Coastal Information Center, California Historical Resources Information System, Fullerton. Study LA-11150.

Merriam 1968—C. Hart Merriam. *Village Names in Twelve California Mission Records*. Edited by Robert F. Heizer. Survey Reports 74. Archaeological Survey, University of California, Berkeley.

Mikesell 2000—Stephen D. Mikesell. *Sensitivity Analysis of Linear, Parking, and Laydown Sites Associated with the El Segundo Generating Station Project, El Segundo, Los Angeles County, California*. November. JRP Historical Consulting Services, Davis, CA. Prepared for URS Corporation, Oakland, CA. On file, Cultural Resources Unit, California Energy Commission, Sacramento.

Mithun 1999—Marianne Mithun. *The Languages of Native North America.* Cambridge, UK: Cambridge University.

Moratto et al. 1978—Michael J. Moratto, Thomas F. King, and Wallace B. Woolfenden. Archaeology and California's Climate. *Journal of California Anthropology* 5:147–161.

Moriarty 1969—James R. Moriarty. *Chinigchinix, An Indigenous California Indian Religion.* Los Angeles: Southwest Museum.

MRS 2014—Marine Research Specialists. *E & B Oil Drilling & Production Project Final Environmental Impact Report*. June. Prepared for city of Hermosa Beach. SCH# 2013071038. Electronic document, http://www.hermosabch.org/ftp/oil_docs/FEIR%20Hermosa%20beach%20Oil%20Project_All%20Sections.pdf, accessed July 14, 2014.

Myers 1983—William A. Myers. *Iron Men and Copper Wires: A Centennial History of the Southern California Edison Company.* Trans-Anglo Books.

Myra L. Frank 1987—Myra L. Frank & Associates. *Historic Property Survey Report: North Outfall Relief Sewer (NORS)*. September 10. Los Angeles. Prepared for Department of Public Works, city of Los Angeles. On file, South Central Coastal Information Center, California Historical Resources Information System, Fullerton. Study LA-03673.

Ninyo & Moore 2007a—Ninyo & Moore. *Geotechnical Evaluation, NRG El Segundo Power Redevelopment, 301 Vista Del Mar, El Segundo, California*. April 26. Irvine, CA. Project No. 206954002. Prepared for Shaw Stone & Webster Engineering Consultant, Centennial, CO. On file, Dockets Unit, California Energy Commission, Sacramento.

Ninyo & Moore 2007b—Ninyo & Moore. *Supplemental Geotechnical Evaluation, NRG El Segundo Power Redevelopment, El Segundo, California*. April 6. Irvine, CA. Project No. 206954002. Prepared for Shaw Stone & Webster Engineering Consultant, Centennial, CO. On file, Dockets Unit, California Energy Commission, Sacramento. TN 201278.

Ninyo & Moore 2010—Ninyo & Moore. *Geotechnical Evaluation, NRG EL Segundo Power Redevelopment Project, El Segundo, California*. September 9. Irvine, CA. Project No. 207487001. Prepared for Siemens Energy, Orlando, FL. On file, Dockets Unit, California Energy Commission, Sacramento.

Noble 2014—Noble Consultants. *Third Year Annual Report, El Segundo Shoreline Monitoring Program at El Segundo, California*. February. Irvine, CA. Prepared for El Segundo Energy Center, El Segundo, CA. Attachment E to *El Segundo Energy Center Project (00-AFC-14C): California Energy Commission Condition of Certification Annual Compliance Report (Compliance-7), 2013 (August – December 2013)*, by El Segundo Energy Center. March 28. Submitted to California Energy Commission, Sacramento.

NPS 2007—National Park Service. *NPS-28: Cultural Resource Management Guideline*. Electronic document, http://www.nps.gov/history/history/online_books/nps28/28contents.htm, accessed January 23, 2014.

OHP 1989—Office of Historic Preservation. *California Archeological Inventory Handbook for Completing an Archeological Site Record, DPR 422 A – I (Rev.*

5/86). March. Sacramento, CA: Office of Historic Preservation, Department of Parks and Recreation.

OHP 1995—Office of Historic Preservation. *Instructions for Recording Historical Resources*. March. Sacramento, CA: Office of Historic Preservation. Electronic document, http://ohp.parks.ca.gov/pages/1054/files/manual95.pdf, accessed January 22, 2014.

OHP 2012—Office of Historic Preservation. Directory of Properties in the Historic Property Data Fiule for Los Angeles County. April 5. Sacramento, CA. On file, South Central Coastal Information Center, California Historical Resources Information System, Fullerton.

Ortiz 2013a—V. Ortiz. DPR 523 Record Forms for Scattergood-2 (P-19-004353). February 11. ESA, Los Angeles. On file, South Central Coastal Information Center, California Historical Resources Information System, Fullerton.

Ortiz 2013b—V. Ortiz. DPR 523 Record Forms for Scattergood-3 (P-19-004354). February 12. ESA, Los Angeles. On file, South Central Coastal Information Center, California Historical Resources Information System, Fullerton.

Ostashy 2000—Jan Ostashay. DPR 523 Record Form for World War II Munitions Storage Bunker [P-19-002386/CA-LAN-2386H]. August 3. PCR Services, Santa Monica, CA. Attachment 2 to *Section 106 Report*, by PCR Services Corporation. January 2001. Prepared for Los Angeles World Airports, city of Los Angeles, and Federal Aviation Administration, U.S. Department of Transportation, Los Angeles. Appendix I to *LAX Master Plan Final EIS/EIR*, by city of Los Angeles. April 2004. Electronic document, http://www.lawa.org/ourLAX/PastProjects.aspx?id=8844, accessed May 22, 2014.

Parsons 2002—Parsons. *Douglas Street Gap Closure, Intermodal Transit Center and Railroad Grade Separation Project, El Segundo, Los Angeles Countyu, California: Initial Study/Environmental Assessment*. Draft. October. Prepared for city of El Segundo, CA, State of California Department of Transportation, and Federal Highway Administration, U.S. Department of Transportation. Electronic document, http://www.elsegundo.org/depts/planningsafety/planning/douglas.asp, accessed May 9, 2014.

PBS&J 2008—PBS&J. *Segundo Business Park Draft Initial Study/Mitigated Negative Declaration*. December. Los Angeles. Prepared for city of El Segundo, CA. Environmental Assessment No. 788/Smoky Hollow Specific Plan Site Plan Review No. 08-01/Lot Line Adjustment No. 08-07/Subdivision No. 08-01. Electronic document, http://www.elsegundo.org/civicax/filebank/blobdload.aspx?blobid=5955, accessed June 30, 2014.

PCR 2001—PCR Services Corporation. *Section 106 Report*. Appendix I to *LAX Master Plan EIS/EIR*. January. Prepared for Los Angeles World Airports, city of Los Angeles, and Federal Aviation Administration, U.S. Department of Transportation, Los Angeles.

PCR 2003a—PCR Services Corporation. *Supplemental Section 106 Report*. June. Appendix S-G to *LAX Master Plan Supplement to the Draft EIS/EIR*. Prepared for Los Angeles World Airports, city of Los Angeles, and Federal Aviation Administration, U.S. Department of Transportation, Los Angeles.

PCR 2003b—PCR Services Corporation. *Draft Subsequent Environmental Impact Report: Mattel, Inc. Phase II of the Grand Way Project & 1955 East Grand Avenue*. September. Santa Monica, CA. State Clearinghouse No. 2003061104. Electronic document, http://www.elsegundo.org/depts/planningsafety/planning/mattel/issues/Subsequent%20EIR.pdf, accessed May 9, 2014.

PCR 2012—PCR Services Corporation. *Cultural Resources Documentation*. July. Santa Monica, CA. Prepared for Los Angeles World Airports, city of Los Angeles. Appendix E-1 to *Draft Environmental Impact Report for LAX Specific Plan Amendment Study*, by Los Angeles World Airports. July. city of Los Angeles. Electronic document, http://www.lawa.org/uploadedfiles/spas/pdf/SPAS%20DRAFT%20EIR/LAX%20SPAS%20DEIR%20App%20E-1%20Cultural%20Resources%20Final.pdf, accessed May 23, 2014.

Peak & Associates 1992—Peak & Associates. *Consolidated Report: Cultural Resources Studies for the Proposed Pacific Pipeline Project*. Revision 1. October 5. Sacramento, CA. Job No. 92-96. Prepared for L. W. Reed Consultants, Fort Collins, CO. On file, South Central Coastal Information Center, California Historical Resources Information System, Fullerton. Study LA-02950.

Pelto 2013—Pertti Pelto. *Applied Ethnography: Guidelines for Field Research.* Walnut Creek, CA: Left Coast Press.

Planning Commission 2012a—City of El Segundo. Agenda, 12/13/12 Planning Commission Special Meeting. Electronic document, http://www.elsegundo.org/civicax/filebank/blobdload.aspx?BlobID=10337, accessed June 30, 2014.

Planning Commission 2012b—City of El Segundo. Notice of Public Hearing Regarding Environmental Assessment No. EA-958 and Subdivision SUB No. 12-01. June 14. Electronic document, http://www.elsegundo.org/civicax/filebank/blobdload.aspx?BlobID=9815, accessed June 30, 2014.

Planning Commission 2012c—City of El Segundo. Planning Commission Meeting Special Action Report. Electronic document, http://www.elsegundo.org/civicax/filebank/blobdload.aspx?BlobID=10288, accessed July 8, 2014.

Planning Commission 2013a—City of El Segundo. Agenda, 08/15/13 Planning Commission Special Meeting. August 8. Electronic document, http://www.elsegundo.org/civicax/filebank/blobdload.aspx?BlobID=11029, accessed June 30, 2014.

Planning Commission 2013b—City of El Segundo. Planning Commission Meeting Action Report. February 14. Electronic document, http://www.elsegundo.org/civicax/filebank/blobdload.aspx?BlobID=10507, accessed July 9, 2014.

Planning Department 2009—Planning and Building Safety Department. Notice of Public Hearing Regarding Environmental Assessment No. EA-781 and Subdivision No. 07-09. January 22. Planning Division, city of El Segundo, CA. Electronic document, http://www.elsegundo.org/civicax/filebank/blobdload.aspx?BlobID=5985, accessed June 30, 2014.

Planning Department 2012—Planning and Building Safety Department. Notice of Public Hearing Regarding Environmental Assessment No. EA-959, General Plan Amendment GPA 12-01, Specific Plan Amendment SPA 12-01, Zone Change ZC 12-01, Zone Text Amendment ZTA 12-01, Development Agreement DA 12-01, Subdivision SUB 12-02, and Site Plan Review No. SPR 12-01. August 7. Planning Division, city of El Segundo, CA. Electronic document, http://www.elsegundo.org/civicax/filebank/blobdload.aspx?BlobID=9924, accessed June 30, 2014.

Planning Department 2013a—Planning and Building Safety Department. Notice of Public Hearing Regarding Environmental Assessment No. EA-1038, Subdivision No. SUB 13-08 (Vesting Tentative Parcel Map No. 72084) and Adjustment ADJ No. 13-06. November 14. Planning Division, city of El Segundo, CA. Electronic document, http://www.elsegundo.org/civicax/filebank/blobdload.aspx?BlobID=11231, accessed June 30, 2014.

Planning Department 2013b—Planning and Building Safety Department. Notice of Public Hearing Regarding Environmental Assessment No. EA-1014 and Subdivision SUB No. 13-01. May 23. Planning Division, city of El Segundo, CA. Electronic document, http://www.elsegundo.org/civicax/filebank/blobdload.aspx?BlobID=10712, accessed June 30, 2014.

Power 2011—Power Engineers. *Scattergood Generating Station Unit 3 Repowering Project: Cultural Resource Survey Report city of Los Angeles, Los Angeles County, California*. June. Anaheim, CA. Project No. 121680. Prepared for Los Angeles Department of Water and Power, Los Angeles.

Racer 1939a—F. H. Racer. Camp Sites in Harbor District. April. Lomita, CA. On file, South Central Coastal Information Center, California Historical Resources Information System, Fullerton. Study LA-11482.

Racer 1939b—F. H. Racer. Archaeological Site Survey Record for CA-LAn-88/P-19-000088. April. Lomita, CA. On file, South Central Coastal Information Center, California Historical Resources Information System, Fullerton.

Raschke et al. 1995—Rod Raschke, Carol Stadum, and Ronald M. Bissell. *Paleontological and Archaeolgical Resources Reconnaissance of the Los*

Angeles International Airport (LAX) Property, Los Angeles County, California. August. RMW Paleo Associates, Mission Viejo, CA. Project No. 95-1033. Prepared for Planning Consultants Research, Santa Monica, CA. On file, South Central Coastal Information Center, California Historical Resources Information System, Fullerton.

RBF 2010—RBF Consulting. *Addendum to Mitigated Negative Declaration (SCH# 2008081036) for Environmental Assessment No. 844*. March. Irvine, CA. JN 10-107285. Prepared for Planning and Building Safety Department, city of El Segundo, CA. Electronic document, http://www.elsegundo.org/civicax/filebank/blobdload.aspx?BlobID=7534, accessed July 3, 2014.

RBF 2012a—RBF Consulting. *Initial Study/Environmental Checklist, El Segundo South Campus Specific Plan (Specific Plan No. 11-01)*. October 26. Irvine, CA. Prepared for Planning and Building Safety Department, city of El Segundo, CA. Electronic document, http://www.elsegundo.org/civicax/filebank/blobdload.aspx?BlobID=10221, accessed July 3, 2014.

RBF 2012b—RBF Consulting. *Public Review Draft Initial Study/Mitigated Negative Declaration: T5 Data Center Expansion Project (EA 971), 444 North Nash Street*. December 3. Irvine, CA. JN 10-108733. Prepared for Planning and Business Safety Department, city of El Segundo, CA. Electronic document, http://www.elsegundo.org/civicax/filebank/blobdload.aspx?BlobID=10304, accessed July 10, 2014.

RBF 2013a—RBF Consulting. *Public Review Draft Initial Study/Mitigated Negative Declaration, Chevron El Segundo Refinery Central Reliability Center and Central Tool Room/Instrument and Electric Shop (EA 974)*. February 15. Irvine, CA. JN 10-108736. Prepared for Planning and Building Safety Department, city of El Segundo, CA. Electronic document, http://www.elsegundo.org/civicax/filebank/blobdload.aspx?BlobID=10500, accessed June 30, 2014.

RBF 2013b—RBF Consulting. *Final Initial Study/Mitigated Negative Declaration, Queen Esther Square Shopping Center Project (EA 912, CUP 11-02, and ADJ 11-01), 600-630 North Sepulveda Boulevard*. May 13. SCH No. 2013031058. Irvine, CA. JN 10-108518. Prepared for Planning and Building Safety Department, city of El Segundo, CA. Electronic document, http://www.elsegundo.org/civicax/filebank/blobdload.aspx?BlobID=10773, accessed July 2, 2014.

Redondo 2010—City of Redondo Beach. *Initial Environmental Study for Marine Avenue Hotels and RV Storage*. Redondo Beach, CA. Initial Environmental Study No. 2010 0- 5-IE S N- D 0-04.

Richards 2009—Michael D. Richards. *A Report of the Monitoring of the Trench Excavation, Light Grading, and Planting for the Imperial Highway Stormwater Best Practices Management Project, near the Los Angeles International Airport*

(LAX), in the City of Los Angeles, Los Angeles County, California. October. ASM Affiliates, Carlsbad, CA. PN 15610. Prepared for Park West Landscape, Pacoima, CA. On file, South Central Coastal Information Center, California Historical Resources Information System, Fullerton. Study LA-09925.

Ricondo 2014—Ricondo and Associates. *Draft Environmental Assessment: Proposed Runway 6L-24R and Runway 6R-24L Runway Safety Area (RSA) and Associated Improvements Project (Runway Safety Area Improvements of Runway 6L-24R and Runway 6R-24L and Pavement Recopnstruction of Portions of Runway 6L-24R and Taxiway AA), Los Angeles International Airport, Los Angeles, Los Angeles County, California*. May. Prepared for Los Angeles World Airports, city of Los Angeles, and Federal Aviation Administration, U.S. Department of Transportation.

Romani 1976—John F. Romani. *Archaeological Impact Statement: Development of the Hyperion Treatment Plant Secondary Facility W.O. 31225. Located at 12000 Vista Del Mar, Playa Del Rey*. June 7. Northridge Archaeological Research Center, California State University, Northridge. On file, South Central Coastal Information Center, California Historical Resources Information System, Fullerton. Study LA-03494.

Romani 1982—John F. Romani. *Archaeological Survey Report for the 07-LA-110 Harbor Freeway Transitway Corridor Project (P.M. 0.9/23.0) 07840 – 444301*. January 4. District 07, Caltrans, Los Angeles. On file, South Central Coastal Information Center, California Historical Resources Information System, Fullerton. Study LA-05331.

Romer 1959—Margaret Romer. The Last of the Canalinos*. The Historical Society of Southern California Quarterly* 41:241–246.

Rondeau et al. 2007—Michael F. Rondeau, Jim Cassidy, and Terry L. Jones. Colonization Technologies: Fluted Projectile Points and the San Clemente Island Woodworking/Microblade Complex. Chapter 5 in *California Prehistory: Colonization, Culture, and Complexity*, edited by Terry L. Jones and Kathryn A. Klar, pp. 63–70. Lanham, MD: AltaMira.

Rozaire 1951a—Rozaire. Archeological Survey of Southern California Record Card for LAn-88/Miscellaneous Site 1. February. CA. On file, South Central Coastal Information Center, California Historical Resources Information System, Fullerton.

Rozaire 1951b—Rozaire. Archeological Survey of Southern California Record Card for LAn-102 [CA-LAN-88]/Site 14. February. On file, South Central Coastal Information Center, California Historical Resources Information System, Fullerton.

SAIC 2000—Science Applications International Corporation. *Phase I Archaeological Survey along Onshore Portions of the Global West Fiber Optic Cable Project*. April. Santa Barbara, CA. Prepared for Global Photon Systems. On file, South Central Coastal Information Center, California Historical Resources Information System, Fullerton. Study LA-04836.

Sapphos 2013—Sapphos Environmental. *LAX Midfield Satellite Concourse Project: Cultural Resources Technical Report*. March 5. Sapphos Environmental, Pasadena, CA. Prepared for Ricondo & Associates, Chicago. On file, South Central Coastal Information Center, California Historical Resources Information System, Fullerton. Study LA-12267.

Sapphos 2014—Sapphos Environmental. *Proposed Runway 6L-24R and 6R-24L Safety Area and Associated Improvements Project, Cultural Resources Technical Report*. January 23. Pasadena, CA. Prepared for Los Angeles World Airports, city of Los Angeles, and Federal Aviation Administration, U.S. Department of Transportation. Submitted to Ricondo & Associates, Chicago. Appendix E to *Draft Environmental Impact Report (Draft EIR) for Los Angeles International Airport (LAX) Runway 6L-24R and 6R-24L Safety Area and Associated Improvements Project, Volume 1: Main Report*, by Los Angeles World Airports, city of Los Angeles. May.

San Diego History Center 2012—San Diego History Center. Timeline of San Diego History. Electronic document, http://www.sandiegohistory.org/timeline/timeline.htm, Accessed January 22, 2014.

Schoenherr 1992—Allan A. Schoenherr. *A Natural History of California*. California Natural History Guides 56. Berkeley: University of California.

Schroth 1981—Adella Schroth. *Archaeological Resources Assessment of Replacement Bus Operations and Maintenance Facility for Division 18 in the City of Carson, California*. Archaeological Resource Management Corp. On file, South Central Coastal Information Center, California Historical Resources Information System, Fullerton. Study LA-01016.

Schwartz and Vellanoweth 2013—Steven J. Schwartz and René L. Vellanoweth. Lone Woman's Cave Found on San Nicolas Island. *California Archaeology* 5:391–393.

Sherfy and Luce 1998—Marcella Sherfy and W. Ray Luce. *National Register Bulletin: Guidelines for Evaluating and Nominating Properties that Have Achieved Significance within the Past Fifty Years*. Revised. Washington, D.C.: National Park Service, U.S. Department of the Interior. Electronic document, http://www.nps.gov/history/nr/publications/bulletins/nrb22/, accessed January 24, 2014.

Smith 2000—Philomene C. Smith. *Negative Archaeological Survey Report: to Cold Plane the Existing Pavement on Route 405 and Overlay with 30mm of Rubberized Asphalt Concrete at Selected On/Off-Ramps from Vermont Avenue to Manchester Boulevard*. August 3. District 7, California Department of Transportation. On file, South Central Coastal Information Center, California Historical Resources Information System, Fullerton. Study LA-05499.

Steiner 1999—H. Steiner. *The Old Spanish Trail across the Mojave Desert.* Las Vegas: The Haldor Company.

Stickel 1993—E. Gary Stickel. *Draft Report: A Phase I Cultural Resources Literature Search for the West Basin Water Reclamation Project*. April 30. Environmental Research Archaeologists: A Scientific Consortium, Los Angeles. Prepared for West Basin Municipal Water District, Carson, CA. On file, South Central Coastal Information Center, California Historical Resources Information System, Fullerton. Study LA-02904.

Sutton 2010—Mark Q. Sutton. A Reevaluation of Early Northern Uto-Aztecan Prehistory in Alta California. *California Archaeology* 2:3–30.

SWCA 2006—SWCA Environmental Consultants. *Cultural Resources Final Report of Monitoring and Findings for the Qwest Network Construction Project, State of California*. December. Sacramento, CA. SWCA Project No. 10715-180. SWCA Cultural Resources Report Database No. 06-507. Prepared for Qwest Communications, Denver, CO. On file, South Central Coastal Information Center, California Historical Resources Information System, Fullerton. Study Nos. LA-08255, VE-02504, OR-03373.

The Gabrielino/Tongva Tribe n.d.a—The Gabrielino/Tongva Tribe of the Los Angeles Basin. The Gabrielino/Tongva Tribe of the Los Angeles Basin Home Page. Electronic document, http://www.tongvatribe.net, accessed February 5, 2014.

The Gabrielino/Tongva Tribe n.d.b—The Gabrielino/Tongva Tribe of the Los Angeles Basin. Peo'tskome (Tribal Council) Elections. The Gabrielino/Tongva Tribe of the Los Angeles Basin Website. Electronic document, http://www.tongvatribe.net/09elections.html, accessed February 5, 2014.

Tomes 2004—Angel Tomes. *Historical Architectural Evaluation of Fire Station No. 79, City of Los Angeles, Los Angeles County, California*. EDAW. On file, South Central Coastal Information Center, California Historical Resources Information System, Fullerton. Study LA-07898.

TCP|DC&E 2013—The Planning Center|DC&E. *Wiseburn High School Environmental Impact Report: Findings of Fact*. March. Santa Ana, CA. WISE-02.0E. Prepared for Wiseburn School District, Hawthorne, CA. Electronic document, http://wiseburn.k12.ca.us/new/Wiseburn%20High%20School/Wiseburn%20Findings%20of%20Fact%203-22-13.pdf, accessed July 11, 2014.

URS 2012—URS Corporation. *Cultural Resources Evaluation Report: Proposed Runway 7L/25R Runway Safety Area (RSA) and Associated Improvements Project (Pavement Reconstructions of Portions of Runway 7L/25R and Taxiway B, Easterly Extension of Taxiway C, Demolition of Air Freight Building No. 8, and Replacment Ground Support Equipment Facility), Los Angeles International Airport, Los Angeles, Los Angeles County, California*. September. Los Angeles. Prepared for Los Angeles World Airports, city of Los Angeles, and Federal Aviation Administration, U.S. Department of Transportation. Appendix E1 to *Draft Environmental Impact Report (Draft EIR) for Los Angeles International Airport (LAX), Runway 7L/25R Runway Safety Area (RSA) and Associated Improvements Project (Runway Safety Area Improvements and Pavement*

Reconstruction of Runway 7L/25R, Taxiway B, and Apron West of Air Freight Building No. 8), Volume 1: Main Document, by Los Angeles World Airports. September 2013. city of Los Angeles. State Clearinghouse No. 2012101019.

URS 2013—URS Corporation. *Supplemental Cultural Resources Evaluation Report: Proposed Runway 7L/25R Runway Safety Area (RSA) and Associated Improvements Project (RSA Improvements and Pavement Reconstructions of Portions of Runway 7L/25R and Taxiway B), Los Angeles International Airport, Los Angeles, Los Angeles County, California*. May. Los Angeles. Appendix E2 to *Draft Environmental Impact Report (Draft EIR) for Los Angeles International Airport (LAX), Runway 7L/25R Runway Safety Area (RSA) and Associated Improvements Project (Runway Safety Area Improvements and Pavement Reconstruction of Runway 7L/25R, Taxiway B, and Apron West of Air Freight Building No. 8), Volume 1: Main Document*, by Los Angeles World Airports. September 2013. city of Los Angeles. State Clearinghouse No. 2012101019.

USGS 1896—U.S. Geological Survey. Redondo Sheet. 15-Minute Topographic Quadrangle. Surveyed in 1894. On file, South Central Coastal Information Center, California Historical Resources Information System, Fullerton.

Vellanoweth and Grenda 2002—René L. Vellanoweth and Donn R. Grenda. Paradise or Purgatory: Environments, Past and Present. In *Islanders and Mainlanders: Prehistoric Context for the Southern California Bight*, edited by Jeffrey H. Altschul and Donn R. Grenda, pp. 67–84. Tucson, AZ: SRI.

Villalobos 2002—Ruth B. Villalobos. Letter Regarding West Basin Municipal Water District Harbor/South Bay Water Recycling Project. December 6. Environmental Resources Branch, Los Angeles District, Corps of Engineers, Department of the Army, Los Angeles. On file, South Central Coastal Information Center, California Historical Resources Information System, Fullerton. Study LA-11150.

Wesson et al. 2000—Alex Wesson, Bryon Bass, and Brian Hatoff. *El Segundo Power Redevelopment Project, Cultural Resources (Archaeological Resources)*. December. URS Corporation, Oakland, CA. 66-00000030.01 01070. Prepared for California Energy Commission, Sacramento. Confidential report on file, Cultural Resources Unit, California Energy Commission, Sacramento. Dockets No. 00-AFC-14.

West et al. 2007—G. James West, Wallace Woolfenden, James A. Wankett, and R. Scott Anderson. Late Pleistocene and Holocene Environments. Chapter 2 in *California Prehistory: Colonization, Culture, and Complexity*, edited by Terry L. Jones and Kathryn A. Klar, pp. 11–34. Lanham, MD: AltaMira.

White 2002—Laura S. White. Letter Regarding Records Search Results for the Carson Town Center Project EDA Grant, city of Carson, Los Angeles County, California. April 15. Archaeological Associates. Prepared for UltraSystems Environmental, Irvine, CA. On file, South Central Coastal Information Center, California Historical Resources Information System, Fullerton. Study LA-06194.

White 2009—Laura S. White. Cultural Resources Records Search and Site Visit Results for T-Mobile USA Facility 33654C (Richmond Elementary), city of El

Segundo, Los Angeles County, California. Archaeological Associates. On file, South Central Coastal Information Center, California Historical Resources Information System, Fullerton. Study LA-10622.

White 2012a—Laura S. White. Letter Regarding NRG El Segundo Repowering Project: Cultural Resources Weekly Monitoring Report, December 26 through 30, 2011. January 2. John Minch and Associates, Mission Viejo, CA. Prepared for NRG Energy, West, Carlsbad, CA. On file, Compliance Office, California Energy Commission, Sacramento. 00-AFC-14C.

White 2012b—Laura S. White. Letter Regarding NRG El Segundo Repowering Project: Cultural Resources Weekly Monitoring Report, February 20 through 24, 2012. February 27. John Minch and Associates, Mission Viejo, CA. Prepared for NRG Energy, West, Carlsbad, CA. On file, Compliance Office, California Energy Commission, Sacramento. 00-AFC-14C.

White and White 2007—Laura S. White and Robert S. White. *A Phase I Cultural Resources Assessment of a 10.11 Acre Parcel Located at 777 W. 190th Street, City of Los Angeles, County of Los Angeles*. June 25. John Minch and Associates, Mission Viejo, CA. Prepared for Shaw Environmental & Insrfastructure, Irvine, CA. On file, Dockets Unit, California Energy Commission, Sacramento. TN 20422.

White et al. 2008—Laura S. White, Robert S. White, and David M. Van Horn. *El Segundo Power Redevelopment Project, Cultural Resources Monitoring and Mitigation Plan (CRMMP)*. Final. September. John Minch and Associates, Mission Viejo, CA. Prepared for California Energy Commission, Sacramento. On file, Cultural Resources Unit, California Energy Commission, Sacramento.

White et al. 2014—Laura S. White, Robert S. White, David M. Van Horn, Jessica F. Colston, and Richard Guttenberg. *Cultural Resource Monitoring Report for the El Segundo Energy Center Project, El Segundo, California*. Confidential. February 28. John Minch and Associates, Mission Viejo, CA. Prepared for El Segundo Energy Center, El Segundo, CA. On file, Dockets Unit, California Energy Commission, Sacramento. TN 201821.

White and White 2011a—Robert S. White and Laura S. White. *NRG El Segundo Repowering Project: Cultural Resources Mitigation Monitoring Report for the Month of June, 2011*. July 10. John Minch and Associates, Mission Viejo, CA. Prepared for NRG Energy, West, Carlsbad, CA. Submitted to Compliance Office, California Energy Commission, Sacramento. 00-AFC-14C.

White and White 2011b—Robert S. White and Laura S. White. *NRG El Segundo Repowering Project: Cultural Resources Mitigation Monitoring Report for the Month of April, 2011*. May 6. John Minch and Associates, Mission Viejo, CA. Prepared for NRG Energy, West, Carlsbad, CA. Submitted to Compliance Office, California Energy Commission, Sacramento. 00-AFC-14C.

White and White 2011c—Robert S. White and Laura S. White. *NRG El Segundo Repowering Project: Cultural Resources Mitigation Monitoring Report for the Month of August 2011*. September 4. John Minch and Associates, Mission Viejo,

CA. Prepared for NRG Energy, West, Carlsbad, CA. Submitted to Compliance Office, California Energy Commission, Sacramento. 00-AFC-14C.

White and White 2011d—Robert S. White and Laura S. White. *NRG El Segundo Repowering Project: Cultural Resources Mitigation Monitoring Report for the Month of July 2011*. August 7. John Minch and Associates, Mission Viejo, CA. Prepared for NRG Energy, West, Carlsbad, CA. Submitted to Compliance Office, California Energy Commission, Sacramento. 00-AFC-14C.

White and White 2011e—Robert S. White and Laura S. White. *NRG El Segundo Repowering Project: Cultural Resources Mitigation Monitoring Report for the Month of February, 2011*. March 4. John Minch and Associates, Mission Viejo, CA. Prepared for NRG Energy, West, Carlsbad, CA. Submitted to Compliance Office, California Energy Commission, Sacramento. 00-AFC-14C.

White and White 2012a—Robert S. White and Laura S. White. *NRG El Segundo Repowering Project: Cultural Resources Mitigation Monitoring Report for the Month of December, 2011*. January 9. John Minch and Associates, Mission Viejo, CA. Prepared for NRG Energy, West, Carlsbad, CA. Submitted to Compliance Office, California Energy Commission, Sacramento. 00-AFC-14C.

White and White 2012b—Robert S. White and Laura S. White. *NRG El Segundo Repowering Project: Cultural Resources Mitigation Monitoring Report for the Month of February, 2012*. March 9. John Minch and Associates, Mission Viejo, CA. Prepared for NRG Energy, West, Carlsbad, CA. Submitted to Compliance Office, California Energy Commission, Sacramento. 00-AFC-14C.

White and White 2012c—Robert S. White and Laura S. White. *NRG El Segundo Repowering Project: Cultural Resources Mitigation Monitoring Report for the Month of July, 2012*. August 10. John Minch and Associates, Mission Viejo, CA. Prepared for NRG Energy, West, Carlsbad, CA. Submitted to Compliance Office, California Energy Commission, Sacramento. 00-AFC-14C.

White and White 2012d—Robert S. White and Laura S. White. *NRG El Segundo Repowering Project: Cultural Resources Mitigation Monitoring Report for the Month of May, 2012*. June 7. John Minch and Associates, Mission Viejo, CA. Prepared for NRG Energy, West, Carlsbad, CA. Submitted to Compliance Office, California Energy Commission, Sacramento. 00-AFC-14C.

White and White 2012e—Robert S. White and Laura S. White. *NRG El Segundo Repowering Project: Cultural Resources Mitigation Monitoring Report for the Month of April 2012*. May 7. John Minch and Associates, Mission Viejo, CA. Prepared for NRG Energy, West, Carlsbad, CA. Submitted to Compliance Office, California Energy Commission, Sacramento. 00-AFC-14C.

Wlodarksi 1986—Robert J. Wlodarski. *Negative Archaeological Survey Report for 07-LA-1 23.4/25.2*. Prepared for California Department of Transportation. On file, South Central Coastal Information Center, California Historical Resources Information System, Fullerton. Study LA-01543.

Wlodarski 1987—Robert J. Wlodarski. *Negative Archaeological Survey Report for Areas Relating to the North Outfall Replacement Sewer Project, Los Angeles County, California*. June 5. Historical, Environmental, Archaeological, Research, Team, Chatsworth, CA. Prepared for Myra L. Frank & Associates, Los Angeles. On file, South Central Coastal Information Center, California Historical Resources Information System, Fullerton. Study LA-00309.

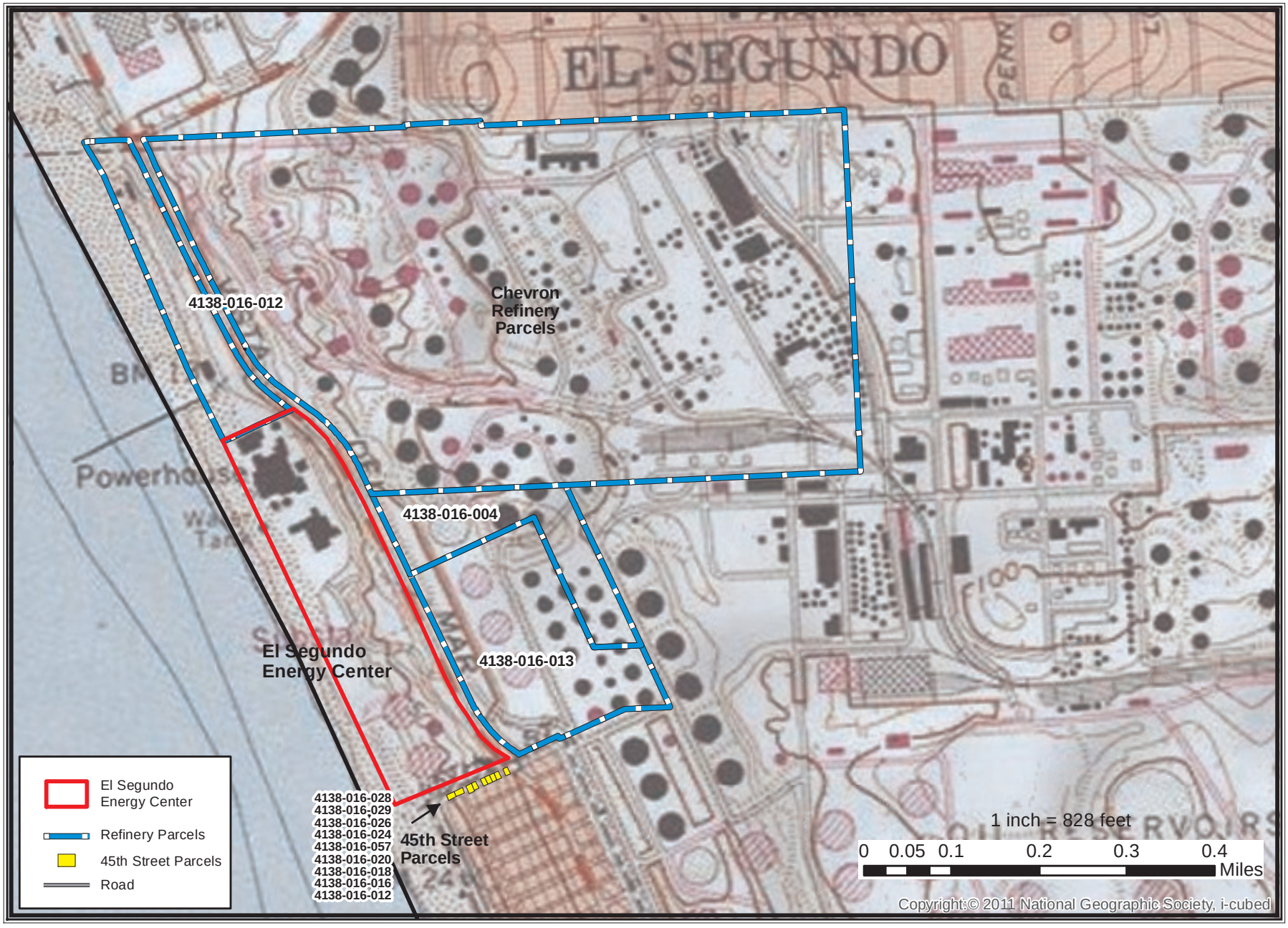
Wlodarski 2009—Robert Wlodarski. Proposed Bechtel Wireless Communications Site LA1040, located at 2727 Glendora Avenue, Manhattan Beach, Los Angeles County, CA. C.A.R.E. On file, South Central Coastal Information Center, California Historical Resources Information System, Fullerton. Study LA-10369.

Wlodarski 2010—Robert Wlodarski. *A Phase I Archaeological Study for the Sage Park Apartments Project, W. 177th Street, S. Building Avenue, Normandie Avenue and Gardena High School, City of Gardena, County of Los Angeles, California*. H.E.A.R.T. On file, South Central Coastal Information Center, California Historical Resources Information System, Fullerton. Study LA-10438.

Woodward 1987—Jim Woodward. *Archaeological Survey of Manhattan State Beach, Los Angeles County, CA*. January. Cultural Heritage Section, Resource Protection Dvision, California Department of Parks and Recreation, Sacramento. Prepared for Department of Beaches and Harbors, County of Los Angeles, Marina del Rey, CA. On file, South Central Coastal Information Center, California Historical Resources Information System, Fullerton. Study LA-01625.

CULTURAL RESOURCES - FIGURE 1

El Segundo Energy Center - Built Environmental Resources of Historic Age within One Parcel Buffer of Project.



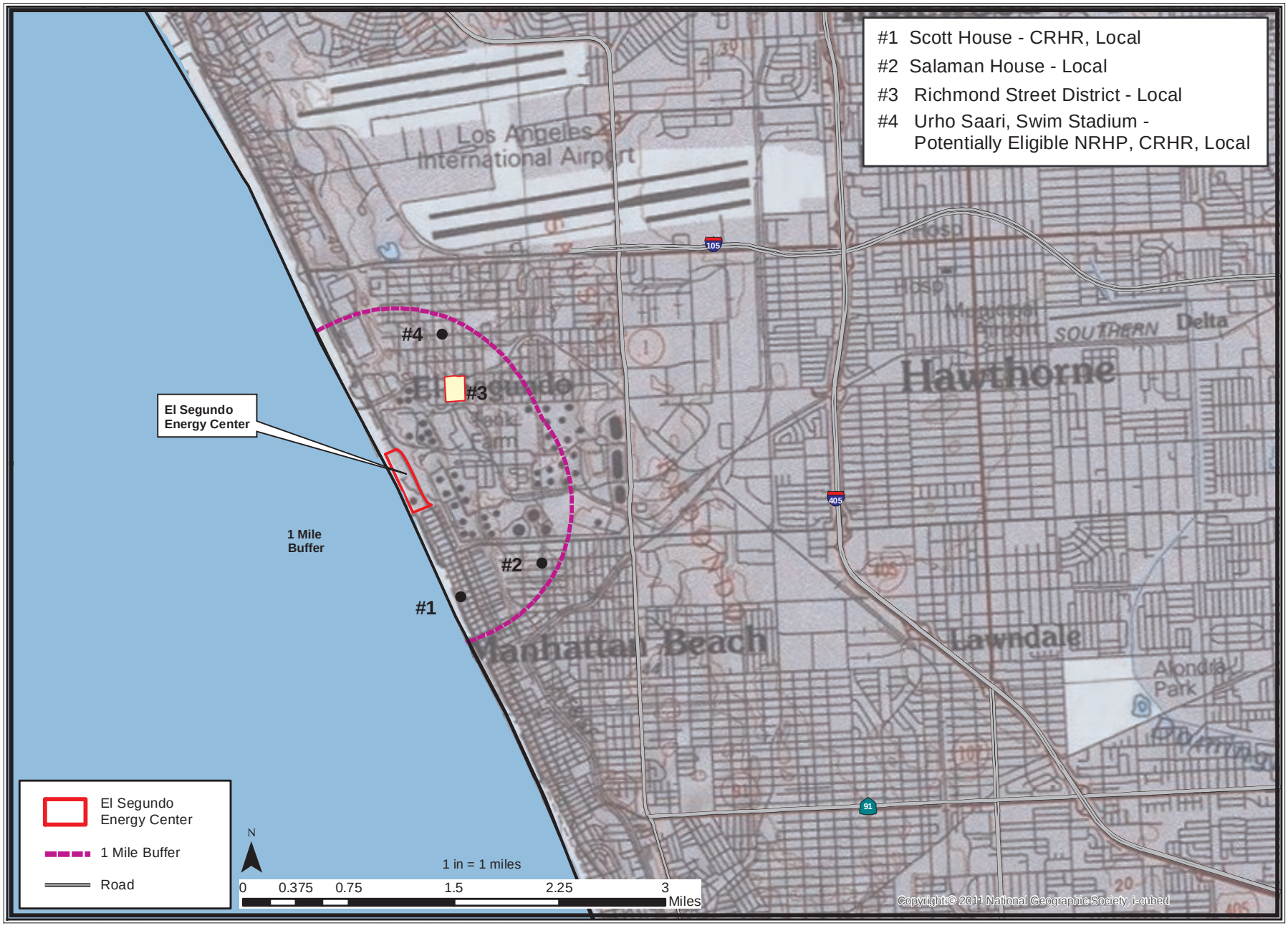
CULTURAL RESOURCES

CALIFORNIA ENERGY COMMISSION, SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCE: ARC GIS Topographic Imagery

CULTURAL RESOURCES - FIGURE 2

El Segundo Energy Center - Built Environmental Resources Listed or Eligible for Listing within Vicinity of Project.



CULTURAL RESOURCES

CALIFORNIA ENERGY COMMISSION, SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCE: Open Street Map

HAZARDOUS MATERIALS MANAGEMENT

Testimony of Alvin Greenberg, Ph.D.

SUMMARY OF CONCLUSIONS

California Energy Commission (Energy Commission) staff evaluated El Segundo Energy Center, LLC's (ESEC LLC) petition for the proposed El Segundo Power Facility Modification (ESPFM) to the licensed El Segundo Energy Center (ESEC) project (amendment dated April 23, 2013; NRG 2013a) in terms of hazardous materials use. In the period since the original licensing of this project in 2000, a Petition to Amend (PTA) was filed in 2005, a staff assessment to that PTA was filed in 2005, a Decision was filed in 2005 (CEC 2005a), a second PTA was filed in 2007, a staff assessment to that PTA was published in 2008, a PTA Supplement to expand the scope of the 2007 PTA was filed in 2010, and a Decision was adopted in 2010 (CEC 2010a). Another PTA was filed in 2012, requesting to modify the ammonia injection rates, eliminate a venturi scrubber, eliminate the ammonia supply pipeline from Chevron, and change the project name to the El Segundo Energy Center (ESEC). These changes were approved by the Energy Commission on August 9, 2012. Because of the substantial and numerous modifications made to this power plant over the past 10 years, the changes to hazardous materials use, locations, and laws, ordinances, regulations, and standards (LORS), and errors in the April 2013 PTA regarding hazardous materials use and storage, staff decided to conduct what is essentially a *de novo* analysis of hazardous materials use proposed for the modified project.

Additionally, as per LORS requirements, the project owner would be required to update their Risk Management Plan (RMP) for the storage and use of aqueous ammonia and prepare a Spill Prevention, Control, and Countermeasures Plan (SPCC Plan) and Safety Management Plan (SMP). To ensure the adequacy of these plans, a modification to existing Condition of Certification **HAZ-2** is proposed to include all three plans and that they be submitted for concurrent review by the city of El Segundo Fire Department (CESFD) Environmental Safety Division and Energy Commission staff.

This Final Staff Assessment (FSA) indicates that with the implementation of staff's proposed mitigation measures, hazardous materials use at the modified project site would not present a potential for significant impact to the public. Staff proposes six (6) new or revised existing Hazardous Materials Conditions of Certification to address the safe handling of hazardous materials and site security. With adoption of the proposed conditions of certification, the ESPFM project will comply with all applicable LORS and will not result in any unmitigated significant adverse impacts.

INTRODUCTION

On April 23, 2013, ESEC LLC, filed a PTA with the Energy Commission requesting to replace utility boiler El Segundo Generating Station (ESGS) Units 3 and 4 with one new combined cycle (consisting of a combustion turbine generator (Unit 9), and one steam turbine generator (Unit 10)) and two simple-cycle combustion turbines (Units 11 and 12) for the ESEC project totaling 449 megawatts (MW) (NRG 2013a). The current

amendment proposes the demolition of the existing steam boiler Units 3 and 4, to be replaced with combined cycle Units 9 and 10, with dry cooling technology, and simple cycle Units 11 and 12.

The proposed project is located within the existing 33-acre site ESEC power plant. The site is located at the southernmost city limit of the city of El Segundo on the coast of the Pacific Ocean, between Dockweiler State Beach and the city of Manhattan Beach, in Los Angeles County. See **Project Description Figures 1** and **2.**

The purpose of this hazardous materials management analysis is to determine if the ESPFM has the potential to cause significant impacts to the public as a result of the use, handling, storage, or transportation of hazardous materials at the proposed site. If significant adverse impacts to the public are identified, staff must also evaluate the potential for facility design alternatives and additional mitigation measures to reduce those impacts to the extent feasible.

This analysis does not address the potential exposure of workers to hazardous materials used at the proposed facility. Employers must inform employees of hazards associated with their work and provide them with special protective equipment and training to reduce the potential for health impacts associated with the handling of hazardous materials. The **Worker Safety and Fire Protection** section of this document describes applicable requirements for the protection of workers from these risks.

In this analysis, staff examines plausible potential loss of containment incidents (spills) for the hazardous materials to be used at the proposed facility. The worst case plausible event, regardless of cause, is considered and analyzed to see whether the risk to local populations would be significant. Hazardous material handling and usage procedures are designed to reduce the likelihood of a spill, to reduce its potential size, and to prevent or reduce the potential for impacts of accidental releases off-site. These measures also address the potential for spills to mix with runoff water and be carried offsite. Generally, staff seeks to confirm that the project owner has proposed secondary containment basins for containing liquids, and that volatile chemicals would have restricted movement into the atmosphere after containment.

Various hazardous materials including mineral and lubricating oils, water treatment chemicals, welding gasses, aqueous ammonia (via pipeline), and natural gas will be transported to, stored at, and used at the proposed ESPFM project site. This document addresses all potential impacts associated with the transportation, storage, use, and handling of hazardous materials.

METHODOLOGY AND THRESHOLDS FOR DETERMINING ENVIRONMENTAL CONSEQUENCES

Staff reviewed and assessed the potential for the transportation (including via tanker truck, regular truck, and pipeline), handling, and use of hazardous materials to impact the surrounding community. All chemicals were evaluated. Staff's analysis addresses the potential impacts on all members of the population including the young, the elderly, and people with existing medical conditions that may make them more sensitive to the

adverse effects of hazardous materials. To accomplish this goal, staff utilizes exposure criteria (both acute and chronic) that are protective of the public.

In order to assess the potential for released hazardous materials to travel off site and affect the public, staff analyzed several aspects of the proposed use of these materials at the facility. Staff recognizes that some hazardous materials must be used at power plants. Therefore, staff conducted its analysis by examining the choice and amount of chemicals to be used, the manner in which the project owner will use the chemicals, the manner by which they will be transported to the facility and transferred to facility storage tanks, and the way the project owner plans to store the materials on site.

Staff reviewed the project owner's proposed engineering and administrative controls concerning hazardous materials usage. Engineering controls are the physical or mechanical systems, such as storage tanks or automatic shut-off valves, that can prevent the spill of hazardous material from occurring, or which can either limit the spill to a small amount or confine it to a small area. Administrative controls are procedures that will serve to prevent accidents and reduce the potential for impact if they do occur. Both engineering and administrative controls can act to prevent or minimize the need for emergency response actions.

Staff reviewed and evaluated the project owner's proposed use of hazardous materials as described by the project owner in its PTA (NRG 2013a). Staff's assessment followed the five steps listed below:

- **Step 1**: Staff reviewed the chemicals and the amounts proposed for on-site use as listed in Table 2-14 of the PTA (NRG 2013a) and determined the need and appropriateness of their use.
- **Step 2**: Those chemicals proposed for use in small amounts or whose physical state is such that there is virtually no chance that a spill would migrate off site and impact the public were removed from further assessment.
- **Step 3**: Measures proposed by the project owner to prevent spills were reviewed and evaluated. These included engineering controls such as automatic shut-off valves and different-sized transfer-hose couplings and administrative controls such as worker training and safety management programs.
- **Step 4**: Measures proposed by the project owner to respond to accidents were reviewed and evaluated. These measures also included engineering controls such as catchment basins and methods to keep vapors from spreading and administrative controls such as training emergency response crews.
- **Step 5**: Staff analyzed the theoretical impacts on the public of a worst-case spill of hazardous materials, as reduced by the mitigation measures proposed by the project owner. When mitigation methods proposed by the project owner are sufficient, no further mitigation is recommended. If the proposed mitigation is not sufficient to reduce the potential for adverse impacts to an insignificant level, staff will propose additional prevention and response controls until the potential for

causing harm to the public is reduced to an insignificant level. It is only at this point that staff can recommend that the facility be allowed to use hazardous materials.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS (LORS)

The following federal, state, and local laws and policies apply to the protection of public health and hazardous materials management. Staff's analysis examines the project's compliance with these requirements.

Hazardous Materials Management Table 1
Laws, Ordinances, Regulations, and Standards (LORS)

Applicable LORS	Description
Federal	
The Superfund Amendments and Reauthorization Act of 1986 (42 USC §9601 et seq.)	Contains the Emergency Planning and Community Right To Know Act (EPCRA; also known as SARA Title III), which requires a project that stores specified chemicals greater than designated amounts, to inform local communities and first responders with information about the hazards posed so that community response plans can be developed. The requirements of both SARA Title III and the Clean Air Act (CAA) are reflected in the California Health and Safety Code, section 25531, et seq.
The CAA of 1990 (42 USC 7401 et seq. as amended) risk management plans (42 USC §112(r)	Requires a facility that stores specified chemicals greater than designated amounts to prepare a Risk Management Plan (RMP) that characterizes the hazards posed by the chemicals stored, design and maintain a safe facility, includes an Off-site Consequence Analysis (OCA) and identify steps taken to minimize the consequences of accidental releases, submit that plan to the United States Environmental Protection Agency (U.S. EPA) and the local authority, and update the plan when new chemicals or processes are added or every 5 years.
Executive Order 13650 Improving Chemical Safety and Security Aug 1, 2013	This Order directs the federal government to improve safety and reduce risks to workers and communities posed by facilities that use and store hazardous chemicals. A multi-federal agency Working Group will work with states to identify means by which this can be accomplished.
49 CFR 172.800	The U.S. Department of Transportation (DOT) requirement that suppliers of hazardous materials prepare and implement security plans.
49 CFR Part 1572, Subparts A and B	Requires suppliers of hazardous materials to ensure that all their hazardous materials drivers are in compliance with personnel background security checks.
The Clean Water Act (CWA) (40 CFR 112)	Aims to prevent the discharge or threat of discharge of oil into navigable waters or adjoining shorelines. Requires a written Spill Prevention, Control, and Countermeasures (SPCC) plan to be prepared for facilities that store oil that could leak into navigable waters.

Applicable LORS	Description
Federal Register (6 CFR Part 27) interim final rule	A regulation of the U.S. Department of Homeland Security requiring facilities that use or store certain hazardous materials to submit information to the department so that a vulnerability assessment can be conducted to determine what certain specified security measures shall be implemented.
State	
Title 8, California Code of Regulations, section 5189	Requires project owners to develop and implement effective safety management plans that ensure that large quantities of hazardous materials are handled safely. While such requirements primarily provide for the protection of workers, they also indirectly improve public safety and are coordinated with the RMP process.
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."
California Safe Drinking Water and Toxic Enforcement Act (Proposition 65)	Prevents certain chemicals that cause cancer and reproductive toxicity from being discharged into sources of drinking water.
Hazardous Material Business Plan, Cal HSC Sections 25500 to 25541	Requires the submittal of a chemical inventory and planning and reporting for management of hazardous materials.
California Accidental Release Program (CalARP) 19 CCR Sections 2735 to 2785	This is California's equivalent to the Federal RMP program, and similarly, requires a facility that stores specified chemicals greater than designated amounts (those different from the federal program), to prepare a RMP that characterizes the hazards posed by the chemicals stored, design and maintain a safe facility, include an Off-site Consequence Analysis (OCA) and identify steps taken to minimize the consequences of accidental releases, submit that plan to the U.S. EPA and the local Certified Unified Program Authority (CUPA), and update the plan when new chemicals or processes are added, or, every 5 years.
Hazardous Substance Information and Training Act, 8 CCR Section 339; Section 3200 et seq., 5139 et seq.,	Requires listing and implementation of specified control measures for management of hazardous substances.

Applicable LORS	Description
and 5160 et seq.	
California HSC Sections 25270 through 25270.13	Requires the preparation of a Spill Prevention, Control, and Countermeasures (SPCC) Plan if 10,000 gallons or more of petroleum is stored on-site. The above regulations would also require the immediate reporting of a spill or release of 42 gallons or more to the California Office of Emergency Services and the CUPA.
NFPA 56 (adopted 2012)	NFPA 56 is the Standard for Fire and Explosion Prevention During Cleaning and Purging of Flammable Gas Piping Systems.
Local	
city of El Segundo Municipal Code Title 13 Chapter 10: Fire Code	The city of El Segundo Fire Department enforces the 2013 version of the California Fire Code (City Ordinance 1488 adopted Nov. 5, 2013)
city of El Segundo Fire Department, Environmental Safety Division, Municipal Code Title 5 Chapter 5	The city of El Segundo Fire Department (CESFD), Environmental Safety Division is the CUPA and therefore regulates RMPs (Article A) and Underground Storage Tanks (Article B) which govern hazardous materials release response plans, inventories, and storage tanks.

The Certified Unified Program Authority (CUPA) with the responsibility to review the Hazardous Materials Business Plan (HMBP) and RMP, is the city of El Segundo Fire Department (CESFD), Environmental Safety Division. Construction and design of buildings and vessels storing hazardous materials will meet the appropriate seismic requirements of the 2013 California Building Code and the 2013 California Fire Code.

PROPOSED MODIFIED PROJECT

ESEC LLC, a wholly owned subsidiary of NRG Energy, Inc. (NRG), proposes to make substantial changes to the ESEC. Primary changes include the demolition and replacement of two once-through-cooled natural gas-fired utility boiler units (Units 3 and 4), with one new combined cycle generator (Unit 9 combustion turbine and Unit 10 steam turbine generator) and two simple-cycle gas turbines (Units 11 and 12). This change will eliminate the use of ocean water for once-through cooling at the facility. The proposed changes would also upgrade and improve the ESEC's existing and approved site infrastructure, provide fast start and dispatch flexibility capabilities to support Southern California grid load balancing and renewable energy integration, and implement improvements to coastal access. See **Project Description Figures 3**, **4**, **5**, **6**, and **7**.

Specific changes proposed through this PTA include:

- Shutdown and demolition of ESGS Units 3 and 4;
- Removal and remediation of existing ESEC retention basins;

- Construction of a new, combined administration, maintenance, and operations support building;
- Modifications to existing site access; and
- Improvements to beach access.

The following new major equipment would be installed:

- Unit 9 - One fast start combustion turbine in a combined-cycle configuration, rated at 222 MW net, incorporating a General Electric natural gas combustion turbine generator designed to achieve 75 percent of base load output in 10 minutes;
- As part of the combined cycle, one two-pressure, duct-fired heat recovery steam generator (HRSG) designed for rapid startup with conventional selective catalytic reduction system (SCR)/carbon monoxide (CO) catalysts;
- As part of the combined cycle, Unit 10 - One single-case, non-reheat axial exhaust admission condensing steam turbine generator (STG) rated at 112 MW and designed for non-traditional elevated condensing pressure to minimize cooling system size;
- One Heller dry cooling tower system;
- Units 11 and 12 - Two Rolls Royce Trent 60 generators, rated at a nominal 55 MW/unit net, consisting of advanced aeroderivative simple-cycle gas turbines; and
- One Cleaver Brooks auxiliary boiler consisting of a direct contact spray condenser and a mechanically-induced-draft dry-cooling tower.

SETTING AND EXISTING CONDITIONS

Several factors associated with the area in which a project is to be located affect the potential for an accidental release of a hazardous material that could cause public health impacts. These include:

- local meteorology;
- terrain characteristics; and,
- location of population centers and sensitive receptors relative to the project.

METEOROLOGICAL CONDITIONS

Meteorological conditions, including wind speed, wind direction, and air temperature, affect both the extent to which accidentally released hazardous materials would be dispersed into the air and the direction in which they would be transported. This affects the potential magnitude and extent of public exposure to such materials, as well as their associated health risks. When wind speeds are low and the atmosphere stable, dispersion is severely reduced, but can lead to increased localized public exposure.

Recorded wind speeds and ambient air temperatures are described in Appendix C of the PTA (NRG 2013a).

TERRAIN CHARACTERISTICS

The location of elevated terrain is often an important factor in assessing potential exposure. An emission plume resulting from an accidental release may impact high elevations before impacting lower elevations. The topography of the site is mostly flat with elevated terrain beginning to the east and south directly on the other side of the facility fence line (NRG 2013a).

LOCATION OF EXPOSED POPULATIONS AND SENSITIVE RECEPTORS

The general population includes many sensitive subgroups that may be at greater risk from exposure to emitted pollutants. These sensitive subgroups include the very young, the elderly, and those with existing illnesses. In addition, the location of the population in the area surrounding a project site may have a major bearing on health risk. There are sensitive receptors within a 3-mile radius of the project site. The nearest sensitive receptor is the El Segundo High School located about 1.1 miles north by north east of the project site and El Segundo Middle School is located one and one-third miles to the northeast. There are many residences just beyond the facility fence line to the south and within less than ½ mile of the project site north by northeast of the project fence line.

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

SMALL QUANTITY HAZARDOUS MATERIALS

In conducting the analysis, staff determined in Steps 1 and 2 (above), that some hazardous materials, although present at the proposed facility, pose a minimal potential for off-site impacts since they will be stored in a solid form or in smaller quantities, have low mobility, or have low levels of toxicity. These hazardous materials, which were eliminated from further consideration, are briefly discussed below.

During the construction phase of the project, hazardous materials proposed for use include the same type and amount as in the approved ESEC project. These include paint, solvents, gasoline, diesel fuel, motor oil, lubricants, and welding gases (Table 2-14, NRG 2013a). No acutely toxic hazardous materials will be used on site during construction for construction, and none of these materials pose significant potential for off-site impacts as a result of the quantities on site, their relative toxicity, their physical state, and/or their environmental mobility. Any impact of spills or other releases of these materials will be limited to the site because of the small quantities involved, their infrequent use (and therefore reduced chances of release), and/or the temporary containment berms used by contractors. Petroleum hydrocarbon-based motor fuels, mineral oil, lube oil, and diesel fuel are all very low volatility and represent limited off-site hazards even in larger quantities.

During operations, hazardous chemicals such as cleaning agents, water treatment chemicals, welding gasses, oils, and other various chemicals (see **Hazardous Materials Appendix B** for a list of chemicals proposed to be used and stored at ESEC during operations) would be used and stored in relatively small amounts and represent limited off-site hazards because of their small quantities, low volatility, and/or low toxicity. Some hazardous materials, such as Chel Clean 665 Chelating Agent (an aqueous solution of EDTA – Ethylenediaminetetraacetic acid), although present in large amounts (in this case a maximum of 89,000 lbs. stored in a poly tank), the use and handling of EDTA is widespread in the power generation industry and poses no risk of an off-site consequence. On-site workers will be adequately protected from the irritative effects of the chemical and thus no further evaluation was deemed necessary. The same holds true for other large quantity hazardous materials that pose no risk of off-site consequences should a spill occur including 40,500 gallons of lubricating oil stored in an above-ground tank and 88,000 gallons of Mineral Oil stored in transformers on the site. (Note that these two petroleum hydrocarbons pose a risk of spill and fire and spills are addressed by the SPCC Plan while fire protection is addressed in the **Worker Safety and Fire Protection** section of this document**.**)

The modified project will be limited to using, storing, and transporting only those hazardous materials listed in **Appendix B** of this section as per staff's proposed Condition of Certification **HAZ-1**.

After removing from consideration those chemicals that pose no risk of off-site impact in Steps 1 and 2 (above), staff continued with Steps 3, 4, and 5 to review the remaining hazardous materials: natural gas and aqueous ammonia.

LARGE QUANTITY HAZARDOUS MATERIALS

Natural Gas

Natural gas poses a fire and/or possible explosion risk because of its flammability. Natural gas is composed of mostly methane, but also contains ethane, propane, nitrogen, butane, isobutene, and isopentane. It is colorless, odorless, tasteless, and lighter than air. Natural gas can cause asphyxiation when methane is 90 percent in concentration. Methane is flammable when mixed in air at concentrations of 5-14 percent, which is also the detonation range. Natural gas, therefore, poses a risk of fire and/or possible explosion if a release occurs under certain specific conditions. However, it should be noted that, due to its tendency to disperse rapidly, natural gas is less likely to cause explosions than many other fuel gases such as propane or liquefied petroleum gas, but can explode under certain confined conditions (as demonstrated by the natural gas detonation in Belgium in July 2004 and in San Bruno, California in September 2010).

While natural gas will be used in significant quantities, it will not be stored on site. It will continue to be delivered by the Southern California Gas Company (SoCal Gas) via an existing pipeline. The use of existing ESEC natural gas supply pipelines removes the need to modify the SoCal Gas system into or on the site.

The risk of a fire and/or explosion on site can be reduced to insignificant levels through adherence to applicable codes and the development and implementation of effective safety management practices. The National Fire Protection Association (NFPA) code 85A requires both the use of double-block and bleed valves for gas shut off and automated combustion controls. These measures will significantly reduce the likelihood of an explosion in gas-fired equipment. Additionally, start-up procedures would require air purging of the gas turbines prior to start up, thereby precluding the presence of an explosive mixture. The SMP proposed by the project owner would address the handling and use of natural gas, and would significantly reduce the potential for equipment failure because of either improper maintenance or human error.

Staff concludes that existing LORS are sufficient to ensure minimal risks of pipeline failure off-site or on-site.

On June 28, 2010, the United States Chemical Safety and Hazard Board (CSB) issued Urgent Recommendations to the United States Occupational Safety and Health Administration (OSHA), the NFPA, the American Society of Mechanical Engineers (ASME), and major gas turbine manufacturers to make changes to their respective regulations, codes, and guidance to require the use of inherently safer alternatives to natural gas blows for the purposes of pipe cleaning. Recommendations were also made to the fifty states to enact legislation applicable to power plants that prohibits flammable gas blows for the purposes of pipe cleaning. In accordance with those recommendations, staff proposes new Condition of Certification **HAZ-4** which prohibits the use of flammable gas blow for pipe cleaning at the facility either during construction or after the start of operations. All fuel gas pipe purging activities shall vent any gases to a safe location outdoors, away from workers and sources of ignition. Fuel gas pipe cleaning and purging shall adhere to the provisions of NFPA 56, the Standard for Fire and Explosion Prevention During Cleaning and Purging of Flammable Gas Piping Systems, with special emphasis on sections 4.3.1 (written procedures for pipe cleaning and purging) and 6.111 (prohibition on the use of flammable gas for cleaning or purging at any time).

Aqueous Ammonia

Aqueous ammonia will be used to control the emission of oxides of nitrogen (NOx) from the combustion of natural gas at the ESEC and control of boiler water pH.

Aqueous ammonia (29 percent) will be will be delivered via tanker and stored in one 20,000 gallon double walled underground storage tank (UST), while aqueous ammonia (19 percent) will be delivered by truck to fill totes at two locations, one at Unit 5-8 for ESEC and another at Units 9 and 10 for the GE Fast-start combustion turbine. The accidental release of either form of aqueous ammonia at any location on-site without proper mitigation can result in significant down-wind concentrations of ammonia gas.

The 20,000 gallon UST is located near the entrance to the facility and is approximately five (5) feet below grade, with the bottom of the tank located about 20 feet below grade. The UST area is located near the entrance of the plant, is enclosed by a fence, and the pumps and fill valves/pipes are within a bermed area to collect any spilled material. Two pipes currently deliver 29.4 percent aqueous ammonia to the ammonia skids near the

combustion turbines: a 1” diameter pipe and a 2” diameter pipe. Both are double-walled and have leak detection sensors in the space between the two pipe walls.

The top of the UST is capped with concrete; a small driveway leads to the UST area from the plant entrance road and is used for offloading aqueous ammonia during deliveries and accessing for routine inspections/maintenance. No berm or curb encompasses the area where the tanker off-loads the aqueous ammonia. A release at this point during filling would migrate off the pad onto gravel and soil at the perimeter of the pad. The tanker truck connects via a flexible hose to the inlet and to vapor ports and this hose line from the tanker can immediately be manually shut off if a problem or spill occurs. El Segundo Generating Station has been under the oversight of the CUPA for inspections and RMP reviews and updates since this system has been in service (which was pre -licensing of the El Segundo Power Redevelopment Project).

The two ammonia totes (350 gallon capacity each, made of stainless steel and having secondary containment to control spills) storing 19 percent ammonia were installed to provide pH control to Units 6 and 8 boiler feed water. These stainless steel totes were recently manufactured and installed at the site and are currently being commissioned as of the date of this FSA. These totes replaced smaller temporary totes that have supported ESEC during its initial operating months. In the near future, another 350 gallon tote with secondary containment will be installed to support pH control for the GE Fast-Start combined cycle unit.

The use of aqueous ammonia can result in the formation and release of toxic gases in the event of a spill even without interaction with other chemicals. This is a result of its moderate vapor pressure and the volume of aqueous ammonia that will be used and stored on site. However, the use of aqueous ammonia poses far less risk than the use of the far more hazardous anhydrous ammonia (ammonia gas that is not diluted with water).

To assess the potential impacts associated with an accidental release of aqueous ammonia, staff uses four bench mark exposure levels of ammonia gas occurring offsite. These include:

- the lowest concentration posing a risk of lethality of 2,000 ppm;
- the immediately dangerous to life and health level of 300 ppm;
- the emergency response planning guideline level 2 of 150 ppm; and,
- 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 (considered by staff to be a level of significance – see **Appendix A**).

If the potential exposure associated with a potential release exceeds 75 ppm at any public receptor, staff assumes that the potential release poses a risk of significant impact. Staff would then assess the probability of occurrence of the release and/or the nature of the potentially exposed population in determining whether the likelihood and extent of potential exposure are sufficient to support a finding of potentially significant

impact and if so, will propose mitigation to reduce the impact to a level of less than significant.

At this site, several factors influence staff's review and proposed mitigation including the fact that the nearest off-site public receptors are the beach immediately to the west, homes located immediately across the street to the south of the facility fence line (and therefore very near the aqueous ammonia tank location), and traffic on Vista Del Mar Blvd located immediately to the east of the facility fence line and also that the tank storing 29 percent aqueous ammonia is double-walled and below ground (which provides significant mitigation).

A RMP is required by the Cal-ARP Program for the storage and use of large quantities of aqueous ammonia. The current RMP was prepared in January 2013 and assessed a worst-case release scenario of 277 gallons of 29.4 percent ammonia occurring at the lowest point in the aboveground pipeline (i.e., the bottom of the site access road) where it is most likely to result in the greatest volume release and an alternative release scenario of a catastrophic rupture of the Units 3 & 4 Pipeline with two UST supply pumps operating at full capacity [7 gallons per minute (gpm)] and that goes undetected for 15 minutes before the Control Room shuts off the pumps (a highly unlikely scenario) thus resulting in a spill of 435 gallons aqueous ammonia.

Using the RMP*COMP model, a most conservative model that, although allowed by law to be used, staff finds to be very unrealistic and not at all useful for determining the potential for significant risks under California Environmental Quality Act (CEQA), the project owner found that ammonia could reach offsite at significant airborne concentrations (200 ppm or greater) of up to 0.2 miles, an area that would include the beach and Vista Del Mar Blvd. but not the homes to the south. The RMP did not assess the level considered by the Energy Commission staff to be without serious adverse effects on the public for a one-time exposure, 75 ppm but staff requested that the project owner perform such an analysis.

The project owner conducted an Offsite Consequence Analysis (OCA) using the U.S. EPA-approved ALOHA air dispersion model (LL 2014d). Staff reviewed the input variables and reviewed two maps showing the extent of the 75 ppm contour developed for the same two accidental release scenarios included in the January 2013 RMP described above. The results show that similar to the 200 ppm contours, an airborne concentration of 75 ppm would reach off-site onto the beach area, Vista Del Mar Boulevard, the Chevron Refinery property, and would also reach the homes located in a portion of the El Porto residential neighborhood of the city of Manhattan Beach to the south of the power plant.

Staff has considered the potential impact of an ammonia release on motorists driving on Vista Del Mar Boulevard and the public using the beach to the west. Staff believes that since the wind direction is almost always from the west to the east and thus away from the beach, and that motorists driving on Vista Del Mar Boulevard would experience only a fleeting very short-term exposure to ammonia, and that any spill would be rapidly controlled, the impact of an aqueous ammonia spill on drivers or beach-goers, although noticeable by smell, would be less than significant.

However, in reviewing the potential impact on nearby residents, staff decided to conduct its own OCA using ALOHA. First, staff attempted to duplicate the results found by the project owner. Staff was able to do this, and thus verify that impacts could reach into the El Porto residential neighborhood to the south. Staff, however, disagrees that two of the input variables – air temperature and atmospheric stability class -- used by the project owner, were indeed "worst case" meteorological conditions. The project owner assumed a maximum high air temperature of 110° F and stability class C. Although staff was able to confirm that the maximum high temperature recorded for El Segundo was indeed 110° F, staff disagrees that stability class C is an appropriate "worst case" variant. Staff instead conducted a second air dispersion model using a lower air temperature of 70° F and stability class F, a condition that could readily occur in the late evening or early morning in the El Segundo area. The results show that a release of 29.4 percent aqueous ammonia could potentially cause an airborne concentration of 75 ppm far into the nearby El Porto residential area.

Accordingly, staff would normally propose mitigation to reduce this potential impact on the off-site public to a less than significant level. One of the options that staff would propose in a situation such as this would be to require that both the current pipes and any new aqueous ammonia pipes running from the ammonia tank to the ammonia skids near each combustion turbine be double-walled with leak detection in the space between the two walls. But since the project already uses such piping (which staff finds to be the best solution available) and plans to do so in the future as the modified project is constructed and operated, staff finds that the risk of release and resultant off-site consequence to the public is so remote as to be considered less than significant. Therefore, staff does not propose any further mitigation regarding piping except to require that all new piping shall be the same as existing piping, that is, double walled with leak detection in the space between the walls. This proposal can be found in new Condition of Certification **HAZ-6**.

Additionally, staff is proposing that the project owner prepare and implement a Spill Capture Plan that includes procedures and methods to cover, contain, and remove any spilled 29.4 percent or 19 percent aqueous ammonia from the ground, trench, sump, or portable spill container, within a time-frame of not less than 30 minutes. It is proposed that the project owner provide the design drawings and Spill Capture Plan to the Compliance Project Manager (CPM) for review and approval within 30 days of a Decision to approve the amendment and that the plan be implemented within sixty (60) days after receiving approval from the CPM.

The ESEC LLC, would be required to update their plan and develop and implement an SMP for the delivery of liquid and gaseous materials if staff's proposed revision of existing Condition of Certification **HAZ-2** is adopted.

MITIGATION

Staff believes that this project's use of hazardous materials poses a less than significant risk, but only if mitigation measures are used. The potential for accidents resulting in the release of hazardous materials is greatly reduced by the implementation of a Safety Management Program that includes both engineering and administrative controls. Elements of facility controls and the SMP are summarized below.

Engineering Controls

Engineering controls help to prevent accidents and releases (spills) from moving off site and affecting communities by incorporating engineering safety design criteria in the design of the project. The engineered safety features proposed by the project owner for use at the ESEC project include:

- Storage of small quantity hazardous materials in original, properly labeled containers ("totes");
- construction of secondary containment areas surrounding each of the bulk hazardous materials storage areas or totes or the placement of temporary portable containment structures during delivery designed to contain accidental releases that might happen during storage or delivery plus the volume of rainfall associated with a 25-year, 24-hour storm;
- physical separation of stored chemicals in isolated containment areas in order to prevent accidental mixing of incompatible materials, which could result in the evolution and release of toxic gases or fumes; and,
- installation of a fire protection system for hazardous materials storage areas.

Administrative Controls

Administrative controls also help prevent accidents and releases (spills) from moving off site and affecting neighboring communities by establishing worker training programs, process safety management programs, and complying with all applicable health and safety laws, ordinances, and standards.

A worker health and safety program will be prepared by the project owner and include (but not be limited to) the following elements (see the **Worker Safety and Fire Protection** section for specific regulatory requirements):

- worker training regarding chemical hazards, health and safety issues, and hazard communication;
- procedures to ensure the proper use of personal protective equipment;
- safety operating procedures for the operation and maintenance of systems utilizing hazardous materials;
- fire safety and prevention; and,
- emergency response actions including facility evacuation, hazardous material spill clean-up, and fire prevention including the preparation of a SMP for the delivery of liquid and gaseous materials (required by proposed new Condition of Certification **HAZ-3**) and a SPCC Plan (required by proposed revised Condition of Certification **HAZ-2**).

At the ESEC project site, the project owner will be required to designate an individual with the responsibility and authority to ensure a safe and healthful work place. The

project health and safety official will oversee the health and safety program and have the authority to halt any action or modify any work practice to protect the workers, facility, and the surrounding community, in the event of a violation of the health and safety program.

Staff's proposed revision to existing Condition of Certification **HAZ-1** would ensure that no hazardous material would be used at the facility except as listed in **Appendix B** to this Final Staff Assessment. Condition of Certification **HAZ-1** also requires changes to the allowed list of hazardous materials and their maximum amounts to be approved by the Energy Commission Compliance Project Manager (CPM). Only those that are needed and appropriate would be allowed to be used. If staff feels that a safer alternative chemical can be used, staff would recommend or require its use, depending upon the impacts posed.

Additional administrative controls are required by revised Condition of Certification **HAZ-2** (preparation of a HMBP, a RMP, and a SPCC Plan) and proposed new Condition of Certification **HAZ-3** (development of a SMP).

On-Site Spill Response

In order to address the issue of spill response, the facility will prepare and implement an emergency response plan that includes information on hazardous materials contingency and emergency response procedures, spill containment and prevention systems, personnel training, spill notification, on-site spill containment, and prevention equipment and capabilities, as well as other elements. Emergency procedures will be established which include evacuation, spill cleanup, hazard prevention, and emergency response. The presence of oil in a quantity greater than 1,320 gallons will invoke a requirement to prepare a SPCC Plan. The quantity of oil on the site far exceeds this threshold. In addition, pursuant to California HSC Sections 25270 through 25270.13, the ESEC LLC would be required to prepare a SPCC because it will store 10,000 gallons or more of petroleum on-site. The above regulations would also require the immediate reporting of a spill or release of 42 gallons or more to the California Office of Emergency Services and the CUPA (CESFD). An SPCC Plan would be required by Condition of Certification **HAZ-2**.

TRANSPORTATION OF HAZARDOUS MATERIALS

Various containerized and bulk hazardous materials would be transported to the facility via the truck. While many types of hazardous materials will be transported to the site, staff believes that transport of aqueous ammonia poses the predominant risk associated with hazardous materials transport. It should be noted that previous modeling of spills involving much larger quantities of aqueous ammonia than will be used, stored and transported to the proposed new power plant (~5,000 gallons of 29.4 percent aqueous ammonia delivered via tanker approximately one to two times per week for the UST and ~3000 gallons of 19 percent aqueous ammonia via a supply truck once every 3 – 6 months for the totes) has demonstrated that significant airborne concentrations would occur only at short distances from a spill.

Staff believes it is appropriate to rely upon the extensive regulatory program that applies to the shipment of hazardous materials on California highways to ensure safe handling in general transportation (see Federal Hazardous Materials Transportation Law 49 USC §5101 et seq, DOT regulations 49 CFR subpart H, §172–700, and California Department of Motor Vehicles (DMV) regulations on hazardous cargo). These regulations also address the issue of driver competence.

Based on the environmental mobility, toxicity, the quantities at the site, and the use of an UST and totes, staff concludes that the risk associated with the transportation of hazardous materials to the proposed modified project is less than significant. The risk of a spill while transferring aqueous ammonia from the tanker to the UST or from a truck to the totes remains the greatest risk and therefore staff also is proposing in newly proposed **HAZ-6** that the project owner (or the delivery vendor) provide and utilize a portable spill catchment basin whenever a tanker is off-loading 29.4 percent aqueous ammonia into the underground storage tank or 19 percent aqueous ammonia to the totes so as to capture any spills from the tanker, truck, or transfer hoses.

SEISMIC ISSUES

It is possible that an earthquake could cause the failure of hazardous materials storage tanks. An earthquake could also cause failure of the secondary containment system (berms and dikes), as well as the failure of electrically controlled valves and pumps. The failure of all of these preventive control measures might then result in leaks of chemicals or of natural gas that may cause fires or impact the environment.

Information obtained after the January 1994 Northridge earthquake showed that some damage was caused both to several large storage tanks and to smaller tanks associated with the water treatment system of a cogeneration facility. The tanks with the greatest damage, including seam leakage, were older tanks, while the newer tanks only sustained displacements and failures of attached lines. Staff reviewed the impacts of the February 2001, Nisqually earthquake near Olympia, Washington - a state with similar seismic design codes as California. No hazardous materials storage tanks failed as a result of that earthquake. Staff has also reviewed the impacts of the recent earthquakes in Haiti (January 12, 2010; magnitude 7.0) and Chile (February 27, 2010; magnitude 8.8). The building standards in Haiti are extremely lax while those in Chile are as stringent and modern as California seismic building codes. Yet, the preliminary reports show a lack of impact on hazardous materials storage and pipelines infrastructure in both countries. For Haiti, this most likely reflects a lack of industrial storage tanks and gas pipelines; for Chile, this most likely reflects the use of strong safety codes.

Staff also conducted an analysis of the codes and standards which should be followed when designing and building storage tanks and containment areas to withstand a large earthquake. Staff notes that the previously approved project (ESEC) would have been designed and constructed to the standards of the 2010 California Building Code for Seismic Risk Zone 4 (CEC 2005a) and the modified project (ESPFM) must also meet these seismic design criteria (although the designation of seismic zones has since been discontinued).

Therefore, on the basis of what occurred in Northridge (with older tanks) and the lack of failures during the Nisqually earthquake (with newer tanks) and in the 2010 Chilean earthquake (with rigorous seismic building codes), and given that the construction of ESPFM would comply with stringent California Building Codes, staff determines that tank failures during seismic events are not probable and do not represent a significant risk to the public.

SITE SECURITY

The North American Electric Reliability Corporation (NERC) published *Security Guidelines for the Electricity Sector* in 2002 (NERC 2002; 2012; 2014) as well as issued a Critical Infrastructure Protection standard for cyber security (NERC 2009 and 2014), and the U.S. Department of Energy published a draft *Vulnerability Assessment Methodology for Electric Power Infrastructure* in 2002 (DOE 2002). The energy generation sector is one of 14 areas of critical Infrastructure listed by the U.S. Department of Homeland Security. On April 9, 2007, the U.S. Department of Homeland Security published in the Federal Register (6 CFR Part 27) an Interim Final Rule (Chemical Facility Anti-Terrorism Standards or CFATS) requiring facilities that use or store certain hazardous materials to conduct vulnerability assessments and implement certain specified security measures. This rule was implemented with the publication of Appendix A, the list of chemicals on November 2, 2007, and the ESPFM is not proposing to use any material on the list in an amount which would trigger the need for compliance with the CFATS regulation.

However, even though the CFATS regulation does not apply, staff believes that all power plants under the jurisdiction of the Energy Commission should implement a minimum level of security consistent with the guidelines listed here. And although security already exists at this site because it is an operating power plant, staff proposes that the security be reviewed and updated.

In order to ensure that this facility (or a shipment of hazardous material) is not the target of unauthorized access, staff's proposed Condition of Certification **HAZ-5** would require the preparation and implementation of a formal written security plan. This plan would require the implementation of site security measures that are consistent with both the above-referenced documents and Energy Commission guidelines.

The goal of these conditions of certification is to provide the minimum level of security for power plants needed to protect California's electrical infrastructure from malicious mischief, vandalism, or domestic/foreign terrorist attacks. The level of security needed for this power plant is dependent upon the threat imposed, the likelihood of an adversarial attack, the likelihood of success in causing a catastrophic event, and the severity of consequences of that event.

In order to determine the level of security, staff used an internal vulnerability assessment decision matrix modeled after the U.S. Department of Justice Chemical Vulnerability Assessment Methodology (July 2002), the NERC 2002 guidelines, the U.S. Department of Energy VAM-CF model, and the U.S. Department of Homeland Security regulations published in the Federal Register (Interim Final Rule 6 CFR Part 27). Staff concluded that the ESPFM would fall into the "low vulnerability" category, so staff

proposes that certain security measures be implemented but does not propose that the project owner conduct its own vulnerability assessment.

These security measures include perimeter fencing, breach detectors, guards, alarms, site access procedures for employees and vendors, site personnel background checks, and law enforcement contact in the event of a security breach.

Site access for vendors would be strictly controlled. Consistent with current state and federal regulations governing the transport of hazardous materials, hazardous materials vendors would have to maintain their transport vehicle fleets and employ only drivers who are properly licensed and trained. The project owner would be required, through its contractual language with vendors, to ensure that vendors, if required by law, supplying hazardous materials strictly adhere to the DOT requirements that hazardous materials vendors prepare and implement security plans per 49 CFR 172.802 and ensure that all hazardous materials drivers are in compliance with personnel background security checks per 49 CFR Part 1572, Subparts A and B. The CPM may authorize modifications to these measures, or may require additional measures in response to additional guidance provided by the U.S. Department of Homeland Security, the U.S. Department of Energy, or NERC, after consultation with appropriate law enforcement agencies and the project owner.

NONOPERATION AND CLOSURE IMPACTS AND MITIGATION

Non-operation and closure of the proposed ESPFM would follow **COM-14** (Non-Operation) and **COM-15** (Facility Closure Planning) in the **Compliance Conditions and Compliance Monitoring Plan** section of this document. The facility closure plan is designed to minimize public health and environmental impacts The Facility Closure Plan would be consistent with all applicable LORS and would include monitoring of hazardous materials storage vessels, safe cessation of processes which use hazardous materials, disposal of hazardous materials and hazardous wastes, and documentation of practices and inventory (Solar Millennium 2009a, Section 5.6.3.4). Staff expects that impacts from non-operation and closure process would represent a fraction of the impacts associated with the construction or operation of the proposed ESPFM. Therefore based on staff's analysis for the construction and operation phases of this project, staff concludes that hazardous materials-related impacts from closure and decommissioning of the ESPFM would be insignificant.

CUMULATIVE IMPACT ANALYSIS

Staff analyzed the potential for the existence of cumulative impacts. A significant cumulative hazardous materials impact is defined as the simultaneous uncontrolled release of hazardous materials from multiple locations in a form (gas or liquid) that could cause a significant impact where the release of one hazardous material alone would not cause a significant impact.

The **Executive Summary** provides detailed information on the potential cumulative projects in the project area (see **Executive Summary Attachment A Table 1 El Segundo Energy Center –Cumulative Impacts**). Staff reviewed 30 projects that were

deemed completed, planned, or foreseeable. Staff notes that all of these projects or developments in the area or region that store or use hazardous materials already have or will need proper chemical storage tanks, secondary containment, and emergency response plans to address spills and accidental releases. Plan reviews and emergency response services provided by the local fire authority, be it the CESFD or that of another jurisdiction such as the nearby Manhattan Beach Fire Department, will also be conducted and provided.

All of the projects listed in **Executive Summary Attachment A Table 1 El Segundo Energy Center –Cumulative Impacts** are defined within a geographic area that has been identified by staff as covering an area large enough to provide a reasonable basis for evaluating cumulative impacts for all resource elements or environmental parameters (see **Cumulative Impacts- Figure 1** located in **Attachment A** of the **Executive Summary**). Most of these projects have, are, or will be required to undergo their own independent environmental review under the CEQA. Even if the cumulative projects described in the **Executive Summary** have not yet completed the required environmental processes, they were considered in the cumulative impacts analyses in this section.

Staff believes that while cumulative impacts are theoretically possible, they are not probable because of the many safeguards implemented to both prevent and control an accidental release. The chances of one accidental release occurring are remote. The chance of two or more occurring simultaneously, with resulting airborne plumes mingling to create a significant impact, are even more remote. Staff believes the risk to the public is insignificant.

Staff therefore believes that while cumulative impacts are theoretically possible, they are not probable because of the many safeguards implemented to both prevent and control the industrial environment, spills, and releases of hazardous materials.

To summarize, the project owner will develop and implement a hazardous materials handling program for the ESPFM independent of any other projects considered for potential cumulative impacts. Staff believes that the facility, as proposed by the project owner and with the additional mitigation measures proposed by staff, poses a minimal risk of accidental release that could result in off-site impacts. It is unlikely that an accidental release that has very low probability of occurrence would independently occur at this site and another facility at the same time. Therefore, staff concludes that the facility would not contribute to a significant hazardous materials-related cumulative impact.

COMPLIANCE WITH LORS

Staff concludes that demolition activities and the construction and operation of the modified ESEC project would be in compliance with all applicable LORS regarding long-term and short-term project impacts in the area of hazardous materials management.

NOTEWORTHY PUBLIC BENEFITS

The construction and operation of the natural-gas power plant proposed would require, in general, smaller quantities of hazardous materials and materials that are less dangerous to the public than the previously-licensed natural-gas fired power plant currently operating on the site. (One example is the discontinued use of aqueous hydrazine as an oxygen scavenger.) Building this modified power plant will supply required energy in California more efficiently using modern fast-start technology while at the same time reduce the risks of fire and hazardous materials spills.

RESPONSE TO AGENCY AND PUBLIC COMMENTS

Comments from the Project Owner:

The project owner had several comments regarding new proposed Condition of Certification **HAZ-5**, which addresses infrastructure security. The project owner's comments have been divided by staff into roughly four areas of concern:

1. Although the project owner recognizes that site security is currently a legal requirement or standard, the project owner appears to object to staff's proposal in that it makes security "an exact requirement" which may become "problematic because if a security law or regulation changes (as it is likely to do over the life of the plant) then the Security Plan should be changed". The project owner recommends that **HAZ-5** recognize this and include a paragraph that notes that subsequent changes to the applicable security requirements under the law shall take precedence over requirements specified in the condition and that project owner shall submit a revised Security Plan for review and approval in accordance with the condition should such circumstances arise.

2. The project owner has two concerns about the perimeter fence requirement found in Paragraph 1. First, placing a requirement in a condition of certification that a security plan be submitted after approval by the Energy Commission of a project (here a petition to amend a Decision) specifying the visual character and height of a perimeter fence or wall does not mean that the project could properly be allowed to contain such a fence or wall. The visual character of perimeter areas is subject to environmental analysis in other areas and such dimensions and visual characteristics, at a minimum would need to be analyzed under Land Use and Visual Resources. Second, the project owner is not certain that the existing facility contains fences or walls at least 8 feet high topped by barbed wire or the equivalent. Further, project owner did not include in the PTA (nor has the project ever included) proposing changes to the perimeter and fencing except for along 45th Street and along the bike path where other specific requirements are in place under Visual and Land Use conditions of certification. The project owner believes that all fences or walls are at least 6 feet in height and topped with barbed wire or equivalent. For these reasons, the project owner recommends that the height specified in Paragraph 1 of **HAZ-5** be "at least 6 feet".

3. The project owner also objects to the requirement found in Paragraph 9 that closed circuit TV (CCTV) of site security cameras be viewable in the security station at the plant gate, as well as in the control room. ESEC, however, currently uses the Control Room for Units 3, 4, 5, 6, 7 and 8 as the sole monitoring location for security. That set up is intentional. When the new units are constructed, the new control room will continue that arrangement. The project owner does not believe it is a requirement under federal or state law that an entrance gate guard shack has security camera closed circuit televisions, and suggests deleting from Paragraph 9 the phrase "and the security station located at the main entrance."

4. The project owner notes that Paragraph 10 is inconsistent and ambiguous as to exactly what it requires. It specifies three security measures labeled as "A", "B" and "C". However, Paragraph 10 lists them with an "either" as the beginning, an "and" after A, and an "or" after B. Thus, it is not clear whether staff intended the project owner to implement all three, or make a choice between some or all of the three options. The project owner also requests that the term "perimeter breach detectors" be defined. Finally, Paragraphs 9 and 10 do not appear to be consistent.

Staff Responses:

*1. Staff disagrees with the project owner that implementation of **HAZ-5** requirements would be problematic if new or revised security measures are adopted in the future. One could make that argument about any condition of certification. And the proposed **HAZ-5** already includes a paragraph noting that "[t]he project owner shall fully implement the security plans and obtain CPM approval of any substantive modifications to those security plans. The CPM may authorize modifications to these measures, or may require additional measures, such as protective barriers for critical power plant components (e.g. transformers, gas lines, compressors, etc.) or cyber security depending upon circumstances unique to the facility or in response to industry-related standards, security concerns, or additional guidance provided by the U.S. Department of Homeland Security, the U.S. Department of Energy, or the North American Electrical Reliability Corporation, after consultation with both appropriate law enforcement agencies and the project owner."*

2. Staff disagrees that a minimum height of eight feet for a security perimeter fence or wall would not be allowed or would be in conflict with Land Use or Visual conditions of certification. Land Use and Visual Resources staff were contacted about an 8-foot fence requirement and found no conflict with other COCs or LORS. Additionally, security fencing/walls is usually 8-feet high or taller, is standard in the industry, is required by DOD for DOD facilities, is found in the DOE security guidelines for the Energy Sector, and has been a requirement for power plants licensed by the Energy Commission since 2003. Staff urges the project owner to immediately submit plans to the CPM for review and approval, to correct this deficiency.

3. Staff agrees to remove the requirement for CCTV viewing in the guard room in Paragraph 9 and limit it to the control room.

4. Staff agrees that there were two typographical errors in Paragraph 10 that caused confusion and has corrected those errors. The choice given to the project owner is that between 24/7 guards with routine and random patrols plus perimeter breach detectors ***or*** *CCTV view of 100 percent of the perimeter. The intent here is to ensure that an intruder does not enter the site through, over, or under the perimeter fence/wall without being detected and intercepted.*

CONCLUSIONS

Staff's evaluation of the proposed modified project (with proposed additions and revisions to the mitigation measures) indicates that hazardous material use, storage, and transportation would not pose a significant impact on the public. Staff's analysis also shows that there would be no significant cumulative impact. With adoption of the proposed conditions of certification, the ESPFM would comply with all applicable LORS. Another proposed Condition of Certification addresses the issue of infrastructure security.

Staff at this time recommends that two existing Conditions of Certification, **HAZ-1** and **HAZ-2** be retained but revised to reflect current nomenclature, current Energy Commission practice, and to clarify certain requirements for hazardous materials plans. Condition of Certification **HAZ-1** ensures that no hazardous material would be used at the facility except as listed in **Appendix B** of this section, unless there is prior approval by the CPM. Condition of Certification **HAZ-2** ensures that local emergency response services are notified of the amounts and locations of hazardous materials at the facility and that a Hazardous Materials Business Plan (HMBP), RMP, and SPCC Plan are developed and implemented. Staff also recommends the deletion of existing Condition **HAZ-3** because the requirements contained therein have been incorporated into **HAZ-2**. Staff instead proposes a new Condition of Certification **HAZ-3** that would require the development of a SMP that addresses the delivery of all liquid hazardous materials during the demolition, construction, commissioning, and operation of the project thus further reducing the risk of any accidental release not specifically addressed by the proposed spill prevention mitigation measures, and also preventing the mixing of incompatible materials that could result in the generation of toxic vapors.

New Condition of Certification **HAZ-4** addresses the use of natural gas and prohibits its use to clear pipes and is mandated or strongly recommended by the United States Chemical Safety and Hazard Board (CSB), OSHA, NFPA, and the American Society of Mechanical Engineers (ASME). Site security, which already exists because it is an operating power plant, will nevertheless be required to be reviewed and updated in proposed new Condition of Certification **HAZ-5**. It is recommended that these security measures be implemented not later than sixty days after the PTA is approved. And finally, staff proposes new condition **HAZ-6** which would require the continued use of double-walled pipes for the transfer of 29.4 percent aqueous ammonia from the UST and portable catchment basins to collect and limit the spread of any spilled aqueous ammonia (29.4 or 19 percent) when transferring these hazardous materials from a delivery tanker or truck to the underground tank or tote. In this manner, no significant airborne concentration would migrate off-site to impact residents living to the south of the power plant.

(Revisions are in ~~strikeout~~ for deleted text and new text is shown in **bold underline**)

PROPOSED CONDITIONS OF CERTIFICATION

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.~~ **The project owner shall not use any hazardous material not listed in Appendix B below, or in greater quantities or strengths than those identified by chemical name in Appendix B, below, unless approved in advance by the Compliance Project Manager (CPM).**

~~Verification:~~ The project owner shall provide to the CPM, in the Annual Compliance Report, a list of ~~those~~ **all** hazardous materials ~~designated as regulated substances as set forth in Title 40, CFR Part 355, Subpart J section 355.50.~~ **contained at the facility.** The list shall also include maximum quantities of these substances at the facility. Copies of the list ~~should~~ **shall** also be provided to the city of El Segundo Fire Department (CESFD) ~~and the city of Manhattan Beach Fire Department (CMBFD).The project owner shall provide to the CPM, in the Annual Compliance Report, a list of hazardous materials contained at the facility.~~

HAZ-2 The project owner shall ~~update its existing Business Plan.~~ **concurrently** provide **an updated** revised Hazardous Materials Business Plan (HMBP), **a Revised Risk Management Plan (RMP), and a revised Spill Prevention, Control, and Countermeasure Plan (SPCC) to the CESFD and the CPM for review. After receiving comments from the CESFD and the CPM, the project owner shall include in the final documents all recommendations that ensure LORS compliance. Copies of the final RMP, HMBP, and SPCC Plan shall then be provided to the CESFD for information and to the CPM for approval. The project owner shall also pay the usual and customary fee for the CESFD review of those plans, and the usual and customary fee for any necessary and required inspections regarding same.**

~~Verification:~~ At least ~~45~~ **30** days prior to the start-up of the new ~~ESEC~~ Units 9, 10, 11, and 12, the **project** owner shall ~~undertake a hazardous materials floor plan exercise for each shift at the plant 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.~~ **final Hazardous Materials Business Plan, Risk Management Plan, and Spill Prevention, Control, and Countermeasures Plan to the CPM for approval.**

The project owner shall also provide proof that the plans were submitted to the CESFD for review and that the usual and customary fees for those reviews have been paid.

~~**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. Backup safety devices to be considered for the pipeline shall include sprinklers, sprays, deluge systems or equivalent systems. Special emphasis shall be placed on the deployment of such devices in the vicinity of the overpass at Vista Del Mar Boulevard in order to eliminate any vulnerabilities at that location.~~

~~**Verification:** At least 45 days prior to start-up 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-3 The project owner shall develop and implement a Safety Management Plan for the delivery and handling of liquid and gaseous hazardous materials. The plan shall include procedures, protective equipment requirements, training, and a checklist. It shall also include a section describing all measures to be implemented to prevent mixing of incompatible hazardous materials. This plan shall be applicable during construction, commissioning, and operation of the power plant.

Verification: At least 30 days prior to the delivery of any liquid or gaseous hazardous material to the facility for use at new Units 9, 10, 11, and 12, the project owner shall provide a Safety Management Plan as described above to the CPM for review and approval.

HAZ-4 The project owner shall not allow any fuel gas pipe cleaning activities on site at any power Unit, either before placing the pipe into service or at any time during the lifetime of the facility, that involve "flammable gas blows" where natural (or flammable) gas is used to blow out debris from piping and then vented to atmosphere. Instead, an inherently safer method involving a non-flammable gas (e.g. air, nitrogen, steam) or mechanical pigging shall be used as per NFPA 56. A written procedure shall be developed and implemented as per NFPA 56, section 4.3.1

Verification: At least 30 days before any fuel gas pipe cleaning activities begin at any Unit, the project owner shall submit a copy of the Fuel Gas Pipe Cleaning Work Plan (as described in NFPA 56, section 4.3.1) which shall indicate the method of cleaning to be used, what gas will be used, the source of pressurization, and whether a mechanical PIG will be used, to the CBO for information and to the CPM for review and approval.

HAZ-5 The project owner shall prepare a new or revise an existing site-specific Security Plan that will apply to all phases of activity on the site and that

shall be made available to the CPM for review and approval. The project owner shall implement site security measures that address physical site security and hazardous materials storage. The level of security to be implemented shall not be less than that described below.

The Security Plan shall include the following:

1. **Permanent full perimeter fence or wall, at least eight feet high; and topped with barbed wire or the equivalent or with the current metal spikes;**
2. **Main entrance security gate, either hand operated or motorized;**
3. **Evacuation procedures;**
4. **Protocol for contacting law enforcement and the CPM in the event of suspicious activity or emergency;**
5. **Written standard procedures for employees, contractors, and vendors when encountering suspicious objects or packages on site or off site;**
6. **A. A statement (refer to sample, ATTACHMENT A), signed by the project owner certifying that background investigations have been conducted on all project personnel. Background investigations shall be restricted to determine the accuracy of employee identity and employment history and shall be conducted in accordance with state and federal laws regarding security and privacy;**

   B.A statement(s) (refer to sample, ATTACHMENT B), signed by the contractor or authorized representative(s) for any permanent contractors or other technical contractors (as determined by the CPM after consultation with the project owner), that are present at any time on the site to repair, maintain, investigate, or conduct any other technical duties involving critical components (as determined by the CPM after consultation with the project owner) certifying that background investigations have been conducted on contractors who visit the project site. Background investigations shall be restricted to determine the accuracy of employee identity and employment history and shall be conducted in accordance with state and federal laws regarding security and privacy.;
7. **Site access controls for employees, contractors, vendors, and visitors;**
8. **A statement(s), (refer to sample, ATTACHMENT C), signed by the owner(s) or authorized representative(s) of hazardous materials transport vendor(s), certifying that they have prepared and implemented security plans in compliance with 49 CFR 172.802 and that they have conducted employee background investigations in accordance with 49 CFR Part 1572, subparts A and B;**

9. **Closed circuit TV (CCTV) monitoring system, recordable, and viewable in the power plant control room, and with cameras able to pan, tilt, and zoom, have low-light capability, and are able to view the outside entrance to the control room, the front gate, and key areas of the power block areas; and**

10. **Additional measures to ensure adequate perimeter security consisting of either:**

    A. security guard(s) present 24 hours per day, 7 days per week (conducting both routine and random patrols) and perimeter breach detectors;

    or

    B. CCTV able to view 100 percent of the perimeter fence.

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

Verification: **No later than sixty (60) days after the Petition to Amend is approved, the project owner shall notify the CPM that a site-specific Security Plan is available for review and approval. In the annual compliance report, the project owner shall include a statement that all current project employee and appropriate contractor background investigations have been performed, and that updated certification statements have been appended to the operations security plan. In the annual compliance report, the project owner shall include a statement that the operations security plan includes all current hazardous materials transport vendor certifications for security plans and employee background investigations.**

HAZ-6 The project owner shall:

1. **Continue to use and install double-walled piping with leak detection between the pipe walls for the pipes that transfer aqueous ammonia from the underground storage tank to the ammonia skids at each skid location.**

2. **Provide and utilize a portable spill catchment basin whenever a tanker is off-loading 29.4 percent aqueous ammonia into the underground storage tank or when a truck is off-loading 19 percent aqueous ammonia to a tote so as to capture any spills from the tanker, truck, or the transfer hose.**

3. Prepare and implement a Spill Capture Plan that includes procedures and methods to cover, contain, and remove any spilled 29.4 percent or 19 percent aqueous ammonia from the ground, trench, sump, or portable spill container within a time-frame of not less than 30 minutes.

Verification: Within thirty (30) days of the Commission Decision to approve the amendment, the project owner shall provide to the CPM for review and approval:

- **Proof that a portable spill catchment basin has been purchased or the contract that requires the vendors to provide such a portable basin; and**
- **The Spill Capture Plan.**

Within sixty (60) days after receiving CPM approval of the Spill Capture Plan, the project owner shall provide proof to the CPM that the mitigation described has been implemented.

SAMPLE CERTIFICATION (Attachment A)

Affidavit of Compliance for Project Owners

I,

_____

(Name of person signing affidavit)(Title)

do hereby certify that background investigations to ascertain the accuracy of the identity and employment history of all employees of

_____

(Company name)

for employment at

_____

(Project name and location)

have been conducted as required by the California Energy Commission Decision for the above-named project.

_____

(Signature of officer or agent)

Dated this _____ day of _____, 20 _____.

THIS AFFIDAVIT OF COMPLIANCE SHALL BE APPENDED TO THE PROJECT SECURITY PLAN AND SHALL BE RETAINED AT ALL TIMES AT THE PROJECT SITE FOR REVIEW BY THE CALIFORNIA ENERGY COMMISSION COMPLIANCE PROJECT MANAGER.

SAMPLE CERTIFICATION (Attachment B)

Affidavit of Compliance for Contractors

I,

_____

(Name of person signing affidavit)(Title)

do hereby certify that background investigations to ascertain the accuracy of the identity and employment history of all employees of

_____

(Company name)

for contract work at

_____

(Project name and location)

have been conducted as required by the California Energy Commission Decision for the above-named project.

_____

(Signature of officer or agent)

Dated this _____ day of _____, 20 _____.

THIS AFFIDAVIT OF COMPLIANCE SHALL BE APPENDED TO THE PROJECT SECURITY PLAN AND SHALL BE RETAINED AT ALL TIMES AT THE PROJECT SITE FOR REVIEW BY THE CALIFORNIA ENERGY COMMISSION COMPLIANCE PROJECT MANAGER.

SAMPLE CERTIFICATION (Attachment C)

Affidavit of Compliance for Hazardous Materials Transport Vendors

I,

_____

(Name of person signing affidavit)(Title)

do hereby certify that the below-named company has prepared and implemented security plans in conformity with 49 CFR 172.802 and has conducted employee background investigations in conformity with 49 CFR 172, subparts A and B,

_____

(Company name)

for hazardous materials delivery to

_____

(Project name and location)

as required by the California Energy Commission Decision for the above-named project.

_____

(Signature of officer or agent)

Dated this _____ day of _____, 20 _____.

THIS AFFIDAVIT OF COMPLIANCE SHALL BE APPENDED TO THE PROJECT SECURITY PLAN AND SHALL BE RETAINED AT ALL TIMES AT THE PROJECT SITE FOR REVIEW BY THE CALIFORNIA ENERGY COMMISSION COMPLIANCE PROJECT MANAGER.

REFERENCES

CEC 2005a- CEC (CEC-800-2005-001-CMF). El Segundo Power Redevelopment Project Commission Decision, dated February 2005.

CEC 2010a- CEC (CEC-800-2010-015). El Segundo Power Redevelopment Project Amendment Commission Decision, dated June 2010.

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

LL 2014f-Locke Lord / D. Hutchinson (TN 201814). Supplemental Data Related to Data Request Set 3 (No. 91 and 92). Submitted to CEC on 02/28/2014.

NRG 2013a- NRG / El Segundo Energy Center LLC (TN 70442) Petition to Amend, dated April 2013. Submitted to the Energy Commission on April 23, 2013.

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

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

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

HAZARDOUS MATERIALS Appendix A Table-1
Acute Ammonia Exposure Guidelines

Guideline	Responsible Authority	Applicable Exposed Group	Allowable Exposure Level	Allowable* Duration of Exposures	Potential Toxicity at Guideline Level/Intended Purpose of Guideline
IDLH[2]	NIOSH	Workplace standard used to identify appropriate respiratory protection.	300 ppm	30 minutes	Exposure above this level requires the use of "highly reliable" respiratory protection and poses the risk of death, serious irreversible injury, or impairment of the ability to escape.
IDLH/10[1]	EPA, NIOSH	Work place standard adjusted for general population factor of 10 for variation in sensitivity	30 ppm	30 minutes	Protects nearly all segments of general population from irreversible effects.
STEL[2]	NIOSH	Adult healthy male workers	35 ppm	15 minutes, 4 times per 8-hour day	No toxicity, including avoidance of irritation.
EEGL[3]	NRC	Adult healthy workers, military personnel	100 ppm	Generally less than 60 minutes	Significant irritation, but no impact on personnel in performance of emergency work; no irreversible health effects in healthy adults. Emergency conditions one-time exposure.
STPEL[4]	NRC	Most members of general population	50 ppm 75 ppm 100 ppm	60 minutes 30 minutes 10 minutes	Significant irritation, but protects nearly all segments of general population from irreversible acute or late effects. One-time accidental exposure.
TWA[2]	NIOSH	Adult healthy male workers	25 ppm	8 hours	No toxicity or irritation on continuous exposure for repeated 8-hour work shifts.

ERPG-2[5]	AIHA	Applicable only to emergency response planning for the general population (evacuation) (not intended as exposure criteria) (see preface attached)	200 ppm	60 minutes	Exposures above this level entail** unacceptable risk of irreversible effects in healthy adult members of the general population (no safety margin).

1) (EPA 1987) 2) (NIOSH 1994) 3) (NRC 1985) 4) (NRC 1972) 5) (AIHA 1989)

* The (NRC 1979), (WHO 1986), and (Henderson and Haggard 1943) all conclude that available data confirm the direct relationship to increases in effect with both increased exposure and increased exposure duration.

** The (NRC 1979) describes a study involving young animals, which suggests greater sensitivity to acute exposure in young animals. The WHO (1986) warned that the young, elderly, asthmatics, those with bronchitis, and those that exercise should also be considered at increased risk based on their demonstrated greater susceptibility to other non-specific irritants.

REFERENCES FOR HAZARDOUS MATERIALS APPENDIX A, TABLE 1

AIHA. 1989. American Industrial Hygienists Association, Emergency Response Planning Guideline, Ammonia, (and Preface) AIHA, Akron, OH.

EPA. 1987. U.S. Environmental Protection Agency, Technical Guidance for Hazards Analysis, EPA, Washington, D.C.

NRC. 1985. National Research Council, Criteria and Methods for Preparing Emergency Exposure Guidance Levels (EEGL), Short-Term Public Emergency Guidance Level (SPEGL), and Continuous Exposure Guidance Level (CEGL) documents, NRC, Washington, D.C.

NRC. 1972. Guideline for Short-Term Exposure of the Public to Air Pollutants. IV. Guide for Ammonia, NRC, Washington, D.C.

NIOSH. 1994. National Institute of Occupational Safety and Health, Pocket Guide to Chemical Hazards, U.S. Department of Health and Human Services, Washington D.C., Publication numbers 94-116.

WHO. 1986. World Health Organization, Environmental Health Criteria 54, Ammonia, WHO, Geneva, Switzerland.

Abbreviations for Hazardous Materials Appendix A,

TABLE 1

ACGIH, American Conference of Governmental and Industrial Hygienists

AIHA, American Industrial Hygienists Association

EEGL, Emergency Exposure Guidance Level

EPA, Environmental Protection Agency

ERPG, Emergency Response Planning Guidelines

IDLH, Immediately Dangerous to Life and Health Level

NIOSH, National Institute of Occupational Safety and Health

NRC, National Research Council

STEL, Short Term Exposure Limit

STPEL, Short Term Public Emergency Limit

TLV, Threshold Limit Value

WHO, World Health Organization

HAZARDOUS MATERIALS
APPENDIX B

Hazardous Materials Proposed for Use at the ESEC

(Including Locations on the Site)

APPENDIX B

Hazardous Materials and Wastes Usage and Storage during Construction and Operations*

Material	Purpose and Location	Usage/Day	Maximum Stored	Storage Type
A300- low hazard corrosion inhibitor	South of Unit 4 boiler	75 gal.	100 gal.	Steel drum, tote bin
Acetylene (C2H2) 99.80%	Southwest of warehouse	3,530 cu ft	10,950 cu ft	Cylinder
Ammonium Bicarbonate	South of Unit 4 boiler	400 lb.	600 lb.	Bag
Ammonium bifluoride NH4HF2	Chemical cleaning of HRSG	As needed	Temporary only	Portable vessel
Aqua ammonia (19%)	West of Unit 5 and 7	10 gal.	700 gal.	Steel tote (2)
Aqueous ammonia (29%) NH4(OH)	NOx emissions control. Top of hill and other locations	1500 gal.	20,000 gal.	Underground tank
Argon	Warehouse, south side and other locations	850 cu ft	1,410 cu ft	Cylinder
Asbestos Containing Debris	Hazardous waste storage area and accumulation areas	2,000 lb.	15,000 lb.	Steel drum
Bleach	North of Units 3, 4; southwest of Units 5 and 7	1,500 gal.	2,600 gal.	Aboveground tank
Calgon C-9 Corrosion Inhibitor	Chemical storage room, chemical feed areas	250 lb.	600 lb.	Plastic/Nonmetallic Drum
Calgon H-510 Microbiocide	Chemical storage room, chemical feed areas	250 lb.	600 lb.	Plastic/Nonmetallic Drum
Cardox –carbon dioxide	Unit 7 2nd level west side	3 tons	5 tons	Tank inside building
ChelClean 665 Chelating Agent	South of Unit 4 boiler	50,000 lb.	89,000 lb.	Poly tank
Citric acid	Chemical cleaning of HRSG, feed water systems	As needed	Temporary only	Portable vessel
CuSol Solvent Waste	South of Unit 4	100,000 gal.	180,000 gal.	Tank wagon
Dielectric Solvent	Unit 7 Aux. bay southwest corner; Unit 4 Aux. bay south end.	110 gal.	330 gal.	Steel drum
Diesel fuel	Warehouse, southwest side	110 gal.	165 gal.	Steel drum
Di-, tri-sodium phosphate solution	Boiler water pH/scale control	5 lb.	800 gal	Portable vessel
EDTA chelant	Chemical cleaning of HRSG, feed water systems	As needed	Temporary only	Portable vessel

APPENDIX B

Hazardous Materials and Wastes Usage and Storage during Construction and Operations*

Material	Purpose and Location	Usage/Day	Maximum Stored	Storage Type
Elimin-ox - Oxygen scavenger	Feedwater oxygen control. Under Unit 3 boiler and Unit 5 chemical area	500 gal.	800 gal.	Tote bin
EPA Protocol Mix (1.0% O2)	Warehouse, southwest side	282 cu ft	564 cu ft	Cylinder
EPA Protocol Mix (Nitric Oxide/Nitrogen[12.75ppm])	Warehouse, southwest side	564 cu ft	1,410 cu ft	Cylinder
EPA Protocol Mix (17% O_2)	Warehouse, southwest side	564 cu ft	1,410 cu ft	Cylinder
Flammable Gas Mixture#1	Warehouse, south side	846 cu ft	1,410 cu ft	Cylinder
Flammable Gas Mixture#2	Warehouse, southwest side	846 cu ft	1,410 cu ft	Cylinder
Flammable Gas Mixture#3	Warehouse, south side	846 cu ft	1,410 cu ft	Cylinder
Flammable Gas Mixture#4	Warehouse, southwest side	846 cu ft	1,410 cu ft	Cylinder
Flammable Gas Mixture#5 (72% Methane)	Warehouse, south side	846 cu ft	1,410 cu ft	Cylinder
Helium	Warehouse southwest side	282 cu ft	846 cu ft	Cylinder
Hydrochloric acid HCl	Chemical cleaning of HRSG	As needed	Temporary only	Portable vessel
Hydrogen	Unit 3 northwest side, ground level	30,000 cu ft	40,000 cu ft	Cylinder
Hydrogen	Generator cooling.	8,000 cu ft	70,000 cu ft	Tank, carbon steel
Lubricating Oil	Unit 5 ground floor; southwest Unit 7, Unit 3 & 4 ground floor.	27,800 gal	40,500 gal	Aboveground tank, steel drum.
Mineral Spirits	Paint shack	20 gallons	50 gallons	Can
Mineral Oil	Transformers at Units 1, 2, 3, and 4	87,800 gal	88,000 gal	Transformers
Nalco 350-corrosion inhibitor	Under Unit 3 boiler and Unit 5 chemical area	500 gal.	800 gal.	Tote bin
Nalco 356-corrosion inhibitor	Under Unit 3 boiler and Unit 5 chemical area	500 gal.	800 gal.	Tote bin
Nalco BT 3000	Boiler water treatment. Under Unit 3 boiler and Unit 5 chemical area	500 gal.	800 gal.	Tote bin
Nalco EG 5010	Boiler alkalinity control. Under Unit 3 boiler and Unit 5 chemical area.	500 gal.	800 gal.	Tote bin
Neutralizing amine solution	Feed water pH control	5 lb.	800 gal	Portable vessel
Nitrogen	Unit 3 north side	106,000 cu ft	141,265 cu ft	Aboveground tank, cylinder
Non-RCRA Hazardous Waste Silicone Grease and Debris	Hazardous waste storage area and accumulation area	55 lb.	110 lb.	Steel drum
Oil Contaminated Soil/Solids	Hazardous waste storage area and accumulation area	220 lb.	1,100 lb.	Steel drum
Oxides of Nitrogen Mix (Nitric Acid 34 PPM)	Warehouse, southwest side	564 cu ft	1,410 cu ft	Cylinder

APPENDIX B

Hazardous Materials and Wastes Usage and Storage during Construction and Operations*

Material	Purpose and Location	Usage/Day	Maximum Stored	Storage Type
Oxides of Nitrogen Mix(Nitric Oxide 59.50 PPM)	Warehouse, southwest side	564 cu ft	1,128 cu ft	Cylinder
Oxides of Nitrogen Mix(Nitric Oxide 125 PPM)	Warehouse, southwest side	846 cu ft	1,410 cu ft	Cylinder
Oxidizer	South of Unit 4 boiler	30,000 cu ft	45,000 cu ft	Cylinder trailer
Oxygen scavenger solution	Feedwater oxygen control	2.5 lb.	800 gal.	Portable vessel
Oxygen Mix (8.5% O2)	Warehouse, southwest side	564 cu ft	1,410 cu ft	Cylinder
Oxygen – gaseous oxygen	Warehouse, south side	1,128 cu ft	3,666 cu ft	Cylinder
Paint	Paint shack	25 gallons	100 gallons	Can
Propane	Warehouse, southwest side	200 gal.	400 gal.	Cylinder
Selig Formula 229 Degreaser	Unit 7 Aux. bay southwest corner; Unit 4 Aux. bay south end.	110 gal.	110 gal.	Steel drum
Sodium Hypochlorite 12.5% wt NaOCl	Southwest of Units 5&7, North of Units 3&4	1500 gal.	2,600 gal.	Aboveground storage tank
Sodium nitrite NaNO2	Chemical cleaning of HRSG	As needed	Temporary only	Portable vessel
Sulfuric acid for station Batteries	Electrical/ctrl bldg. Combustion turbine/miscellaneous	As needed	600 gal 732 gal 100 gal	Battery Battery Battery
Sulfur hexafluoride	Circuit Breakers	As needed		Compressed gas cylinder
Waste Hydrazine and Debris	Hazardous waste storage area and accumulation area	55 lb.	110 lb.	Steel drum
Waste Lubricating Oil	Hazardous waste storage area and accumulation area	220 lb.	550 lb.	Steel drum
Waste Mineral Oil for Transformers	Hazardous waste storage area and accumulation area	110 lb.	330 lb.	Steel drum
Waste Oil & Solvent	Hazardous waste storage area and accumulation area	450 lb.	1350 lb.	Steel drum
Waste Paint & Thinner	Hazardous waste storage area and accumulation area	55 lb.	110 lb.	Steel drum
Waste Paint Chips and Debris (with Benzene & Lead)	Near Paint shack and hazardous waste storage area	110 gal.	165 gal.	Steel drum
Waste Paint Solids/Sludge	Hazardous waste storage area and accumulation area	55 gal.	165 gal.	Steel drum
Waste Solvent and Debris	Hazardous waste storage area and accumulation area	55 lb.	110 lb.	Steel drum

*REFERENCE: NRG, 2000 BUSINESS PLAN UPDATE, NOVEMBER.
INFORMATION BASED ON TABLE 5.15-2 FROM 00-AFC-14 AND TABLE 2-14 AND PETITION TO AMEND, PAGES 2.17 – 2.20 (NRG 2013A)

LAND USE

Testimony of Michael C. Baron

SUMMARY OF CONCLUSIONS

Energy Commission staff (Staff) has reviewed the Petition to Amend (PTA) the Commission Decision for the El Segundo Energy Center (ESEC) in accordance with the requirements of the California Environmental Quality Act (CEQA). Staff's analysis considers the changes between the approved project and the modified project.

The project owner, El Segundo Energy Center, LLC (ESEC LLC) filed a PTA to the Commission Decision in April 2013. Staff's analysis concludes that the construction and operation of the proposed modification, referred to as the El Segundo Power Facility Modification (ESPFM) would not cause significant direct, indirect, or cumulatively adverse land use impacts and would be consistent with the applicable laws, ordinances, regulations, and standards (LORS) pertaining to land use.

INTRODUCTION

In this section, staff discusses if the ESPFM would result in substantial adverse impacts under CEQA, and if the project would be inconsistent with applicable LORS pertaining to land use.

LAWS, ORDINANCES, REGULATION, AND STANDARDS (LORS)

Staff's analysis shows that the proposed project would be consistent with the land use planning LORS analyzed in the 2005 Commission Decision as well as new local land use LORS identified in **LAND USE Table 1** in **bold**.

Staff did not find any new state or federal land use LORS applicable to the proposed project that were not reviewed for the issuance of the license by the Energy Commission in 2005 (CEC 2005).

The city of El Segundo adopted a comprehensive general plan in 1992 (City of El Segundo Municipal Code, Title 15 Zoning Regulations, 2013). The circulation element was last updated and re-adopted in 2004. The housing element was updated and re-adopted in July 2009. The city also adopted updates to the municipal code on October 15, 2013,' which included requirements related to Building Regulations and Residential Code, neither of which is applicable to the proposed amendment.

LAND USE Table 1
Applicable Laws, Ordinances, Regulations, and Standards (LORS)

Applicable LORS	*Description*
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	
Subdivision Map Act (Public Resources Code, section §66410-66499.58)	This section of the California Public Resources Code provides procedures and requirements regulating land division (subdivisions) and parcel legality. Regulation and control of the design and improvement of subdivisions have been vested in the legislative bodies of local agencies.
Warren-Alquist Act, Public Resources Code, section 25500 Public Resources Code, section 25529	In accordance with the provisions of this division, the commission shall have the exclusive power to certify all sites and related facilities in the state, whether a new site and related facility or a change or addition to an existing facility. No construction of any facility or modification of any existing facility shall be commenced without first obtaining certification for any such site and related facility by the commission. When a facility is proposed to be located in the coastal zone or any other area with recreational, scenic, or historic value, the commission shall require that an area be established for public use. Lands within such area shall be acquired and maintained by the applicant and shall be available for public access and use.
California Coastal Act Public Resources Code, section 30000 Et Seq. Public Resources Code, section 30101 Public Resources Code, section 30211 Public Resources Code, section 30260	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). Section 30101defines 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. 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. 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.
Ungranted State Tidelands and Submerged Lands Leasing Public Resources Code, section 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

Applicable LORS	*Description*
	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.
Local	
City of El Segundo General Plan, December 1, 1992. (Heavy Industrial)	Permits heavy manufacturing uses such as construction yards, factories, generating stations, extraction of raw materials, and refining. All uses must conform to the policies of the Hazardous Materials Element. The maximum allowed floor area ratio (FAR) is 0.6.
City of El Segundo Municipal Code Title 15, February 6, 1996. (Amended October 15, 2013); Chapter 2: General Provisions; and 15-2-3: Exceptions to Building Height	**These sections address structure heights.**
City of El Segundo Municipal Code Title 15, February 6, 1996. (Amended October 15, 2013) M-2 (Heavy Industrial) **15-6B-3: Permitted Accessory Uses; 15-6B-7: Site Development Standards; and 15-15-6: Required Parking Spaces**	This zone is intended to provide areas suitable for the development of heavy manufacturing, assembling, or processing activities having unusual or potentially deleterious operational characteristics, that would be detrimental if allowed to operate in other zones within the city. The zone district includes as a permitted use: heavy manufacturing, construction yards, factories, generating stations, and the extraction of raw materials and refining. **These sections address permitted uses, development standards, and parking requirements.**
City of El Segundo Local Coastal Program, July 1980 includes Coastal Zone Specific Plan (certified by California Coastal Commission on February 4, 1982)	Identifies land uses and standards by which development will be evaluated within the Coastal Zone. The plan identifies uses and provides standards adopted by the city of El Segundo for the “Power Plant” and “Shoreline Area” land use designations that are in conformance and satisfy the polices and requirements for coastal land use contained in the California Coastal Act 1976 and certified by the California Coastal Commission.
City of Manhattan Beach General Plan December 2, 2003	The city of Manhattan Beach General Plan was adopted in December 2, 2003. 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.
City of Manhattan Beach Municipal Code Title 15, June 1941. (Amended February 12, 2012)	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 Manhattan Beach Local Coastal Program, certified by California Coastal Commission on May 24, 1994 (Amended December 22, 2011)	Identifies land uses and standards by which development will be evaluated within the Coastal Zone. The plan identifies uses and provides standards under the jurisdiction of Manhattan Beach

Applicable LORS	*Description*
City of Los Angeles General Plan Land Use Element 2004	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 2004.
City of Los Angeles Municipal Code M2 (light Industrial)	This zone is intended to provide for the open storage of materials and equipment, including used materials and equipment unless conducted in accordance with the limitations specified in subsection A.4 (b) of section 12.19. The phrase "used materials and equipment" includes vehicles, boats, or airplanes which are inoperable, wrecked, damaged or unlicensed (i.e.; not currently licensed by the Department of Motor Vehicles) (LAMC 1974).

SETTING

The proposed ESPFM is located within the existing 33-acre ESEC power plant site. The address is 301 Vista Del Mar, El Segundo, approximately two miles south of the Los Angeles International Airport. It is located less than a 1/4 mile south of the Los Angeles Department of Water & Power's Scattergood Generating Station and 1/2 mile south of the city of Los Angeles' Hyperion Wastewater Treatment Plant. The Chevron El Segundo refinery is located across Vista Del Mar from ESEC site. The city of Manhattan Beach is immediately to the south. See **Project Description Figures 1** and **2.**

PROPOSED MODIFIED PROJECT

ESEC LLC filed a PTA to the Commission Decision in April 2013. The PTA proposes to replace utility boiler Units 3 and 4 with one new combined cycle generator (Unit 9), one steam turbine generator (Unit 10) and two simple-cycle gas turbines (Units 11 and 12) for the ESPFM project totaling 449 megawatts (MW). The current amendment proposes the demolition of Units 3 and 4, to be replaced with Units 9, 10, 11, and 12 and dry cooling technology. The petition also includes the removal of the existing once-through cooling processes at ESEC and construction of a combined administration, maintenance, and operations support building. Additional onsite parking and vehicle circulation would be provided to accompany the construction of an administration, maintenance, and operations support building.

There are no modifications to the existing conditions of certification for the ESPFM other than deletion of Conditions of Certification **LAND-12** Beach Restoration, **LAND-13** California State Lands Commission Lease, and **LAND-14** Emergency Service Vehicle and Equipment Passage. These conditions of certification were implemented as part of an approved 2010 amendment that proposed to deliver equipment to the ESEC facility via a beach delivery system (CEC 2010a). Subsequently, the project owner has decided not to pursue this form of delivery and the conditions of certification are not necessary. Staff supports the project owner's request to delete Conditions of Certification **LAND-12**, **LAND-13**, and **LAND-14**. All other remaining conditions of certifications would remain in effect for the ESPFM.

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

Energy Commission staff has analyzed the information provided in the Application for Certification (AFC) and the PTA, as well as information from other sources, to determine

consistency of the modified ESPFM project with applicable land use LORS and the ESPFM's potential to have significant adverse land use-related impacts.

METHODOLOGY AND THRESHOLDS FOR DETERMINING SIGNIFICANCE

Significance criteria used in this document are based on Appendix G of the CEQA Guidelines and performance standards or thresholds identified by Energy Commission staff, as well as applicable LORS utilized by other governmental regulatory agencies.

An impact may be considered significant if the proposed project results in:

- Conversion of Farmland or Forest Land;
  - Conversion of Prime Farmland, Unique Farmland, or Farmland of Statewide or Local Importance (Farmland) as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use..[28]
  - Conflict with existing zoning for agricultural use, or a Williamson Act contract.
  - Conflict with existing zoning for, or cause rezoning of, forest land [as defined in Pub. Resources Code §12220 (g)), timberland (as defined by Pub. Resources Code §4526), or timberland zoned Timberland Production (as defined by Gov. Code §51104 subd. (g)).
  - The loss of forest land or conversion of forest land to non-forest use.
  - Other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland to non-agricultural use or conversion of forest land to non-forest use. [29]
- Physical disruption or division of an established community;
- Conflict with any applicable habitat conservation plan, natural community conservation plan, or biological opinion;
- Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction, or that would normally have jurisdiction, over the project adopted for the purpose of avoiding or mitigating environmental effects. This includes, but is not limited to, a general plan, redevelopment plan, or zoning ordinance; or
- Incremental impacts that, although individually limited, are cumulatively considerable when viewed in connection with other project-related effects or the effects of past projects, other current projects, and probable future projects.[30]

[28] FMMP defines "land committed to non-agricultural use" as land that is permanently committed by local elected officials to non-agricultural development by virtue of decisions which cannot be reversed simply by a majority vote of a city council or county board of supervisors.

[29] A non-agricultural use in this context refers to land where agriculture (the production of food and fiber) does not constitute a substantial commercial use.

In general, a power plant and its related facilities may also be incompatible with existing or planned land uses, resulting in potentially significant impacts, if they create unmitigated noise, dust, or a public health or safety hazard or nuisance; result in adverse traffic or visual impacts; or preclude, interfere with, or unduly restrict existing or future uses.

DIRECT/INDIRECT IMPACTS AND MITIGATION

The ESPFM would be constructed within the boundaries of an existing power plant site. The current amendment proposes the demolition of Units 3 and 4, to be replaced with Units 9, 10, 11, and 12 and dry cooling technology. The petition also includes the removal of the existing once-through cooling processes at ESEC and construction of a combined administration, maintenance, and operations support building, modifications to the existing site access, and improvements to beach access.

This section discusses the applicable potential project impacts and associated methods and thresholds of significance referenced above.

Agriculture and Forest

A. Would the project convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to nonagricultural use?

The ESPFM would not create a loss or conversion of Farmland and would not result in a significant adverse impact under this CEQA criterion. According to the Farmland Mapping and Monitoring Program (FMMP) of the California Department of Conservation, there is no existing agricultural land within a five mile radius of the ESPFM site or city of El Segundo. The ESPFM area and vicinity are characterized by heavy industrial and urban development.

B. Would the project conflict with existing zoning for agricultural use, or a Williamson Act contract?

The ESPFM would not conflict with existing county zoning for agricultural use or a Williamson Act contract, or result in the conversion of farmland to a non-agricultural use. The ESPFM site is located on land zoned M-2 (Heavy Industrial) by the city of El Segundo (City of El Segundo 2013). The ESPFM would not conflict with this CEQA criterion and would not result in a significant impact.

C. Would the project conflict with existing zoning for, or cause rezoning of, forest land (as defined in Pub. Resources Code § 12220(g)), timberland (as defined by

[30] Cumulative impacts refer to two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts. The individual effects may be changes resulting from a single project or a number of separate projects and can result from individually minor, but collectively significant actions taking place over a period of time (Cal Code Regs., tit. 14,§15355; 40 C.F.R., §1508.7)

Pub. Resources Code § 4526), or timberland zoned Timberland Production (as defined by Gov. Code § 51104(g))?

The ESPFM would not conflict with zoning for, or cause rezoning of forest land, timberland or timberland zoned Timberland Production. The ESPFM area and vicinity are characterized by heavy industrial and urban development.

D. Would the project result in the loss of forest land or conversion of forest land to non-forest use?

The ESPFM would not result in the loss of forest land or conversion of forest land to non-forest use.[31] The ESPFM area and vicinity are characterized by heavy industrial and urban development. The ESPFM would not create a loss or conversion of forest land and would not result in a significant adverse impact under this CEQA criterion.

E. Would the project involve other changes in the existing environment which, due to their location or nature, could result in conversion of farmland, to nonagricultural use or conversion of forest land to non-forest use?

The ESPFM would not result in the conversion of farmland, to nonagricultural use or conversion of forest land to non-forest use. The ESPFM area and vicinity are characterized by heavy industrial and urban development. The ESPFM would not conflict with this CEQA criterion and would not result in a significant impact.

Physical Disruption or Division Of An Established Community

The ESPFM would not physically divide an established community. The ESPFM site is an existing power plant site surrounded by a mix of existing heavy industrial uses and residential homes. The ESPFM would not create a significant impact under this CEQA criterion.

Conflict with Any Applicable Habitat Conservation Plan Or Natural Community Conservation Plan

The ESPFM is not located within any Habitat Conservation Plan or Natural Community Conservation Plan and there would be no conflicts as a result of the proposed project.

Conflict with Any Applicable Land Use Plan, Policy or Regulation

California Coastal Act

The 33-acre ESEC 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

[31] In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment project; and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board (CCR2010).

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 which pertains to thermal electric generating plants. The proposed modernization would be located entirely within the ESEC 33-acre property. Consequently, the ESPFM 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.

City of El Segundo General Plan and Zoning Regulations

The ESEC site is zoned M-2 (Heavy Industrial) including a Heavy Industrial general plan land use designation. Both are intended to provide areas suitable for the development of heavy manufacturing, assembling, or processing activities having unusual or potentially deleterious operational characteristics, that would be detrimental if allowed to operate in other zones within the city. Both the zone district and general plan land use designation include as a permitted use: ancillary structures to permitted uses, heavy manufacturing, construction yards, factories, generating stations, and the extraction of raw materials and refining. As identified in the city of El Segundo municipal code section 15-6B-3: Permitted Accessory, the proposed administration, maintenance, and operations support building would be an ancillary structure to the permitted uses at the facility.

The petition includes the construction of a 30,000 sq. ft. administration, maintenance, and operations support building and additional parking area modifications within the current ESEC footprint. As identified in municipal code section 15-6B-7, the applicable development standards within the M-2 zone district for ESPFM are presented as follows:

Minimum Lot Area: The 33-acre ESPFM site would meet the minimum lot area standard of 20,000 square feet required by the city of El Segundo zoning ordinance.

Minimum Lot Width: The ESPFM site exceeds the minimum lot width of 100 feet required by the M-2 zone district and therefore, and would be consistent with the city of El Segundo zoning ordinance.

Minimum Setbacks: The minimum required setback for a front yard shall be twenty five feet minimum. A side yard setback shall be fifteen feet minimum, unless if the side yard adjoins a dedicated street, then no less than twenty five feet shall be provided; or if the side yard abuts properties with a different zone classification, then the setback required by the zone with the largest setback requirements shall apply. A rear yard setback shall be ten feet minimum, unless the rear yard adjoins an alley, dedicated street, or public right of way, or if the primary access is through the rear yard, then no less than twenty five feet shall be provided. If the rear yard abuts property with a different zone classification, then the setback required by the zone with the largest setback requirement shall apply.

Each side of the proposed administration, maintenance and operations support building would be located in excess of 50 feet from any property line or road right of way on the

ESEC property. Therefore the project would be consistent with the minimum setback required by the city of El Segundo M-2 zone district.

Maximum Height of Structures: The maximum allowable height in the city of El Segundo M-2 zone district is 200 feet. However, Chapter 2: General Provisions Section 15-2-3: Exceptions to building height, allows certain structures like smokestacks to be erected above the 200-foot height limit.

The administration, maintenance and operations support building would be approximately 40 feet tall and therefore consistent with the M-2 zone district maximum height requirement.

The ESEC will continue using the existing exhaust stacks for Units 5 & 6, which is one combined cycle exhaust stack at 210 feet AGL. Units 7 & 8 will also continue to be in-service and use one combined cycle exhaust stack at 210 feet AGL. The ESPFM proposes to construct an exhaust stack for Units 9 & 10, which would be one combined cycle exhaust stack at 210 feet AGL. Also, Units 11 &12 would use two simple cycle exhaust stacks at 150 feet AGL. Both the existing and proposed exhaust stacks would be consistent with the height requirements for the M-2 zone district while incorporating the provisions allowed under Section 15-2-3: Exceptions to building height.

Maximum Floor Area Ratio (FAR): The FAR is determined by dividing the gross floor area of all buildings on a lot by the area of that lot. The maximum allowable FAR in the M-2 zone district is 0.6. Energy Commission staff analyzed the FAR of the ESPFM including all existing and proposed structures by calculating the total square footage of existing structures using GIS and the total square footage of the proposed administration building, a total FAR of approximately 0.27 was determined. Therefore, the ESPFM would comply with the 0.6 FAR required by the city of El Segundo zoning ordinance.

On-site Parking: Municipal Code section 5-15-6: Required Parking Spaces requires 1 space for each 500 square feet for the first 50,000 square feet and 1 space for each 1,000 square feet for the area in excess of 50,000 square feet. The proposed administration, maintenance and operations support building would include an additional parking area providing 28 new standard parking spaces and the addition of 2 new handicapped spaces that would be compliant with the requirements of the Americans with Disabilities Act (ADA), Title 3 California Code of Regulations, and Title 24, California Access Code. The 28 standard parking spaces and 2 handicapped spaces would be in addition to the existing 88 onsite parking spaces. The proposed administration, maintenance and operations support building would be roughly 30,000 sq. ft. and would require a total of 60 parking spaces if the proposed structure were to be occupied solely as office space. The project owner did not indicate how many square feet of the proposed building would be dedicated to office space, so staff analyzed the proposed administration, maintenance and operations support building as if the entire building would be occupied solely as office space. The existing as well as proposed parking spaces at the ESEC facility would exceed the total number of required onsite parking spaces and the ESPFM would be consistent with the onsite parking requirements.

Construction Impacts and Mitigation

Construction Laydown and Worker Parking Area

The ESPFM proposes to use the same construction laydown area located at 777 West 190th Street in the city of Los Angeles that was used in the 2010 ESEC Petition to Amend decision. There is an existing 5,500 square foot building on the site. The laydown area is approximately 10 miles from the ESPFM site, west of the junction of U.S. Interstate 405 and U.S. Interstate 110. The laydown area will be used for additional worker parking and also to park machinery and store equipment to be used for the ESPFM.

The site is 12.1 acres with approximately 10 usable acres. A large portion of the property is asphalt surfaced and currently used for vehicle parking. The site would provide night lighting and perimeter fencing. Vehicle access to the laydown area would be from West 190th Street. The surrounding land uses adjacent to the laydown site consist of heavy and light industrial, and highway service related commercial.

The 10-acre property is in the city of Los Angeles “M-2” (Light Industrial) Zone (City of Los Angeles, Title 12 Zoning Regulations, 2013). Automobile parking space and loading space is permitted within this zone. The M-2 Zone (section 12.19) of the city of Los Angeles municipal code provides for the open storage of materials and equipment, including used materials and equipment unless conducted in accordance with the limitations specified in subsection A.4 (b) of section 12.19. The phrase “used materials and equipment” includes vehicles, boats, or airplanes which are inoperable, wrecked, damaged or unlicensed (i.e.; not currently licensed by the Department of Motor Vehicles) (LAMC 1974). The proposed use of the off-site laydown area would be consistent with the provisions required by the city of Los Angeles General Plan and municipal code.

Land Use Compatibility

In general, a power plant and its related facilities may also be incompatible with existing or planned land uses, resulting in potentially significant impacts, if they create unmitigated noise, dust, or a public health or safety hazard or nuisance; result in adverse traffic or visual impacts; or preclude, interfere with, or unduly restrict existing or future uses. Staff has conferred to determine that the ESPFM with implementation of conditions of certification would be compatible with surrounding land uses because it would not create significant unmitigated impacts to noise, public health and safety, traffic, hazardous materials, or visual resources.

CUMULATIVE IMPACTS

Under CEQA Guidelines, “a cumulative impact consists of an impact which is created as a result of the combination of the project evaluated in the EIR [environmental impact report] together with other projects causing related impacts” (Cal. Code Regs., tit. 14, §15130, Subd. (a)(1)). Cumulative impacts of the project must be discussed if the incremental effect of a project, combined with the effects of other projects is “cumulatively considerable” (Cal. Code Regs., tit. 14, §15130, Subd. (a)). Such incremental effects are to be viewed in connection with the effects of past projects, the

effects of other current projects, and the effects of probable future projects" (Cal. Code Regs., tit. 14, §15164, Subd. (b)(1)). Together, these projects comprise the cumulative scenario which forms the basis of the cumulative impact analysis.

The discussion of cumulative impacts shall reflect the severity of impacts and their likelihood of occurrence, "…but the discussion need not provide as great detail as is provided for the effects attributable to the project alone. The discussion of cumulative impacts shall be guided by standards of practicality and reasonableness, and should focus on the cumulative impact to which the identified other projects contribute rather than the attributes of other projects which do not contribute to the cumulative impact" (Cal. Code Regs., tit. 14, §15130, Subd. (b)).

Geographic Scope of Analysis

The geographic scope for the analysis of cumulative impacts related to land use includes existing urban landscape within the western Los Angeles County region. The cumulative land use analysis shown in **LAND USE Table 2** considers past, present and foreseeable projects within proximity (approximately 3 miles) of the proposed ESPFM.

The ESEC is located at the southernmost city limit of El Segundo on the coast of the Pacific Ocean between Dockweiler State Beach and the city of Manhattan Beach. The site is bordered by the Chevron refinery to the east, 45th Street in the city of Manhattan Beach on the south, the Pacific Ocean to the west, and the Chevron Marine Terminal to the north.

Energy Commission staff used a CEQA Net database search for projects in Los Angeles County and cities within the county. Staff also contacted planning staff with Los Angeles County, El Segundo, and the cities adjacent to El Segundo (Marina Del Ray, Hermosa Beach, Los Angeles, Manhattan Beach, Torrance, and Redondo Beach) to develop a list of large residential development, industrial, and commercial projects. Staff considers the following projects in **LAND USE Table 2** part of the cumulative setting for land use issues. The table provides a list of projects considered part of the land use cumulative analysis, including the label ID that correlates with **CUMULATIVE IMPACTS Figure 1** in the **Executive Summary** section of this document. The table shows the name of the project, a brief description, location, and distance from the ESPFM.

LAND USE Table 2
ESPFM List of Cumulative Projects

Projects referenced with a POINT					
Label ID	Status	Project Name	Project Description	Location	Distance (Miles)
1	**Completed/ Past**	El Segundo	Redevelopment of power plant Units 1 and 2.	301 Vista Del Mar, El Segundo	0.19
2	**Completed/ Past**	Chevron Coke Drum Project	Removal of six existing coke drums and installation of six new coke drums with the same capacity and location in the Delayed Coker Unit.	324 West El Segundo Blvd., El Segundo	0.49
3	**Planned/ Present**	EA-974	Central Reliability Center, central tool room. New: 101,000 sq. ft.; existing to remain: 13,000 sq. ft.; new total is 114,000 sq. ft.	324 West El Segundo Blvd., El Segundo	0.58
4	**Foreseeable**	Scattergood Generating Station	The Los Angeles Dept. of Water and Power would construct four power-generating units at the Scattergood Generating Station. Some structures would be demolished and two full size units on the lower level and two smaller units on the middle level of the plant would be constructed. The project work force will utilize on-site parking.	12700 Vista Del Mar, Los Angeles	0.72
5	**Planned/ Present**	EA-1020	New 5,127 sq. ft. office/research and development building	138 Eucalyptus Dr., El Segundo	0.85
6	**Planned/ Present**	EA-961	386 sq. ft. office and 3019 sq. ft. warehouse	130 Arena St., El Segundo	0.90
7	**Planned/ Present**	EA-1004	Two new creative office and research and development buildings. 1,297 sq. ft. office, 7,803 sq. ft. research and development, 1,194 sq. ft. warehouse, total 10,294 sq. ft.	134 Penn St., El Segundo	1.00
8	**Planned/ Present**	EA-1003	Two new creative office and research and development buildings. 1,297 sq. ft. office, 7,803 sq. ft. research and development, 1,194 sq. ft. warehouse, total 10,294 sq. ft	130 Penn St., El Segundo	1.01
9	**Planned/ Present**	EA-781	7-Unit Residential Condominium, 14,313 sq. ft.	301,303,305 Palm Ave., El Segundo	1.20
10	**Foreseeable**	EA-1038	4-unit condominium (6,963 sq. ft.), 2 stories, semi-subterranean parking.	711 Main St. El	1.25

Projects referenced with a POINT					
Label ID	Status	Project Name	Project Description	Location	Distance (Miles)
				Segundo	
11	**Planned/ Present**	EA-1014	2-lot subdivision for two 6-unit multi-family residential condos (12 total units)	115 East Walnut Ave., El Segundo	1.52
12	**Planned/ Present**	EA-959	Two office buildings; 30,660 sq. ft.	222 Kansas St. El Segundo	1.54
13	**Foreseeable**	EA-993, The Point	119,275 sq. ft. total. Shopping center (71,343 sq. ft.), restaurant (25,627 sq. ft.), and office (27,338 sq. ft.).	820-850 S. Sepulveda Blvd., El Segundo	1.60
14	**Foreseeable**	Civic Center/Metlox Development	Demolition and reconstruction of the existing police and fire department facilities to include a two-level (one level below grade), approx. 57,000 sq. ft. combined police and fire dept. public safety facility. The existing public library would be reconstructed by either adding on to the existing 12,100 sq. ft. public library or demolished and reconstructed with a new public library and cultural arts center for an approx. 40,000 sq. ft. structure with roughly 30,000 sq. ft. for library space and 10,000 sq. ft. for a 99-seat cultural arts center. The Metlox project consists of a mixed-use commercial development with subterranean parking, incl. some above-grade surface parking on the proposed 13th Street extension. The total floor area proposed is approx. 90,000 sq. ft. comprised of retail, restaurant, a 40-room bed and breakfast lodging component, and office uses.	Site boundaries: 15th St. on north, Valley Dr. on east, Manhattan Beach Blvd. on south, and Highland Ave. and Morningside Dr. on west; Manhattan Beach	1.67
15	**Planned**	EA-890, El Segundo Unified School District	304 Senior housing/assisted living facility up to 175,000 sq. ft.	540 E. Imperial Ave., El Segundo	1.72
16	**Planned**	EA-958	9 residential condo units	1700 E Mariposa Ave., El Segundo	1.79
17	**Foreseeable**	Manhattan Village Shopping Center Enhancement Project	A net increase of approx. 123,672 sq. ft. restaurant and retail (approx. 194,644 sq. ft. new area and demolition of approx. 70,972 sq. ft. existing retail, restaurant, and cinema) to be developed within three components. The shopping center would include a total of approx. 696,509 sq. ft. An “equivalency program” is proposed that provides for the exchange between land uses based on P.M. peak traffic equivalency factors. A maximum of 133,389 sq. ft. net new area (approx. 204,361 sq. ft. new area and demolition of approx. 70,972 sq. ft. existing retail,	3200-3600 North Sepulveda Blvd., Manhattan Beach	1.81

Projects referenced with a POINT					
Label ID	Status	Project Name	Project Description	Location	Distance (Miles)
			restaurant, and cinema) would be developed for a total of up to 706,226 sq. ft. Approx, 544 parking spaces would be provided in surface parking areas and within multiple parking structures.		
18	**Planned**	EA-912	New 3,714 sq. ft. restaurant with drive through; parking and landscaping redesign; outdoor dining	600 - 630 North Sepulveda Blvd., El Segundo	1.93
19	**Planned**	Cambria Suites, EA-844	152 room hotel – 71,000 sq. ft.	199 Continental Blvd., El Segundo	1.99
20	**Foreseeable**	EA-905, Raytheon Campus Specific Plan	Approx. 2.1 million (2,142,457) square-foot Office Park Expansion (office, retail, warehouse, light industrial).	2100 El Segundo Boulevard, El Segundo	2.00
21	**Foreseeable**	EA-986, Mattel	R&D and office, 14 stories, 300,000 sq. ft., 810-space parking structure-8-stories	455 Continental Blvd. and 19055 E. Grand Ave., El Segundo	2.00
22	**Planned/ Present**	EA-981	Office, 194,119 sq. ft.	1700 East Imperial Ave., El Segundo	2.07
23	**Foreseeable**	EA-997, Hotel	5-story, 190 room hotel, 107,090 sq. ft.	888 North Sepulveda, El Segundo	2.13
24	**Planned/ Present**	EA-996	2800 sq. ft. convenience store	2161 E. El Segundo Blvd. El Segundo	2.13
25	**Planned/ Present**	Central Utility Plant Replacement	Replace the 50-year old existing Central Utility Plant (CUP) with a more modern and energy efficient facility	LAX, Los Angeles	2.22
	Planned/ Present	New Tom Bradley International	18 new gates to the west side of the Tom Bradley International Terminal, great hall for dining and retail shopping.		

Projects referenced with a POINT					
Label ID	Status	Project Name	Project Description	Location	Distance (Miles)
		Terminal			
	Planned/ Present	LAX Curbside Appeal Project	Phase 1: New Canopy, landscaping, light band, and new light poles in front of Tom Bradley International Terminal; Phase 2: Light band, light poles, and canopies in front of the terminal in the LAX Central Terminal Area		
	Planned/ Present	Runway Status Lights	With completion of the installation of the prototype runway status lights in 2009, the full system will be installed. Runway status lights use a series of red lights embedded in the pavement to warn pilots if it is unsafe to cross or enter a runway, or to take off.		
26	**Planned/ Present**	EA-971	Data Center, addition of 75,435 sq. ft., demo of 11,769 sq. ft. out of existing for new total sq. ft. of 180,422.	444 N Nash St., El Segundo	2.33
27	**Foreseeable**	West Aircraft Maintenance Area	Replace existing facilities and consolidate maintenance operations; paved area for aircraft parking, maintenance hangars, 300-space employee parking lot, storage, equipment related facilities, and ground run-up enclosure.	LAX, Los Angeles	2.35
	Foreseeable	Midfield Satellite Concourse North	Phase 1 of the MSC Program (northern portion of the MSC facility and associated improvements). Project components include a concourse for up to 11 gates and assoc. facilities; improvements to taxiways and taxilanes; ramp tower or FAA supplemental airport traffic control tower; and utilities to support the North MSC facility.		
	Foreseeable	LAX Runway 7L/25R Runway Safety Area (RSA) Project & Associated Improvements	1) Extend Runway 7L/25R pavement; grade and compact the RSA; construct blast pad west of Runway 7L extension; several taxiways modifications as necessary; relocate existing Localizer Antenna and shelter to the west; replace existing Approach Lighting System (ALS) towers with in-pavement lights; and modify existing Runway and Taxiway lighting and markings in newly constructed pavements; 2) Reconstruct pavement of eastern portions of Runway 7L/25R and Taxiway B including connecting taxiways and installation of in-pavement approach lights; 3) Reconstruct pavement of aircraft parking apron west of Air Freight Building No. 8, including new markings.		
	Foreseeable	LAX Runway 6L-24R Safety Area & Associated	Improve Runway 6L-24R and service roads to bring runway into compliance with applicable FAA design criteria.		

Projects referenced with a POINT					
Label ID	Status	Project Name	Project Description	Location	Distance (Miles)
		Improvements			
28	**Planned/ Present**	Wiseburn High School	New high school, 180,000 to 240,000 sq. ft.	201 North Douglas, El Segundo	2.37
29	**Foreseeable**	EA-1021	625,205 sq. ft. total; 611,545 sq. ft. office, 12,660 sq. ft. retail	710 North Nash St., El Segundo	2.38
30	**Foreseeable**	EA-1040	28,406 sq. ft. office, 33,475 sq. ft. light industrial, total 61,881 sq. ft.	400 Duley Rd. El Segundo	2.45
31	**Planned/ Present**	EA-784	Data Center, 332,137 sq. ft.	445 N Douglas Street, El Segundo	2.45
32	**Planned/ Present**	EA-1001	2355 Utah: Convert existing 42,548 sq. ft. to all office, add 1687 sq. ft. 2383 Utah: Convert existing 152,506 sq. ft. to all office, add 6850 sq. ft.	2355 Utah and 2383 Utah Ave., El Segundo	2.53

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Cumulative Impacts Conclusion

The potential for the ESPFM to cause significant cumulative impacts has been considered using the Appendix G of the CEQA Guidelines. The projects shown in **LAND USE Table 2** were cumulatively considered with the ESPFM.

Staff has concluded that the ESPFM has no direct or indirect land use impacts and would not contribute to cumulative land use impacts. Therefore, the project's impacts when combined with the land use impacts of the other projects within the geographic scope identified in the cumulative analysis would not be cumulatively considerable.

Staff concludes the following for cumulative impacts.

- The ESPFM would have no direct or indirect impacts on farmland and would not contribute to cumulative impacts on this resource.
- The ESPFM would not conflict with existing zoning for agricultural use. The ESPFM would not contribute to cumulative impacts on agricultural uses.
- The ESPFM would not conflict with existing zoning for or cause rezoning of forest land or timberland and would not contribute to cumulative impacts on these resources.
- The ESPFM would not result in the loss or conversion of forest land and would not contribute to cumulative impacts on this resource.
- The ESPFM would not involve changes in the environment that would result in the conversion of farmland or forest land and would not contribute to cumulative impacts on these resources.
- The existing ESEC site is not within an approved U.S. Fish and Wildlife Service habitat conservation plan under section 10 of the Endangered Species Act, or within an approved California Department of Fish and Wildlife natural community conservation plan under section 2800 of the Natural Communities Conservation Act and would not contribute to cumulative impacts under this criterion.
- The ESPFM would not result in incremental land use impacts that are cumulatively considerable when viewed in connection with other project-related effects or the effects of past projects, other current projects, and probable future projects.

COMPLIANCE WITH LORS

Staff's independent analysis of the ESPFM concludes that the project would comply with all applicable land use LORS. **LAND USE Table 3** summarizes the ESPFM project conformance with applicable LORS.

LAND USE Table 3
LORS Applicable to the Land Use Analysis

Applicable LORS	Description	Consistency Determination	Basis for Consistency
Federal			
Federal Aviation Regulations (Code of Federal Regulations, Part 77)	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.	Yes	Condition of Certification **LAND-3** from the original license would ensure on-going compliance with the FAA Advisory Circular 70/7460-1K and require compliance for the existing exhaust stacks (Units 5& 6 (one combined cycle stack at 210 feet AGL) and Units 7 & 8 (one combined cycle stack at 210 feet AGL)) and the proposed exhaust stacks (Units 9 & 10 (one combined cycle stack at 210 feet AGL) and Units 11 &12 (two simple cycle stacks at 150 feet AGL)).
State			
Subdivision Map Act (Public Resources Code § 66410-66499.58)	Governs the creation, recognition, consolidation or reconfiguration, adjustment and elimination of parcels on land within California.	Yes	The ESPFM would not cause a re-evaluation of the Subdivision Map Act
Warren-Alquist Act, Public Resources Code § 25500 et seq. California Coastal Act, Public Resources Code, section 25529	Establishes a comprehensive approach to govern land use planning along the entire California coast. Establishes a comprehensive approach to public access along the entire California coast.	Yes	The ESPFM would be developed within an existing electrical generating facility and would not result in a change in land use that adversely affects coastal resources or public access.
California Coastal Act Public Resources Code, section 30000 Public Resources Code, section 30101 Public Resources Code, section 30211 Public Resources Code, section 30260	The California Coastal Act establishes a comprehensive scheme to govern land use planning along the entire California coast Defines “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.” Requires that new development not interfere with the public’s right of access to the shoreline. Encourages the use of existing coastal-dependent industrial sites within the Coastal Zone instead of using undeveloped areas of the	Yes	The ESPFM would be developed within an existing electrical generating facility and would not result in a change in land use that adversely affects coastal resources or public access. No coastal access would be denied to the public as a result of the ESPFM and no new access would be required.

Applicable LORS	Description	Consistency Determination	Basis for Consistency
	Coastal Zone.		
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	Yes	The ESPFM proposes to remove the once through ocean water cooling system from the facility, which would eliminate requirements associated with submerged lands.
Local			
City of Segundo General Plan, December 1, 1992.	The general plan designates the proposed general distribution and general location and extent of the uses of the land for housing, business, industry, open space, including agriculture, natural resources, recreation, and enjoyment of scenic beauty, education, public buildings and grounds, solid and liquid waste disposal facilities, and other categories of public and private uses of land.	Yes	The ESPFM would be developed within an existing electrical generating facility consistent with the city of El Segundo Heavy Industrial Land Use Designation and would not require additional review.
Heavy Industrial Land Use Designation	**Permits heavy manufacturing uses such as construction yards, factories, generating stations, extraction of raw materials, and refining. All uses must conform to the policies of the Hazardous Materials Element. The maximum allowed floor area ratio (FAR) is 0.6.**		**The ESPFM would have a maximum FAR of approximately 0.27**
City of El Segundo Municipal Code Title 15, February 6, 1996 (Amended October 15, 2013) Chapter 2: General Provisions 15-2-3: Exceptions to Building Height	**Smokestacks and other similar structures may be erected above the height limits prescribed in this title.**	Yes	**Two of the proposed HRSGS would be 210 AGL, which exceeds the 200 foot height limitation for the city of El Segundo M-2 Industrial zone district. However 15-2-3 would allow the 210 foot HRSGS as they are similar in nature to a smoke stack.**
City of El Segundo Municipal Code Title 15, February 6, 1996 (Amended October 15, 2013) M-2 (Heavy Industrial)	The zoning code is intended to provide areas suitable for the development of heavy manufacturing, assembling, or processing activities having unusual or potentially deleterious operational characteristics, that would be detrimental if allowed to operate in other zones within the city	Yes	The ESPFM would be developed within an existing electrical generating facility consistent with the El Segundo M-2 (Heavy Industrial) zone district. The zone district includes as a permitted use: heavy manufacturing, construction yards, factories, generating stations and the extraction of raw materials and refining and would not require additional review
15-6B-3: Permitted	**A. Any use customarily**		**The construction of an**

Applicable LORS	Description	Consistency Determination	Basis for Consistency
Accessory Uses	**incidental to a permitted use.** **C. General office and laboratory uses.** **E. Other similar uses approved by the director of community, economic and development services, as provided by chapter 22 of this title. (Ord. 1212, 11-16-1993; amd. Ord. 1257, 6-18-1996; Ord. 1315, 1-18-2000)**		**administration, maintenance, and operations support building would be allowed as customarily incidental to the permitted use of the site as an energy facility.**
15-6B-7: SITE DEVELOPMENT STANDARDS	**A. General Provisions:** **1. Operations and uses conducted on the premises, which are or may be in violation of this code, state laws, or environmental regulations by reason of noise, odor, dust, mud, light, smoke, vibrations or other similar causes, shall conform to all city, state and federal regulations which are designed to protect the health, safety and welfare of the citizens of this city and the employees of the proposed use.** **2. Prior to approval of any development project, all criteria of the transportation demand management (TDM) and trip reduction criteria, as provided for in chapter 16 of this title shall be met.** **3 Other provisions as required in chapter 2 of this title.** **B. Lot Area: A minimum of twenty thousand (20,000) square feet.** **C. Height: Buildings and structures shall not exceed a height of two hundred feet (200').**		**With the exception of the HRSGS exceeding 200 feet allowed under 15-2-3 of the El Segundo Zoning Code, the ESPFM has been designed to meet all of the required development standards of the M-2 Industrial zone district.**
15-15-6: REQUIRED PARKING SPACES	**1 space for each 500 square feet for the first 50,000 square feet; 1 space for each 1,000 square feet for the area in excess of 50,000 square feet**		**The proposed administration maintenance and operations support building would include an additional parking area with the addition of 28 standard parking spaces and 2 handicapped spaces in addition to the existing onsite parking facilities, which**

Applicable LORS	Description	Consistency Determination	Basis for Consistency
			exceed the required number of on-site parking facilities for all structures on-site.
City of El Segundo Local Coastal Program, July 1980 includes Coastal Zone Specific Plan (certified by California Coastal Commission on February 4, 1982)	Develop a land use plan for the Coastal Zone that protects and enhances coastal resources, promotes public access and balances development with facility needs.	Yes	The ESPFM would be developed within an existing electrical generating facility and would not result in a change in land use that adversely affects coastal resources. The existing conditions of certification would ensure that adverse impacts associated with the project are mitigated or minimized to the greatest extent feasible.
City of Manhattan Beach General Plan December 2, 2003	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	Yes	The ESPFM would be developed within an existing electrical generating facility and would not require the construction of any off-site sewer lines. Therefore the proposed amendment would not trigger additional review of City of Manhattan Beach General Plan.
City of Manhattan Beach Municipal Code February 21, 2012.	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.	Yes	The ESPFM would be developed within an existing electrical generating facility and would not require the construction of any additional off-site sewer lines within the right of way as part of the proposed amendment and would not trigger additional review of City of Manhattan Beach Municipal Code.
City of Manhattan Beach Local Coastal Program, certified by California Coastal Commission on May 24, 1994 (Amended December 22, 2011)	Develop a land use plan for the Coastal Zone that protects and enhances coastal resources, promotes public access and balances development with the natural ecosystem.	Yes	The ESPFM would be developed within an existing electrical generating facility and would not result in an expansion into the city of Manhattan Beach. The existing conditions of certification would ensure that adverse impacts associated with the project are mitigated or minimized to the greatest extent feasible.
City of Los Angeles General Plan Land Use Element 2004	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	Yes	The ESPFM would be developed within an existing electrical generating facility and does not require the construction of any off-site water pipelines.

Applicable LORS	Description	Consistency Determination	Basis for Consistency
	pipelines in the city of Los Angeles's public right-of-way.		
Los Angeles Municipal Code M2 (light Industrial)	The Purpose of the Los Angeles Municipal Code is to allow uses that are consistent with surrounding developments within a geographic area.	Yes	The temporary offsite construction laydown and worker parking area would be consistent with the city's zoning regulations, and is an allowable use within the M2 zone district.

NOTEWORTHY PUBLIC BENEFITS

Staff has not identified any noteworthy public benefits related to land use.

RESPONSE TO AGENCY AND PUBLIC COMMENTS

Staff has responded to one comment from the public below and has not received any agency comments related to land use for the ESPFM.

Public Statement: At the public workshop held April 22, 2014, Michelle Murphy reiterated her earlier comment about the California Coastal Commission (CCC) coastal zone enhancement requirements. She explained that in the winter there is no beach access for pedestrians, particularly during high tide. The only access to the beach for pedestrians is via a busy road on the other side of the plant. Michelle Murphy reiterated her request from the prior amendment and asked for a pedestrian path to be built. Written comments from Michele Murphy (TN# 202321) related to both handicapped and pedestrian access were also submitted to the Commission. The comments state that the additional handicapped access provided by the project owner is not a good idea and that there is already a wheelchair ramp only a few blocks away that leads to a restaurant and a spot where the city will be building a cement ramp to allow handicapped folks closer access to the ocean. Staff responded at the public workshop on April 22, 2014, that they would consider her comments concerning pedestrian access to the beach.

Background: The issues of additional handicapped access and limited pedestrian access were identified by staff in the original 2005 licensing of the project. The additional handicapped access is a required enhancement by the CCC. The Energy Commission required Condition of Certification **LAND-9** to improve access to the beach along the western edge of the power plant. Condition of Certification **LAND-9** requires designation of public use areas, which are not limited to the expanded bicycle path. Condition of Certification **LAND-9** was also adopted by the Commission in a 2007 amendment.

Staff Response to Public Comment: Staff does not agree with the comments in reference to the additional handicapped access. It is the position of staff that the additional handicapped access provided is sufficient to meet the requirement for additional access to the bike path and has been constructed in compliance with the

provisions of the Americans with Disabilities Act. Additionally, the bike path referred to in the public comments is a portion of the Marvin Broude bike path that is maintained by the County of Los Angeles. The Los Angeles County Department of Public Works webpage Bikeway Map specifically labels the path as a "Bike Path". The Bike Path label is defined by the county as an off-street shared use path for bicycles and pedestrians (LAC 2014) and is governed by California Vehicle Code, section 21966. Vehicle Code section 21966 states, "No pedestrian shall proceed along a bicycle path or lane where there is an adjacent adequate pedestrian facility." The addition of a pedestrian path adjacent to the bike path is not feasible due to the physical constraints of the area between the existing facility and its perimeter wall, the bike path, sea wall, and the shoreline. The project owner has completed moving the western fence line back 3 feet, installing public park-type benches, and installing additional landscaping to ensure on-going compliance with Condition of Certification **LAND-9**.

CONCLUSIONS

The land use analysis focused on two main issues; (1) would the project cause significant land use planning impact(s) under the CEQA and Guidelines, and (2) would the project comply with applicable state and local LORS pertaining to land use.

Staff has concluded that the proposed ESPFM would be consistent with all LORS that were identified in the 2005 Commissions Decision including additional LORS as a result of the proposed amendment for the construction of a new operations, maintenance and operations building.

The construction of the ESPFM project with the effective implementation of staff's recommended conditions of certification would not cause a direct, indirect or cumulative adverse land use planning impact under CEQA, and would ensure conformance with the applicable LORS pertaining to land use.

CONDITIONS OF CERTIFICATION

Staff recommends the following deletions to the licensed project's land use conditions of certification as these conditions do not apply to the proposed amendment (Note: ~~Strikethrough~~ is used to indicate deleted language).

LAND-1 The project owner shall ensure that the project and its associated facilities are in compliance with the affected local jurisdiction's applicable adopted county or municipal code requirements for the project site's development (e.g., setbacks, zone district requirements, design criteria, height, sign requirements, etc.).

The project owner shall submit to the applicable city/county planning department for review and comment, a development plan showing site dimensions, design and exterior elevation(s) and other item(s) that may be required by the local jurisdiction's planning department to conduct a ministerial review of the project and its associated facilities in accordance with the jurisdiction's site development requirements. The city/county planning

department shall have 60 calendar days to review the plan(s) and provide written comments to the project owner. The project owner shall provide a copy of the city/county planning department's written comments and a copy of the development plan to the CPM.

Verification: At least 90 calendar days prior to the site mobilization on the power plant project site and its associated facilities, the project owner shall submit the proposed development plan to the affected jurisdiction for review and comment. The project owner shall provide any comment letters received from the local jurisdiction along with the proposed development plan to the CPM for review and approval.

LAND-2 The project owner shall identify the secured lay down/staging area(s) for the project prior to site mobilization The project owner shall provide a plot plan and location map showing the lay down/staging area(s) to the affected local jurisdiction(s) planning department(s) (i.e. County of Los Angeles, the City of El Segundo, City of Manhattan Beach, etc.) and to the Executive Director of the California Coastal Commission if located within the State designated Coastal Zone for review and comment. The local jurisdiction(s) and the Executive Director (if applicable) shall have 60 calendar days to review the lay down/staging area(s) and provide written comments to the project owner. The project owner shall provide a copy of the local jurisdiction's and the Executive Director's (if applicable) written comments and a copy of the secure lay down/staging area(s) to the CPM for review and approval.

Verification: The project owner shall provide a copy of the lay down/staging area(s) to the affected local jurisdiction and the Executive Director of the California Coastal Commission (if applicable) for written comment. At least 30 days prior to the start of site mobilization, the project owner shall provide any plan(s), map(s) showing the secured lay down and staging area(s) along with any comment letters from the local jurisdiction.

LAND-3 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-4 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 of September to May.

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-5 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 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–6 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. Following site remediation, the tank farm area shall be paved and landscaped in accordance with the landscape plan submitted and approved pursuant to condition of certification, **VIS-2**. The tank farm uses will be restricted to parking in the designated parking areas and approved uses in the paved area south of the designated parking area. Approved uses include temporary equipment staging and overflow parking during maintenance evolutions. The paved area shall not be used for permanent storage of vehicles, equipment or materials.

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-7 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–8 The project owner shall maintain lease rights for the tideland and submerged land owned by the State of California leased via the California State Lands Commission. Project owner shall provide copies to the CPM of all new or amended leases and all relevant correspondence between the project owner and the State Lands Commission regarding lease terms.

Verification: The project owner shall provide the CPM with a copy of submitted lease applications filed with the State Lands Commission and other relevant correspondence. The project owner shall submit to the CPM a copy of all new or amended lease agreements with the California State Lands Commission.

LAND–9 The project owner shall provide copies of the final perimeter landscape plan(s) to the CPM. The landscape plans shall identify the area to be designated for public use, subject to restrictions for security and public safety as determined by the CPM. The project owner shall install public park-type benches within the public use area along the west property line of the ESGS property.

Verification: The public park-type benches shall be installed pursuant to the schedule contained in Condition of Certification **VIS-2**. Within 14 days after completion of the public use area, the project owner shall contact the CPM to request a final inspection.

BIKEWAY CLOSURE OR WIDTH REDUCTION

LAND-10 The project owner shall not prohibit public access and use of the Los Angeles County maintained Class 1 bicycle trail known as the “Marvin Braude Bikeway” (bikeway) ~~during beach delivery activities~~ except as stipulated below for the project:

1. Prior to the start of pre-construction activity involving the bikeway, the project owner shall contact the Los Angeles County Department of Public Works and provide for its review a schedule for bike trail closure and trail use interruption, the detour route, the location of delineators or barricades to channelize individuals past the work site, and the placement of public signage (e.g., construction warning signs).

2. Prior to the first closure of the bikeway to perform necessary project preconstruction or construction activity, the project owner shall:
   a. Provide the final schedule and timing of bike trail closures to the Department of Public Works Construction Division and Bikeway Coordinator, and CPM,
   b. Provide a detour plan to the Department of Public Works Construction Division, Bikeway Coordinator and CPM showing a safe bicycle route around the project site for bicyclists.
   c. Provide the Department of Public Works Construction Division and Bikeway Coordinator 30-calendar days to review and provide written comments to the project owner on a. and b. above.
   d. Provide to the CPM a copy of the transmittal letter submitted to the Department of Public Works Construction Division and Bikeway Coordinator requesting their review of the items identified in a. and b. above.
   e. Provide to the CPM a copy of the Department of Public Works Construction Division and Bikeway Coordinator written comments on the items identified in a. and b. above for approval.
   f. Notify the Bikeway Coordinator within 24-hours after any reopening of the bikeway.
3. If the bikeway's existing width must be reduced in size to perform necessary project construction activity, the project owner shall provide the following: Eight (8) feet of bicycle trail width shall be maintained around the project site to the greatest extent possible. The project owner shall post construction signs warning "CONSTRUCTION AHEAD" and "BIKEWAY NARROWS" in advance of the project site on all approaches along with delineators and barricades for channelization. If a minimum of eight feet of paved bicycle trail cannot be provided, construction signs warning "CONSTRUCTION AHEAD" and "WALK BIKE" shall be posted in advance of the project site on all approaches. Where bicyclists are instructed to walk their bikes, flagmen shall be present at all approaches. Delineators or barricades shall also be placed to channelize pedestrians past the work site. Vertical clearance to obstructions across the clear width of the bicycle trail shall be a minimum of 8 feet.
4. Required public signage shall be posted at least 14-calendar days prior to the start of pre-construction activity involving the bikeway. The Department of Public Works Construction Division and Bikeway Coordinator, and the CPM shall be notified that signage has been installed within 24-hours after posting.
5. To the extent feasible, the project owner shall make the bicycle trail open to the public on weekends and holidays. The bicycle trail shall be completely free of obstructions including barricades, swept clean, and have a minimum of eight-feet of vertical clearance with a two-foot wide

shoulder. If a two-foot wide shoulder cannot be maintained, the project owner shall provide warning signage.

6. Within 48-hours after receiving a bicycle related trail complaint specific to the project's bikeway pre-construction and construction activities, the project owner shall provide the CPM with a complaint resolution form report as specified in the Compliance General Conditions and a written explanation of the resolution to the complaint.

Verification: At least 30 days prior to start of pre-construction activity involving the bikeway, the project owner is to contact the Los Angeles County Department of Public Works Construction Division and Bikeway Coordinator.

The project owner is to provide to the CPM a copy of the transmittal letter submitted to the Department of Public Works Construction Division and the Bikeway Coordinator requesting their review.

The project owner is to provide to the CPM a copy of the written comments provided by the Department of Public Works Construction Division and the Bikeway Coordinator on the scheduled for bike trail closure and trail use interruption, the detour route, the installation of public signage and notification.

The project owner is to notify the Construction Division, Bikeway Coordinator, and the CPM within 24-hours after posting signage along the bicycle trail.
The project owner is to notify the Bikeway Coordinator within 24-hours after any reopening from a scheduled closure of the bicycle trail.

Within 48-hours after receiving a bicycle related trail complaint, the project owner is to provide the CPM with a complaint resolution form report and resolution explanation.

BIKEWAY RESTORATION

LAND-11 The project owner shall complete restoration or repair of bicycle trail pavement (including striping) to the bikeway's preconstruction condition consistent with the schedule established for the completion of the seawall pursuant to Condition of Certification VIS-3 found in the visual resources section of the Commission Decision dated February 2, 2005. The project owner shall contact the Los Angeles County Department of Public Works Construction Division and the CPM for a site inspection after the project owner has restored/repaired the bicycle trail to its preconstruction condition. If upon completion of the site inspection by the Los Angeles County Department of Public Works Construction Division and the CPM, the CPM notifies the project owner that additional restoration/repair is needed within 30 days of receiving the notification the project owner shall complete the specified work.

Verification: The project owner is to notify the Los Angeles County Department of Public Works Construction Division and the CPM upon completion of the restoration/repair of the bicycle trail that it is ready for inspection.

BEACH RESTORATION

LAND-12 The project owner shall remove all evidence of the project's beach delivery area structures and equipment (e.g., beach ramp, safety/security fencing, dozers, etc.), and restore the beach surface area to its original condition or better condition, including the replacement of any sand, vegetation, or paving that was removed to permit the project's beach delivery phase where project development does not preclude it.

The project owner shall record in video format the beach delivery lay down area prior to pre-construction activity and after the restoration completed. The project owner shall submit copies of both the pre- and post-video recordings to the CPM.

The project owner shall complete surface restoration of the beach area within 60 calendar days after the start of commercial operation. The project owner shall notify the CPM within seven days after completion of surface restoration that the beach area is ready for inspection. If the CPM notifies the project owner that additional surface restoration is needed after the site inspection, within 30 days of receiving that notification the project owner shall complete the specified work.

Verification: At least 15 days prior to the start of pre-construction on the beach, the project owner is to video the beach delivery laydown area and provide a copy of it to the CPM.

The project owner is to notify the CPM within seven days after completion of the beach restoration that it is ready for inspection and provide the CPM with a video/DVD showing the restored beach area.

CALIFORNIA STATE LANDS COMMISSION LEASE

LAND-13 Prior to the start of the project's pre-construction activity on the beach, the project owner shall provide the CPM a copy of their executed lease or equivalent land use document with the California State Lands Commission permitting barge anchorage, and the storage and transfer of oversized power plant equipment (e.g., steam turbine generators, heat recovery steam generators, air-cooled condensers) to the project site.

Verification: At least 15 days prior to the start of pre-construction activity on the beach, the project owner is to provide the CPM a copy of their executed lease or equivalent land use document with the California State Lands Commission.

EMERGENCY SERVICE VEHICLE AND EQUIPMENT PASSAGE

LAND-14 The project owner shall allow the Los Angeles County Department of Beaches and Harbors, Facilities and Property Management Division, and the Los Angeles County Fire Department, Lifeguard Division, heavy equipment and emergency services vehicle passage through the project's beach delivery area, and the Marvin Braude Bikeway to respond to beach related

emergencies (e.g.; oil spills, sewage spillage fouling the shoreline, beach erosion, high tides, mammal rescue), and to conduct lifesaving operations and paramedic services.

Prior to the start of pre-construction activity on the beach, if the project owner cannot provide heavy equipment/emergency services vehicle passage, the project owner may submit to the CPM for approval an alternative option that provides for the movement of heavy equipment and emergency services vehicles that has been reviewed by the Chief of Facilities and Property Management Division for the Los Angeles County Department of Beaches and Harbors and the Chief Lifeguard of the Los Angeles County Fire Department.

If the CPM determines that the heavy equipment/emergency services vehicle passage or the alternative option requires a revision, the project owner shall revise the heavy equipment/emergency services vehicle passage or alternative option and submit it to the CPM for approval.

The heavy equipment/emergency services vehicle passage or alternative option shall remain in effect until the beach ramp and fencing prohibiting passage of heavy equipment and emergency service vehicles through the project's beach delivery area are cleared from the beach.

Verification: At least 30 calendar days prior to the start of the project's pre-construction activity on the beach, the project owner is to contact the Chief of Facilities and Property Management Division for the Los Angeles County Department of Beaches and Harbors, and the Chief Lifeguard of the Los Angeles County Fire Department to formalize the heavy equipment/emergency services vehicles passage or alternative option.

At least 10 days prior to the start of pre-construction activity on the beach, the project owner is to provide to the CPM a map showing the agreed upon heavy equipment/emergency services vehicle passage or alternative option.

REFERENCES

CDMV 1977- California Vehicle Code, section 21966, *Pedestrian in Bicycle Lane*, January 1, 1977.

CEC 2005a- CEC (CEC-800-2005-001-CMF). El Segundo Power Redevelopment Project Commission Decision, dated 2/2005.

CEC 2010a- CEC (CEC-800-2010-015). El Segundo Power Redevelopment Project Amendment Commission Decision, dated 6/2010.

ES 2013a- City of El Segundo General Plan 1992, http://www.elsegundo.org/depts/planningsafety/planning/general_plan/gptoc.asp, 2013.

ES 2013b- City of El Segundo Municipal Code, Title 15 Zoning Regulations, http://www.sterlingcodifiers.com/codebook/index.php?book_id=587, 2013.

CEC 2013a- CEC / C. Marxen (TN 70818). Notice of Receipt for the Petition to Amend, dated 5/14/2013. Submitted to CEC on 4/23/2013.

LA 2013a- City of Los Angeles, Title 12 Zoning Regulations, http://cityplanning.lacity.org/,2013

NRG 2012a- NRG / El Segundo Energy Center LLC (TN 20650) Petition to Amend, dated April 2012. Submitted to CEC on 04/17/2012.

LAC 2014- County of Los Angeles Department of Public Works, *Bikeway Map*, posted 2012, < http://dpw.lacounty.gov/pdd/bike/map.cfm>, accessed June 5, 2014.

LL 2013e- Locke Lord / J. McKinsey (TN 200464). Applicant's Responses to Data Requests in Set One (#1-83). Submitted to CEC on 9/12/2013.

NRG 2013a- NRG / El Segundo Energy Center LLC (TN 70442) Petition to Amend, dated April 2013. Submitted to CEC on 04/23/2013.

NRG 2012a- NRG / El Segundo Energy Center LLC (TN 20650) Petition to Amend, dated April 2012. Submitted to CEC on 04/17/2012.

NRG 2013a- NRG / El Segundo Energy Center LLC (TN 70442) Petition to Amend, dated April 2013. Submitted to CEC on 04/23/2013.

NOISE AND VIBRATION

Testimony of Edward Brady and Shahab Khoshmashrab

SUMMARY OF CONCLUSIONS

The demolition and removal of El Segundo Generating Station (ESGS) Units 3 and 4 and the installation and operation of new El Segundo Energy Center (ESEC) Units 9 through 12 would result in similar grading, excavation, foundation, and underground infrastructure activities as were required for the demolition of ESGS Units 1 and 2 and the construction of ESEC Units 5 through 8 under the original California Energy Commission (Energy Commission) Decision (Decision) (CEC 2005a). Thus, the El Segundo Power Facility Modification (ESPFM) demolition, construction, and operations, would be conducted in accordance with the existing Conditions of Certification **NOISE-1** through **NOISE-10** established by the 2005 Decision.

If built and operated in conformance with the existing conditions of certification shown below, staff believes that the ESPFM Petition to Amend (PTA) would comply with all applicable noise and vibration laws, ordinances, regulations and standards (LORS). This PTA does not alter the assumptions and conclusions in the original Decision and no additional or revised LORS requirements have been identified since the original Decision. Staff concludes that the project would produce no significant direct or cumulative adverse noise impacts under the California Environmental Quality Act (CEQA) guidelines on people within the project area, including minority populations, directly, indirectly, or cumulatively.

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's produced, and the proximity of the facility to sensitive receptors, all combine to determine whether the facility would meet applicable noise control LORS and whether it would cause significant adverse environmental impacts. In some cases, vibration may be produced as a result of power plant construction practices such as blasting or pile driving. The ground-borne energy of vibration has the potential to cause structural damage and annoyance.

On April 23, 2013, El Segundo Energy Center, L.L.C. (petitioner) filed the ESPFM PTA with the Energy Commission, requesting to replace utility boiler Units 3 and 4 with one new combined cycle train consisting of one natural gas turbine generator (Unit 9), one heat recovery steam generator (HRSG), and one steam turbine generator (Unit 10), and two new simple-cycle gas turbines (Units 11 and 12), totaling 449 megawatts (MW gross).

The purpose of this analysis is to identify and examine the likely noise and vibration impacts from the construction and operation of the ESPFM project as the result of this PTA. Staff recommends procedures to ensure that the resulting noise and vibration impacts would be adequately mitigated to comply with applicable LORS and to lessen

the impacts to less than significant. For an explanation of technical terms used in this section please refer to **Noise Appendix A** immediately following.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

Noise Table 1
Laws, Ordinances, Regulations and Standards

<table>
<tr><th>Applicable Law</th><th>Description</th></tr>
<tr><td><u>Federal</u>:
Occupational Safety & Health Act (OSHA): 29 U.S.C. § 651 et seq

U.S. Environmental Protection Agency (USEPA)</td><td>Protects workers from the effects of occupational noise exposure.

Assists state and local government entities in development of state and local LORS for noise.</td></tr>
<tr><td><u>State:</u>
California Occupational Safety & Health Act (Cal-OSHA): 29 U.S.C. § 651 et seq., California Code of Regulations, Title 8, §§ 5095-5099</td><td>Protects workers from the effects of occupational noise exposure.</td></tr>
<tr><td><u>Local:</u>
City of El Segundo Municipal Code, Noise Control Ordinance, Chapter 9.06

City of Manhattan Beach Municipal Code, Noise Control Ordinance, Chapter 5.48</td><td>Prohibits the creation of noise within the city which causes the existing noise level when measured at the receptor to exceed 5 dBA above the ambient noise level (for residential properties) or 8 dBA above the ambient noise level (for industrial properties).

Increases to the noise standards may be permitted as shown below
<table>
<tr><th>Permitted Increase, dBA</th><th>Duration of Increase *</th></tr>
<tr><td>0</td><td>30 (minutes)</td></tr>
<tr><td>5</td><td>15 (minutes)</td></tr>
<tr><td>10</td><td>5 (minutes)</td></tr>
<tr><td>15</td><td>1 (minutes)</td></tr>
<tr><td>20</td><td>Less than 1(minute)</td></tr>
<tr><td colspan="2">* Cumulative minutes during any one hour</td></tr>
</table>
Noise level standards at residential properties are shown below:
<table>
<tr><th rowspan="2">Descriptor</th><th colspan="2">Allowable Noise Level, dBA</th></tr>
<tr><th>7:00 a.m. to 10:00 p.m.</th><th>10:00 p.m. to 7 :00 a.m.</th></tr>
<tr><td>L_{50} (30 minutes/hour)</td><td>50</td><td>45</td></tr>
<tr><td>L_{25} (15 minutes/hour)</td><td>55</td><td>50</td></tr>
<tr><td>L_{8} (5 minutes/hour)</td><td>60</td><td>55</td></tr>
<tr><td>L_{2} (1 minute/hour)</td><td>65</td><td>60</td></tr>
<tr><td>L_{0} (maximum)</td><td>70</td><td>65</td></tr>
<tr><td>L_{eq} (equivalent)</td><td>55</td><td>50</td></tr>
</table>
In addition, Section 5.48.060 of this code restricts construction to: 7:30 a.m. and 6:00 p.m. Monday through Friday, and 9:00 a.m. and 6:00 p.m. Saturdays.</td></tr>
</table>

FEDERAL

Under the Occupational Safety and Health Act of 1970 (OSHA) (29 U.S.C. § 651 et seq.), the Department of Labor, Occupational Safety and Health Administration, (OSHA) adopted regulations (29 C.F.R. § 1910.95) designed to protect workers against the effects of occupational noise exposure. These regulations list permissible noise exposure levels as a function of the amount of time during which the worker is exposed (see **Noise Appendix A, Table A4**, immediately following this section). The regulations further specify a hearing protection 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.

Guidelines are available from the U.S. Environmental Protection Agency (USEPA) to assist state and local government entities in developing state and local LORS for noise. Because there are existing local LORS that apply to this project, the USEPA guidelines are not applicable.

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 vibrational decibels (VdB), which correlates to a peak particle velocity of about 0.002 inches per second (in/sec). The FTA measure of the threshold of architectural damage for conventional sensitive structures is 100 VdB, which correlates to a peak particle velocity of about 0.2 in/sec.

STATE

California Government Code Section 65302(f) encourages each local governmental entity to perform noise studies and implement a noise element as part of its general plan. In addition, the California Office of Planning and Research has published guidelines for preparing noise elements, which include recommendations for evaluating the compatibility of various land uses as a function of community noise exposure.

The State of California, Office of Noise Control, prepared the Model Community Noise Control Ordinance, which provides guidance for acceptable noise levels in the absence of local noise standards. This model also defines a simple tone, or "pure tone," as one-third octave band sound pressure levels that can be used to determine whether a noise source contains annoying tonal components. The Model Community Noise Control Ordinance further recommends that when a pure tone is present, the applicable noise standard should be lowered (made more stringent) by five A-weighted decibels (5 dBA).

The California Occupational Safety and Health Administration (Cal-OSHA) has promulgated occupational noise exposure regulations (California Code of Regulations, Title 8, §§ 5095-5099) that set employee noise exposure limits. These standards are equivalent to 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 properties) or 8 dBA above the ambient noise level (for industrial properties). 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 2**.

Noise Table 2

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 2** as measured on the residential receptor's 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 3
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 of Manhattan Beach has interpreted its ordinance to allow operational noise to exceed the ambient L_{50} level by no more than 2 dBA. Consequently, the original Decision has required the project to meet this 2 dBA requirement (CEC 2005, p. 134, Condition of Certification **NOISE-6**).

- 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 L_{50} 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 proposed PTA is for decommissioning, demolishing, and replacing the existing Units 3 and 4 steam boiler plants with approximately 449 MW gross / 435 MW net of new natural-gas-fired electrical generating capacity, consisting of one combined cycle train and two simple cycle gas turbines. The PTA replaces the once-through seawater cooling system with dry-cooling technologies. The equipment that has the greatest potential to generate significant noise levels during plant operation includes the gas and steam turbines, heat recovery steam generators (HRSGs), pumps, motors, main transformers, and fin fan air coolers.

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 ESPFM would be located within the existing ESEC site, where Units 3 and 4 are located. Land uses in the project vicinity include recreational, residential, commercial, school and business uses.

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

Assessment of impacts and discussion of mitigation below includes methods and thresholds for determining significance based on the California Environmental Quality Act (CEQA) guidelines, determination of compliance with applicable noise and vibration LORS, and discussion of mitigation measures to ensure compliance with CEQA and applicable LORS.

METHODS AND THRESHOLDS FOR DETERMINING SIGNIFICANCE

California Environmental Quality Act (CEQA)

The CEQA requires that significant environmental impacts be identified and either eliminated or mitigated to the extent feasible. Section XII of Appendix G of CEQA's

guidelines (California Code of Regulations, Title 14, Appendix G) describes some characteristics that could 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 ground borne vibration or ground borne noise levels;
3. Substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project; or
4. 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 3 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 more than 5 dBA at the nearest sensitive receptor, including those receptors that represent the area's minority population.

Staff has concluded that an increase in background noise levels up to and including 5 dBA in a residential setting is insignificant; an increase of more than 10 dBA, however, is clearly significant. An increase of between 5 and 10 dBA should be considered adverse, but could be either significant or insignificant, depending upon the circumstances of a particular case.

Factors to be considered in determining the CEQA significance of an adverse impact as defined above include:

1. the resulting noise level;
2. the duration and frequency of the noise;
3. the number of people affected; and
4. the land use designation of the affected receptor sites.

Noise due to construction activities is usually considered to be less than significant in terms of CEQA compliance if:

- the construction activity is temporary; and
- the use of heavy equipment and noisy[32] activities is limited to daytime hours.

Staff uses the above method and threshold to protect the most sensitive populations. The most sensitive receptors includes the environmental justice population; that is, the area's minority population. For purposes of evaluating impacts on residential uses, the project noise is compared with measured nighttime ambient noise levels, when most residents are trying to sleep.

[32] Noise that draws a complaint.

Ambient Noise Monitoring

In order to predict the likely noise effects of the project on adjacent sensitive receptors, the project owner 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).

Because of the importance of defining the ambient noise levels in implementing the LORS, the project owner conducted additional noise measurements and an extensive, detailed, noise modeling exercise, and submitted a report to the Energy Commission concerning that analysis in December 2001. This analysis included a series of 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.

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.

Furthermore, the December 2001 noise analysis showed that it is possible to reliably measure surf noise on the project site exclusive of other influences. This offered the opportunity to provide preconstruction baseline noise measurements against which to compare noise levels measured after the original project was implemented. For example, it was 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. This preconstruction noise survey was completed in 2003 in accordance with Condition of Certification **NOISE-6** and the results established the existing ambient baseline at residences adjacent to the south project boundary.

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 along 45th Street. 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 above 2000, 2001, and 2003 surveys still represent the ambient noise environment in the vicinity of the project site, as no meaningful changes that would measurably affect the noise environment have occurred since then. Thus, baseline levels remain unchanged and are to be used for the compliance of this PTA with the applicable noise LORS.

The most noise-sensitive receptors identified in the original Decision remain the project's most noise-sensitive receptors. These receptors are identified as ST-2 and ST-3 in the Decision (as described in the AFC, Section 5.12, Figure 5.12-3, as amended May 4, 2001, shown below as **Noise Figure 1**).

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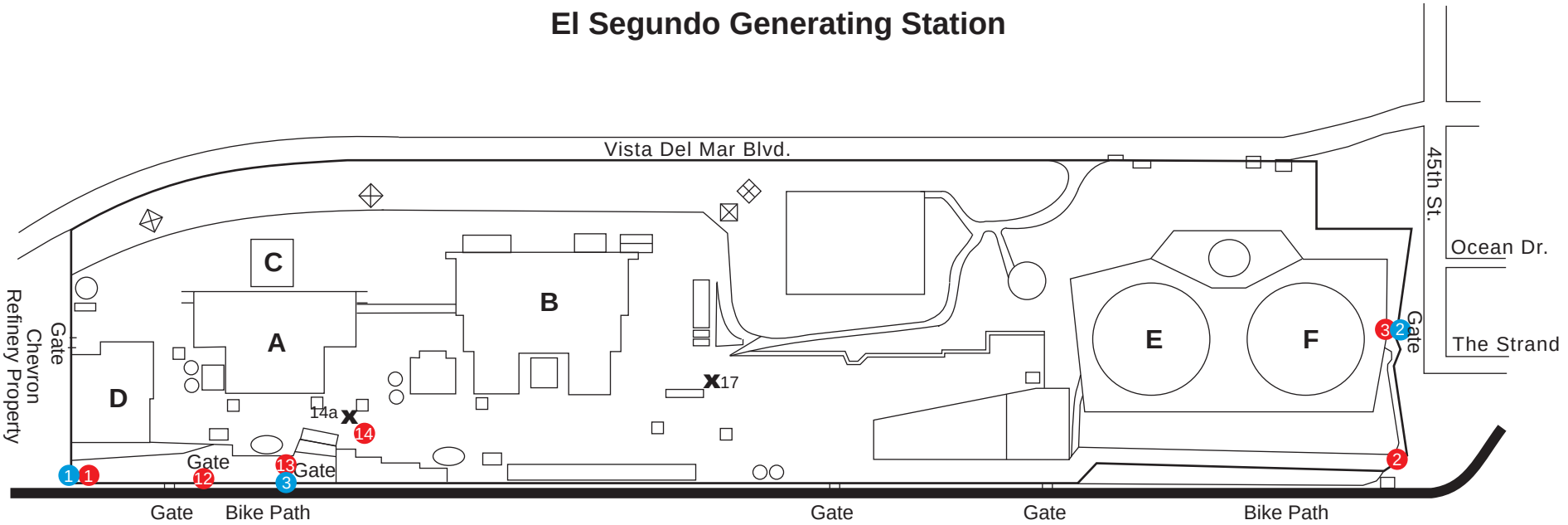
El Segundo Generating Station



LEGEND

- 1 Long-Term Measurement Site
- 1 Short-Term Measurement Site
- x Spectral Noise Measurement Site
- **A** Units 1 & 2
- **B** Units 3 & 4
- **C** Administration Building
- **D** Warehouse & Maintenance Shop
- **E** North Fuel Oil Tank

El Segundo Power Redevelopment Project **El Segundo Power II LLC**	**Figure 5.12-3.** NOISE MEASUREMENT LOCATIONS INSIDE PROPERTY BOUNDARIES	2000

DIRECT IMPACTS AND MITIGATION

Noise impacts associated with the project can be created by construction activities and normal operation of the project.

Construction Impacts and Mitigation

Construction noise is usually a temporary phenomenon (typical power plant construction lasts 1-2 years). Construction and startup of the ESPFM from site mobilization to commercial operation is expected to take a minimum of 20 months (NRG 2013a, § 2.8). The demolition and removal of Units 3 and 4 and the installation and operation of new Units 9 through 12 would result in similar grading, excavation, foundation, and underground infrastructure activities as were required for the demolition of Units 1 and 2 and the construction of Units 5 through 7 under the original Decision (CEC 2005a). Construction of the ESPFM is expected to be typical of similar projects in terms of equipment used and types of activities. 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.

The petitioner will perform construction work during the times specified in the city of Manhattan Beach Municipal Code and in compliance with the noise level limit of 65 dBA L_{50} for construction and demolition activities as required by the city of El Segundo Municipal Code (NRG 2013a, §§ 3.7.3, 3.7.7). The existing Condition of Certification **NOISE-8** would ensure that these requirements are met. Therefore, the noise impacts of the ESPFM construction and demolition activities would comply with the noise LORS.

Based upon the potential noise impacts of construction and demolition noise, staff maintains the existing Conditions of Certification, **NOISE-1** and **NOISE-2**, to monitor and mitigate potential construction and demolition noise impacts as the result of the ESPFM. 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 project area are considered to be less than significant.

This PTA does not alter the assumptions and conclusions in the original Decision and no additional or revised LORS requirements have been identified since the original Decision.

Linear Facilities

The ESPFM includes no new linear facilities. Therefore, no significant noise effects are expected.

Vibration

The construction equipment for pile driving may produce vibration that could be perceived off site. In compliance with the El Segundo Municipal Code, 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 any vibration created does not endanger the public health, welfare and safety. To ensure that vibration would be performed in this manner, staff maintains the existing Condition of Certification

NOISE-9. **NOISE-9** requires construction equipment to not exceed a vibration threshold of 0.003 in/sec. As explained above (see **LAWS, ORDINANCES, REGULATIONS, AND STANDARDS**), the FTA measure of the threshold of architectural damage for conventional sensitive structures is 0.2 in/sec. As clearly seen here, compliance with **NOISE-9** would ensure no vibration-related structural damage would occur. Note that in general, today's modern power plant equipment is very unlikely to cause structural damage offsite.

Worker Effects

The project owner acknowledges the need to protect construction workers from noise hazards. Similar to the original proceedings, the project owner recognizes those applicable LORS that would protect construction workers, and commits to complying with them (NRG 2013a, §§ 3.7.3, 3.7.7). To ensure that construction workers are, in fact, adequately protected, staff maintains the existing Condition of Certification **NOISE-3**.

Steam Blows

Typically, the loudest noise encountered during construction, inherent in building any project incorporating a steam turbine, is created by the steam blows. After erection and assembly of the feed water and steam systems, the piping and tubing that comprise the steam path have accumulated dirt, rust, scale, and construction debris such as weld spatter, dropped welding rods, and the like. If the plant were started up without thoroughly cleaning out these systems, all this debris would find its way into the steam turbine, quickly destroying the machine.

In order to prevent this, before the steam system is connected to the turbine, the steam line is temporarily routed to the atmosphere. Traditionally, high pressure steam is then raised in the boiler or a temporary boiler and allowed to escape to the atmosphere through the steam piping. This flushing action, referred to as a "high pressure steam blow", is quite effective at cleaning out the steam system. A series of short steam blows, lasting two or three minutes each, are performed several times daily over a period of two or three weeks. At the end of this procedure, the steam lines are connected to the steam turbine, which is then ready for operation. Alternatively, high pressure compressed air can be substituted for steam.

High pressure steam blows, if un-silenced, can typically produce noise levels as high as 129 dBA at a distance of 50 feet; this creates the potential to cause annoyance at the project's noise-sensitive receptors. Therefore, staff believes that steam blow noise should be mitigated to the maximum feasible extent. A quieter steam blow process, referred to as "low-pressure steam blow" has become popular. This method utilizes lower pressure steam over a continuous period of about 36 hours. Resulting noise levels reach about 86 dBA at 50 feet. Alternative low-pressure steam blow technology currently exists, and is economically feasible, as demonstrated by its use for other recently approved power plant projects. Similar to the original Decision, steam blows for ESPFM would be performed in compliance with the existing Condition of Certification **NOISE-4** that requires low-pressure steam blows and Condition of Certification **NOISE-5** that makes neighbors aware of scheduled steam blows.

Operation Impacts and Mitigation

Power plant noise is unique. A power plant may operate as essentially, a steady, continuous, broadband noise source. Under load following duty, the power plant noise may be intermittent and start-up at random times.

The operation of new Units 9 through 12 would result in similar noise levels as the existing Units 5 through 8 under the original Decision (CEC 2005a). Similar to the original project, there would 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. Staff maintains the existing conditions of certification related to plant operation. Specifically, these conditions include: **NOISE-1** (property owner notification of start of project), **NOISE-2** (documentation and resolution of noise complaints), **NOISE-6** (compliance with noise standards), **NOISE-7** (occupational noise survey), and **NOISE-9** (operational vibration monitoring). The operation of the power plant includes notification of outside workers using a loudspeaker system. The existing conditions of certification include **NOISE-10** which restricts the use of the loudspeaker system to only testing and emergencies. Staff maintains this condition of certification. See below for additional analysis.

Compliance with LORS

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 ESPFM would represent 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, HRSGs, transformers, boiler feed pumps, circulating water pumps, fin fan coolers and gas compressors.

Condition of Certification **NOISE-6** in the original Decision limits increases in ambient noise levels due to power plant noise at the nearest residential receptors (dwellings in Manhattan Beach, immediately south of the project boundary) to 2 dBA (represented by ST-2 and ST-3). **NOISE-6** also requires that noise due to the plant operations would not exceed the standards of the El Segundo and Manhattan Beach Municipal Codes.

As explained above, the most noise-sensitive receptors identified in the original Decision remain the project's most noise-sensitive receptors. These receptors are identified by monitoring locations ST-2 and ST-3 in the Decision (as described in the AFC, Section 5.12, Figure 5.12-3, as amended May 4, 2001, shown above as **Noise Figure 1**). **NOISE-6** requires a post-construction noise monitoring at these locations to ensure project compliance with the LORS.

The ESPFM PTA does not alter the assumptions and conclusions in the original Decision and no additional or revised LORS requirements have been identified since the original Decision. With implementation of these conditions of certification, noise due to project operation would comply with the applicable LORS.

CEQA Impacts

Staff typically compares projected power plant noise to existing ambient background noise levels at affected sensitive receptors. If this comparison identifies a significant adverse impact, then feasible mitigation must be applied to the project to either reduce or remove that impact. The noise impacts resulting from implementation of this PTA would be similar to those currently existing in the project area.

Staff regards an increase of up to 5 dBA in the existing ambient background noise as a less-than-significant impact. A permanent/long-term increase of above 5 dBA at night, when most people are trying to sleep, is significant at residential receptors (see **METHODS AND THRESHOLDS FOR DETERMINING SIGNIFICANCE** above). The city of Manhattan Beach requires 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 existing Condition of Certification **NOISE-6** would ensure this. **NOISE-6** requires that following construction and startup of the project, the project owner monitor actual noise levels at the sensitive receptors to verify that any increase in noise levels is limited to no more than 2 dBA. Should project noise be too great, the project owner would be required to make any necessary changes in order to achieve compliance. Attaining compliance with this requirement 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.

Staff believes that no significant noise impacts are likely to occur due to the operation of the project, as mitigated.

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 project owner has stated that no strong tonal noises would be generated during the operation of the project.

Emergency pressure safety valves, also called “steam relief valves”, would likely be installed on the HRSG. Staff does not have an estimate of the noise levels associated with the steam system vents at the nearest receptors. Emergency pressure safety valve discharges are typically not silenced, and produce noise only under emergency conditions. Given the distance from the steam 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, staff maintains the existing Condition of Certification **NOISE-6**, which requires the project owner to mitigate pure tones and the noise from steam relief valves.

Linear Facilities

The ESPFM includes no new linear facilities. Therefore, no significant noise effects are expected.

Vibration

Vibration from an operating power plant could be transmitted through two primary means: ground (ground-borne vibration), and air (airborne vibration).

The operating components of a combined cycle power plant consist of high-speed gas turbines, heat recovery steam generator, steam turbines, compressors, and various pumps. All of these pieces of equipment must be carefully balanced in order to operate; permanent vibration sensors are attached to the turbines and generators. Gas turbine generator facilities using the General Electric 7FA and Rolls Royce 60 systems have not resulted in ground-borne or airborne vibration impacts.

Airborne vibration (low frequency noise) can rattle windows and objects on shelves, and can rattle the walls of lightweight structures. The ESPFM's chief source of airborne vibration would be the gas turbines' exhaust. In this power plant, however, the exhaust must pass through the selective catalytic reduction (SCR) modules and the stack silencers before it reaches the atmosphere. The SCRs act as efficient mufflers. The combination of SCR units and stack silencers makes it highly unlikely that the ESPFM would cause perceptible airborne vibration effects.

However, to ensure that project operation would not cause perceptible vibration, staff maintains Condition of Certification **NOISE-9**, which requires that operational vibration be monitored and any related complaints be resolved.

Worker Effects

The petitioner recognizes the need to protect plant operating and maintenance personnel from noise hazards, and has committed to comply with applicable LORS (NRG 2013a, §§ 3.7.3, 3.7.7). 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 petitioner would implement a comprehensive hearing conservation program. To ensure that workers are, in fact, adequately protected, staff maintains the existing Condition of Certification **NOISE-7**, which requires an occupational noise survey, and if necessary, identify mitigation measures that would be employed to comply with the applicable California and federal regulations.

CUMULATIVE IMPACTS AND MITIGATION

Section 15130 of the CEQA guidelines (California Code of Regulations, Title 14) requires a discussion of cumulative environmental impacts. Cumulative impacts are two or more individual impacts (from existing and/or reasonably foreseeable projects) that, when considered together, compound or increase other environmental impacts. CEQA guidelines require that this discussion reflect the severity of the impacts and the likelihood of their occurrence, but do not need to provide as much detail as the discussion of impacts solely attributable to the project.

The proposed ESPFM would not result in any significant cumulative noise impacts beyond those addressed in the original Decision (CEC 2005a). The petitioner states that as part of preparation of this PTA, the relevant planning agencies were contacted and confirmed that there are no planned actions that would interfere with maintaining conformance of the ESEC with noise regulations and, therefore, there would be no cumulative impacts (NRG 2013a, § 3.7.5). The petitioner has pledged to continue to work closely with the cities of El Segundo, Manhattan Beach, and Los Angeles, and Los Angeles County to monitor and anticipate any future community organized events such as charity walks, bike rides, or clean-ups to minimize potential noise impacts to bike path users from construction or operation of the project (NRG 2013a, § 3.7.5).

FACILITY CLOSURE

All operational noise from the project would cease when the ESPFM project closes, and no further adverse noise impact from its operation would be possible. The remaining potential temporary noise source would be the dismantling of the project structures and equipment, as well as any site restoration work that may be performed. Since this noise would be similar to that caused by the original construction, it could be similarly treated - that is, noisy work could be performed during daytime hours with machinery and equipment that are properly insulated and/or equipped with mufflers. Any noise LORS in existence at that time would apply. Unless modified, applicable conditions of certification included in the original Decision would also apply.

NOTEWORTHY PROJECT BENEFITS

The new Units 9-12 incorporate the state of the art technology in terms of noise pollution; they incorporate acoustical features that were not incorporated in, or available for, the older boiler Units 3-4 they would replace. Therefore, the overall project would emit less noise than the existing project.

RESPONSES TO PUBLIC AND AGENCY COMMENTS

Since the publication of the Preliminary Staff Assessment, staff has received the following public comments regarding **Noise and Vibration**; staff has not received any agency comments.

Comments from Michelle Murphy (Murphy 2014):

Comment: Michelle Murphy, a resident in the residential community adjacent to the project's southern boundary, south of 45th Street, requested that operational noise measurements similar to those required last time (in the original Decision for Units 5 through 8) be required again and that a noise measuring device be placed at her property to continuously monitor construction noise and avoid having someone come to her property to take noise measurements on daily basis.

Staff's Response: Continuous noise measurements during operations, similar to those required in the original Decision, would be required for ESPFM, in compliance with

Condition of Certification **NOISE-6**. **NOISE-6** requires a 30-day continuous operational noise survey at a location representing the residences south of 45th Street.

Typically, continuous, long-term monitoring of noise requires the use of an unmanned noise monitoring device. Power plant operational noise is typically steady and uniform in nature, and thus, long-term unmanned monitoring is appropriate in this instance, as there is no need to momentarily monitor the recorded noise data to pin point the source(s) of fluctuating noise. On the other hand, demolition and construction noise are highly variable and can be mistaken for other intermittent noise sources present in the area, if no one is present to momentarily analyze the sound data. Therefore, an unmanned device is not appropriate for measuring construction and demolition noise levels. The presence of a qualified noise monitoring officer during measurements ensures the source(s) of excessive noise is better identified and any resultant noise issues can thus be more appropriately addressed. Staff maintains that short-term measurements attended by qualified personnel are more appropriate for monitoring demolition and construction noise than unmanned long-term, continuous measurements.

Comment: Michelle Murphy asked that the project owner be required to provide sound dampening windows to those residents who would be affected by construction and operation noise from the ESPFM project.

Staff's Response: Based on staff's experience with various power plant projects, the various factors affecting sound propagation, and the variable nature of human response to unwanted sound, or noise, it is best to carefully study the issue to determine proper mitigation measures for remediating the cause of excessive noise, prior to formulating a specific mitigation measure. Generally, it is most appropriate and most effective to reduce the noise at its source (i.e.; construction activities or operational equipment), but sometimes it is best to mitigate the impact at the receiver.

Determining which method(s) of noise mitigation to employ should be done after the character of the noise, its source(s), and the number and locations of the affected receptors are identified. Then, a host of mitigation options would need to be studied and a feasible option would need to be selected that would result in benefiting the surrounding community as a whole as opposed to one receptor location only.

Therefore, staff does not recommend specific mitigation measures in the conditions of certification because they may prove to be inappropriate or ineffective. Instead, staff recommends that any mitigation measures for construction-related work be considered after the source(s) of excessive noise are identified. Staff also relies on Condition of Certification **NOISE-2**, which requires a noise complaint resolution process to appropriately respond to and resolve each noise complaint on a case-by-case basis to the satisfaction of the complainant.

CONCLUSIONS

The demolition and removal of Units 3 and 4 and the installation and operation of new Units 9 through 12 would result in similar grading, excavation, foundation, and

underground infrastructure activities as were required for the demolition of Units 1 and 2 and the construction of Units 5 through 8 under the original Decision (CEC 2005a). Thus, the ESPFM demolition, construction, and operations would be conducted in accordance with the existing Conditions of Certification **NOISE-1** through **NOISE-10** established by this Decision.

If built and operated in conformance with the existing conditions of certification, provided below, staff believes that this PTA would comply with all applicable noise and vibration LORS. This PTA does not alter the assumptions and conclusions in the original Decision and no additional or revised LORS requirements have been identified since the original Decision. Staff concludes that the project would produce no significant direct or cumulative adverse noise impacts under CEQA guidelines on people within the project area, including the minority populations, directly, indirectly, or cumulatively.

PROPOSED CONDITIONS OF CERTIFICATION

At the PSA workshop, Michelle Murphy, the project owner, and staff discussed the need to adjust Condition of Certification **NOISE-8** to reflect the changed conditions at the project site since the original **NOISE-8** was agreed upon by all parties. Namely, the fuel oil storage tanks (FOSTs) that used to dominate the southern portion of the project site have been removed, as specified in the original Decision on ESEC. As a result, **NOISE-8**'s specified use of the FOSTs in providing partial noise blockage from the project, at the noise-sensitive receptors south of the project boundary, can no longer be followed. Therefore, the project owner proposes that a new figure be provided to replace the figure in **NOISE-8** that showed the FOSTs.

In the original **NOISE-8**, the project was broken down into four phases:

Phase I: Tank Preparation Period

Phase II: Demolition Period (Demolition of Units 1 and 2)

Phase III: Construction Period (meaning construction of Units 5, 6, 7 and 8)

Phase IV: Operations Period (meaning the operation of Units 5, 6, 7 and 8).

The project owner suggests adding a new Phase V that would apply to the demolition and removal of Units 3 and 4, and construction of Units 9, 10, 11 and 12.

Staff agrees with these proposed changes and has revised **NOISE-8** accordingly. That is, the figure in **NOISE-8** has been replaced, and the language pertaining to Phase V has been added to **NOISE-8**.

The following revisions to the conditions of certification in the original Decision include the changes made in the PSA. They include the following: the addition of new Units 9-12 to the compliance requirements of operational noise in Condition of Certification **NOISE-6**, and the revision to the title of Condition of Certification **NOISE-10** to appropriately define the purpose of this condition of certification.

The added text is identified as **bold and underlined**, and the deleted text is identified as ~~strikethrough~~.

NOISE-1 Property Owner Notification: 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 Compliance Project Manager (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 Documentation of Noise Complaints: 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 an operable 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, and/or measure noise levels at the complainant's property line, 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 CPM's telephone number.
- 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 Noise Control Program: 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 Use of Low-Pressure Steam Blows: 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. Project owner shall strive to avoid nighttime steam blows. If nighttime low pressure steam blows are unavoidable, these low pressure steam blows shall not exceed nighttime ambient hourly L_{50} value determined in **NOISE-6** plus 2 decibels at the nearest residential property line during the hours 6:00 p.m. to 7:30 a.m. 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 Steam Blow Notification: 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 Compliance with Noise Standards: 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. Steam relief valves shall be adequately muffled.

A. Determine the ambient noise level (L_{50}) at residential receivers. Prior to site mobilization, 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 30-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. This pre-construction survey shall be conducted during the period of June 1 to September 30. 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 30-day measurement data, in the judgment 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 and prior to site mobilization, 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, 7, ~~and~~ 8, **9, 10, 11, and 12** 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 in the Decision (as described in the AFC, Section 5.12, Figure 5.12-3, as amended May 4, 2001). “In addition, the Applicant shall conduct a 30-day community noise survey at the same receptor locations used for the 30-day noise measurement cited in Section A above.”

The post-construction 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 median 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. The project owner shall present the proposed mitigation measures to the Cities of El Segundo and Manhattan Beach and to the CPM.

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, the State of California’s Model Community Noise Control Ordinance defines a pure tone. The project owner shall present

the proposed mitigation measures to the Cities of El Segundo and Manhattan Beach and to the CPM.

E. Implement plant noise mitigation if required. If the results of noise measurements at ST-1, 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. The project owner shall present the proposed mitigation measures to the Cities of El Segundo and Manhattan Beach and to the CPM.

Verification: The pre-construction noise survey plan was completed in 2003, in accordance with the following requirements:

Pre-construction survey and determination of ambient noise level:

a) At least 60 days prior to site mobilization, 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.

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.

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 Occupational Noise Survey: 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 Construction/Demolition Schedule: Heavy equipment operation and noisy construction or demolition work shall be restricted beginning at site mobilization as described below.

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.

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 lower for continuous noise. For intermittent noise (up to 30 minutes in one hour) the maximum noise levels shall be ambient L_{50} plus 10 dBA). 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.

The use of the tank farm area is divided into ~~four~~ **five** 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, shown below:~~

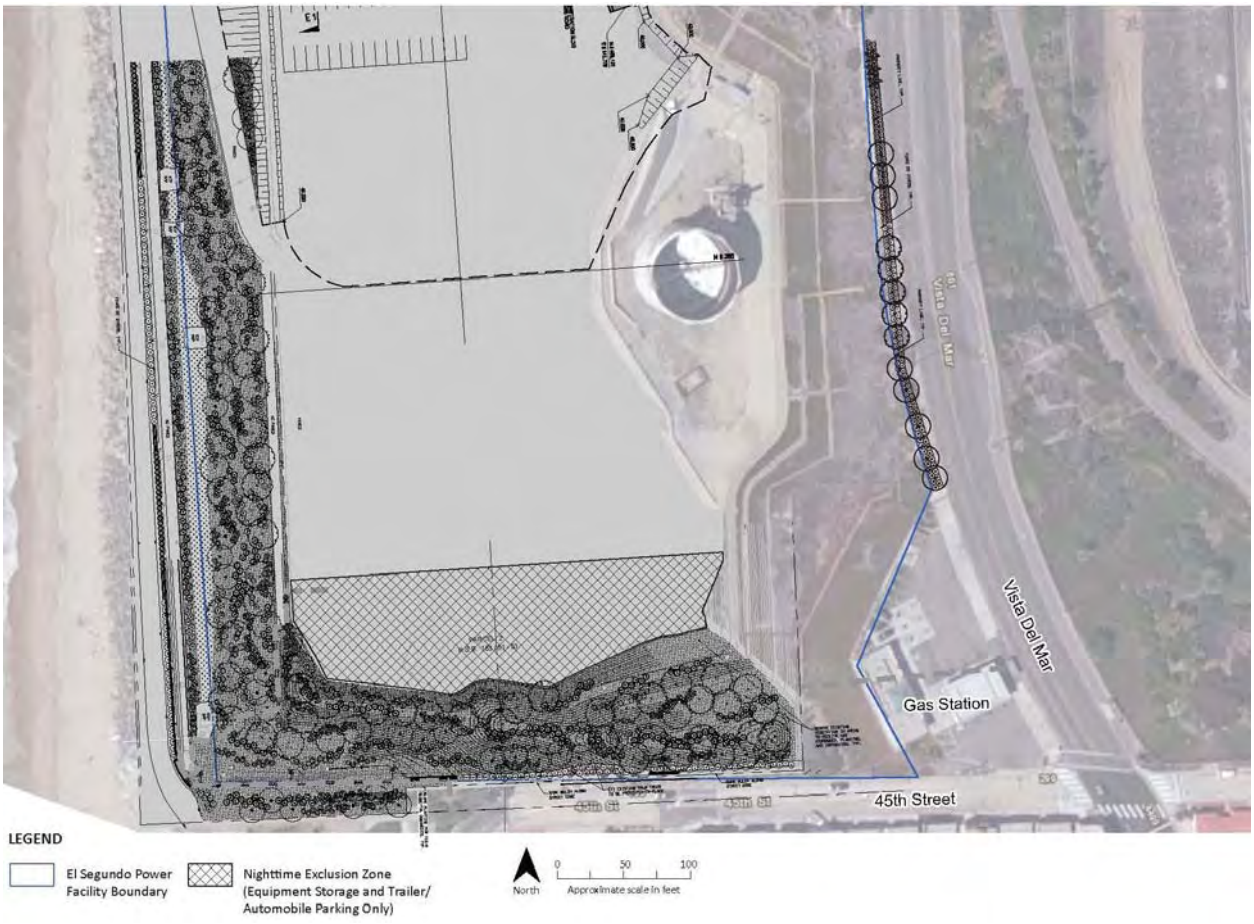
Phase I: Prepare the tank farm for use during demolition and construction: cutting openings into the sides of the tanks, use of grader, backhoe and small trucks, a few truck trips to remove material, some welding, installation of landscaping and irrigation. All demolition and construction will occur 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. During the hours 5:00PM to 9:00AM, 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.

Phase V: Demolition and removal of Units 3 and 4, and construction of Units 9, 10, 11 and 12: Construction activities in the area of the former tank farm will be restricted to 7:30 AM to 6:00 PM. All activities in southerly end of the former tank farm area (shaded area shown in the following figure) shall be further limited as follows: During daytime only, heavy trucks may be used in the area for maintenance related activities. During the hours 5:00 PM to 9:00 AM, the shaded area may be accessed by passenger vehicles or pedestrians only. Outside of the shaded area, contractor and staff passenger vehicles and trucks may access the former tank farm area at any time.



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**.

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 Operational Noise Vibration Monitoring: The project design and implementation shall ensure that site mobilization, 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 CPM's telephone number.

In the event of construction-related vibration complaints 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 days of construction.

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 Emergency Loudspeaker Restrictions ~~Testing~~: The loudspeaker system shall be used only for testing and 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 and operation of the project.

EXHIBIT 1 - NOISE COMPLAINT RESOLUTION FORM

El Segundo Energy Center
(00-AFC-14C)

NOISE COMPLAINT LOG NUMBER _____

Complainant's name and address:

Phone number: _____

Date complaint received: _____
Time complaint received: _____

Nature of noise complaint:

Definition of problem after investigation by plant personnel:

Date complainant first contacted: _____

Initial noise levels at 3 feet from noise source _____ dBA Date: _____

Initial noise levels at complainant's property: _____ dBA Date: _____

Final noise levels at 3 feet from noise source: _____ dBA Date: _____
Final noise levels at complainant's property: _____ dBA Date: _____

Description of corrective measures taken:

Complainant's signature: _____ Date: _____

Approximate installed cost of corrective measures: $ _____
Date installation completed: _____
Date first letter sent to complainant: _____(copy attached)
Date final letter sent to complainant: _____ (copy attached)

This information is certified to be correct:

Plant Manager's Signature: _____

(Attach additional pages and supporting documentation, as required).

REFERENCES

CEC 2005a – CEC (CEC-800-2005-001-CMF). El Segundo Power Redevelopment Project Commission Decision, dated February 2005.

ESPR 2000a – Application for Certification, submitted to the California Energy Commission on December 18, 2000.

Murphy 2014 – Michelle Murphy (TN 202321). Michelle Murphy Comments: Letter to Provide Comment on the Amendment. Submitted to CEC Case Docket on May 5, 2014.

NRG 2013a—NRG/El Segundo Energy Center, L.L.C. (tn 70442). Petition to Amend, dated April, 2013, submitted to the California Energy Commission on April 23, 2013.

NOISE APPENDIX A
FUNDAMENTAL CONCEPTS OF COMMUNITY NOISE

To describe noise environments and to assess impacts on noise sensitive areas, a frequency weighting measure, which simulates human perception, is customarily used. It has been found that A-weighting of sound intensities best reflects the human ear's reduced sensitivity to low frequencies and correlates well with human perceptions of the annoying aspects of noise. The A-weighted decibel scale (dBA) is cited in most noise criteria. Decibels are logarithmic units that conveniently compare the wide range of sound intensities to which the human ear is sensitive. **NOISE Table A1** provides a description of technical terms related to noise.

Noise environments and consequences of human activities are usually well represented by an equivalent A-weighted sound level over a given time period (L_{eq}), or by average day and night A-weighted sound levels with a nighttime weighting of 10 dBA (L_{dn}). Noise levels are generally considered low when ambient levels are below 45 dBA, moderate in the 45 to 60 dBA range, and high above 60 dBA. Outdoor day-night sound levels vary over 50 dBA depending on the specific type of land use. Typical L_{dn} values might be 35 dBA for a wilderness area, 50 dBA for a small town or wooded residential area, 65 to 75 dBA for a major metropolis downtown (e.g., San Francisco), and 80 to 85 dBA near a freeway or airport. Although people often accept the higher levels associated with very noisy urban residential and residential-commercial zones, they nevertheless are considered to be levels of noise adverse to public health.

Various environments can be characterized by noise levels that are generally considered acceptable or unacceptable. Lower levels are expected in rural or suburban areas than what would be expected for commercial or industrial zones. Nighttime ambient levels in urban environments are about seven decibels lower than the corresponding average daytime levels. The day-to-night difference in rural areas away from roads and other human activity can be considerably less. Areas with full-time human occupation that are subject to nighttime noise, which does not decrease relative to daytime levels, are often considered objectionable. Noise levels above 45 dBA at night can result in the onset of sleep interference effects. At 70 dBA, sleep interference effects become considerable (Effects of Noise on People, U.S. Environmental Protection Agency, December 31, 1971).

In order to help the reader understand the concept of noise in decibels (dBA), **NOISE Table A2** has been provided to illustrate common noises and their associated sound levels, in dBA.

NOISE Table A1
Definition of Some Technical Terms Related to Noise

Terms	Definitions
Decibel, dB	A unit describing the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure, which is 20 micropascals (20 micronewtons per square meter).
Frequency, Hz	The number of complete pressure fluctuations per second above and below atmospheric pressure.
A-Weighted Sound Level, dBA	The sound pressure level in decibels as measured on a Sound Level Meter using the A-weighting filter network. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise. All sound levels in this testimony are A-weighted.
L_{10}, L_{50}, & L_{90}	The A-weighted noise levels that are exceeded 10 percent, 50 percent, and 90 percent 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 (often used for an existing or pre-project noise condition for comparison study).
Intrusive Noise	That noise that intrudes over and above the existing ambient noise at a given location. The relative intrusiveness of a sound depends upon its amplitude, duration, frequency, and time of occurrence and tonal or informational content as well as the prevailing ambient noise level.
Pure Tone	A pure tone is defined by the Model Community Noise Control Ordinance as existing if the one-third octave band sound pressure level in the band with the tone exceeds the arithmetic average of the two contiguous bands by 5 decibels (dB) for center frequencies of 500 Hz and above, or by 8 dB for center frequencies between 160 Hz and 400 Hz, or by 15 dB for center frequencies less than or equal to 125 Hz.
Source: Guidelines for the Preparation and Content of Noise Elements of the General Plan, Model Community Noise Control Ordinance, California Department of Health Services 1976, 1977.	

NOISE Table A2
Typical Environmental and Industry Sound Levels

Noise Source (at distance)	A-Weighted Sound Level in Decibels (dBA)	Noise Environment	Subjective Impression
Civil Defense Siren (100')	140-130		Pain Threshold
Jet Takeoff (200')	120		Very Loud
Very Loud Music	110	Rock Music Concert	Very Loud
Pile Driver (50')	100		Loud - Very Loud
Ambulance Siren (100')	90	Boiler Room	Loud - Very Loud
Freight Cars (50')	85		Loud
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	Moderately Loud - Quiet
Light Traffic (100')	50	Private Business Office	Moderately Loud - Quiet
Large Transformer (200')	40		Quiet
Soft Whisper (5')	30	Quiet Bedroom	Quiet
	20	Recording Studio	Very Quiet
	10		Threshold of Hearing

Source: Handbook of Noise Measurement, Arnold P.G. Peterson, 1980

Subjective Response to Noise

The adverse effects of noise on people can be classified into three general categories:

- Subjective effects of annoyance, nuisance, dissatisfaction.
- Interference with activities such as speech, sleep, and learning.
- Physiological effects such as anxiety or hearing loss.

The sound levels associated with environmental noise, in almost every case, produce effects only in the first two categories. Workers in industrial plants can experience noise effects in the last category. There is no completely satisfactory way to measure the subjective effects of noise, or of the corresponding reactions of annoyance and dissatisfaction, primarily because of the wide variation in individual tolerance of noise.

One way to determine a person's subjective reaction to a new noise is to compare the level of the existing (background) noise, to which one has become accustomed, with the level of the new noise. In general, the more the level or the tonal variations of a new

noise exceed the previously existing ambient noise level or tonal quality, the less acceptable the new noise will be, as judged by the exposed individual.
With regard to increases in A-weighted noise levels, knowledge of the following relationships can be helpful in understanding the significance of human exposure to noise.

1. Except under special conditions, a change in sound level of one dB cannot be perceived.

2. Outside of the laboratory, a three dB change is considered a barely noticeable difference.

3. A change in level of at least five dB is required before any noticeable change in community response would be expected.

4. A ten dB change is subjectively heard as an approximate doubling in loudness and almost always causes an adverse community response. (Kryter, Karl D., The Effects of Noise on Man, 1970).

Combination of Sound Levels

People perceive both the level and frequency of sound in a non-linear way. A doubling of sound energy (for instance, from two identical automobiles passing simultaneously) creates a three dB increase (i.e., the resultant sound level is the sound level from a single passing automobile plus three dB). The rules for decibel addition used in community noise prediction are:

NOISE Table A3
Addition of Decibel Values

When two decibel values differ by:	Add the following amount to the larger value
0 to 1 dB	3 dB
2 to 3 dB	2 dB
4 to 9 dB	1 dB
10 dB or more	0
Figures in this table are accurate to ± 1 dB.	

Source: Architectural Acoustics, M. David Egan, 1988

Sound and Distance

Doubling the distance from a noise source reduces the sound pressure level by six dB.

Increasing the distance from a noise source 10 times reduces the sound pressure level by 20 dB.

Worker Protection

OSHA noise regulations are designed to protect workers against the effects of noise exposure, and list permissible noise level exposure as a function of the amount of time to which the worker is exposed:

NOISE Table A4
OSHA Worker Noise Exposure Standards

Duration of Noise (Hrs/day)	A-Weighted Noise Level (dBA)
8.0	90
6.0	92
4.0	95
3.0	97
2.0	100
1.5	102
1.0	105
0.5	110
0.25	115

Source: 29 C.F.R. § 1910

PUBLIC HEALTH

Testimony of Obed Odoemelam, Ph.D.

SUMMARY OF CONCLUSIONS

The project owner, El Segundo Energy Center LLC (ESEC, LLC) proposes to modify the existing El Segundo Energy Center (ESEC) by replacing its utility boiler Units 3 and 4 with one combined-cycle generator (Unit 9), one new steam turbine generator (Unit 10), and two new simple-cycle gas turbines (Units 11 and 12). This would add 449 gross megawatts (MW) to the existing 573 MW-generating capacity for a total of 1,022 gross MW. The amended project to be known as El Segundo Power Facility Modification (ESPFM), would also replace the existing once-through seawater cooling system with dry-cooling technology. Staff has established that the toxic emission increment from the additional 449 MW would not lead to significant cancer and non-cancer impacts in the project area. Since the related cancer and non-cancer risk estimates are below staff's significance levels and reflect the efficiency of the project owners' proposed emission controls, staff does not recommend additional mitigation measures.

INTRODUCTION

As discussed in the Project Description section of the Petition to Amend (Pages 2-1 through 2-39), the proposed plant modification is a project in which the existing El Segundo Energy Center (ESEC) would have its utility Boiler Units 3 and 4 replaced with one combined-cycle generator (Unit 9), one new steam turbine generator (Unit 10), and two new simple-cycle gas turbines (Units 11 and 12). This would add 449 gross megawatts (MW) to the generating capacity of the existing 573 MW facility for a total of 1,022 gross MW. The resulting project would be cooled with dry-cooling technology instead of the present once-through seawater cooling. The background levels of the pollutants of main concern in this analysis include those from the existing ESEC and the other area sources as analyzed during the ESEC licensing process. The ESPFM-related impacts would derive from facility operations, the background levels, and emissions from the proposed demolition and removal of Units 3 and 4.

The purpose of this public health analysis is to assess ESPFM-related construction and operation emissions to establish whether or not the associated increase in power generation would lead to pollutant increases 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 Final Staff Assessment (FSA) while the health and safety significance of exposure to the project-related electric and magnetic fields (EMF) is addressed in the **Transmission Line Safety and Nuisance** section.

Since this project modification is proposed for a site with past and on-going industrial activities, the project owner 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 performed during the ESEC licensing process to

determine whether specific remediation would be necessary before construction or project-related demolition. The requirements for preventing such impacts were presented in the Waste Management section of that document.

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 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 (to be published at a later date in the FSA Part B), by comparing operational-phase ambient concentrations with the applicable ambient 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 ESPFM is proposed for an area with existing violations of specific air quality standards as noted during the ESEC licensing process and discussed in the **Air Quality** section (to be published at a later date in the FSA Part B), such mitigation has been recommended in that section.

LAWS ORDINANCES, REGULATIONS AND STANDARDS (LORS)

There are no changes from the original analysis presented for the existing ESEC.

SETTING

The proposed project is located within the existing 33-acre ESEC site whose setting was presented during the application for certification for this project. There are no changes to this original analysis with regard to climate, topography, population distribution and methods for assessing the potential cancer and non-cancer impacts of the toxic pollutants of concern. However, the setting is described more fully in the **Air Quality** section (to be published at a later date in the FSA Part B), to adequately reflect the necessity for staff's recommended conditions of certification.

IMPACTS

For the assessed toxic project pollutants, 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 poses a theoretical risk of cancer. 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 presented during the licensing of this facility. Since cancer is currently considered possible from every carcinogenic exposure, 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.

Compliance with any Air Quality Management 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 California Air Resources Board. This accounts for the prominence of theoretical cancer risk estimates in the environmental risk assessment process.

PROJECT SPECIFIC IMPACTS

The health impacts of primary concern in this analysis can be assessed separately as construction-phase impacts and operational-phase impacts.

Construction Phase Impacts

Construction-phase impacts are impacts from site contamination and emissions from construction activities. The project owner's site contamination assessment for the licensed ESEC (as discussed in the Public Health section of Staff's FSA for ESEC) identified soil contamination from past industrial activities within and outside the site. The ESEC assessment also established the site's underground water to be contaminated from off-site sources, the most important of which is the nearby Chevron Refinery. As also discussed in the ESEC FSA, 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 of this staff FSA with respect to the demolition and construction phases for ESPFM. 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 tailpipe emissions from the vehicles and equipment to be used. The project owner has identified these construction-phase vehicles and equipment along with expected emission rates for the relatively short (20-month) construction period of specific concern (ESEC 2013 p 3-112 and Appendix 3.1D). The project owner also modeled and presented the concentrations of the criteria pollutants and diesel emissions of potential health significance in this regard (ESEC 2013, pages 3-23, 3-24, 3-112, and Appendix 3.1D). Staff is in agreement with the project owner's impact assessment approach as more fully presented in the **Air Quality** section (to be published at a later date in the FSA Part B) along with the project owner's mitigation plan and staff's recommended conditions of certification. These staff-recommended mitigation measures are specified in the **Air Quality** section (to be published at a later date in the FSA Part B)**.**

Direct Operational Impacts

As noted in a report by the South Coast Air Quality Management District (SCAQMD) (SCAQMD 2000, page 6), one characteristic that distinguishes the air toxics of primary concern in this analysis from some criteria pollutants (some of which are subject to further reactions with oxidative pollutants in the course of dispersion in the atmosphere), is that their impacts tend to be highest in close proximity to their sources and quickly drop off with distance from such sources. This was noted in during the licensing process for this facility and means that the proposed project's toxic air emission levels would be highest immediately around it and decrease rapidly as one moves into the surrounding area.

The project owner's estimates of ESPFM's potential 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 (ESEC 2013, pages 3-113 through 3-115, and Appendix 3.1C). The results from this assessment were provided to staff along with documentation of the assumptions used (ESEC 2013, pages 3-113 and Appendix 3.1C). 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.

The project owner's analysis did not include the age-specific exposure refinement approach currently recommended by the California Office of Health Hazard Assessment (OEHHA) for toxic exposures. Staff's incorporation of OEHHA's age-specific factors has established that there is no significant difference between exposure levels as obtained using the original assessment approach and the current OEHHA-recommended approach at the emission levels, and, for the exposure pathways being considered. Staff, therefore, concurs with the project owner's findings with the original exposure assessment approach with regard to the numerical public health risk estimates expressed in terms of the hazard index for each non-carcinogenic pollutant, or cancer risks for estimated levels of the carcinogenic pollutants. These analyses are conducted in all cases to estimate 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 toxic air pollutants that were considered with regard to a possible cancer risk are: acetaldehyde, benzene, 1, 3 butadiene, chrysene, formaldehyde, PAHs and propylene oxide.

STAFF'S SIGNIFICANCE CRITERIA

Various state and federal agencies such as the California Environmental Protection Agency (EPA), the Federal EPA, and the Federal Food and Drug Administration (FDA), specify different cancer risk levels as levels of health significance with regard to specific sources. For example, a risk of 10 in a million is primarily considered under the Air Toxics "Hot Spots" program developed in response to Assembly Bill 2588, 1987 (Health and Safety Code Sections 44360 et seq.) 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 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 District's criterion is 1 in a million.

For the proposed and similar projects, the Energy Commission staff considers a potential cancer risk of 1 in a million as the *de minimis* level, which is the level below which the related exposure is considered negligible (meaning that project operation would be unlikely to result in any material increase in cancer cases). 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 the current state of knowledge to limit the rate of addition to the already high (1 in 3, or 330,000 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 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. This fraction, according to the SCAQMD (SCAQMD 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 ESPFM 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.

The project owner's estimates for the proposed ESPFM was presented by the project owner on Table 3.8-2 (ESEC 2013, Pages 3-115) and verified by staff for accuracy. For the proposed ESPFM, a maximum incremental cancer risk of 0.17 in 1 million was calculated for the maximally exposed individual. This number is below staff's significance criterion of 1 in a million, suggesting a lack of a material cancer risk to any individual within the project's impact area. The maximum chronic hazard index of 0.0029 was calculated for the maximally exposed individual and is well below staff's significance criterion of 1.0, meaning that the project's emissions would be unlikely to significantly add to the area's health status related to chronic non-cancer effects. A

maximum acute hazard index of 0.005 was calculated for the same individual. This is significantly below staff's criterion of 1.0, suggesting a lack of significant modification-related impacts of an acute nature. Such immediate-onset impacts are considered for the individual with specific sensitivity to environment pollutants or the individual whose sensitivity may occur during physical exertions that could increase his or her breathing rate and related level of exposure. Existing exposure limits are established by the regulatory agencies in ways that ensure protection against all sensitivity-related effects.

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 to 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 project, even with the expected increase in annual usage, staff does not expect its operations to contribute significantly to any area toxic exposure of a cumulative nature.

To assess the total contribution from all on-site units (Units 5 through 12) during ESPFM operation, the project owner calculated the total cancer risk increment as 0.25 in a million, which is below staff's significance level. The related acute index value is 0.01 while the chronic index is 0.0057. Both index values are well below staff's significance levels suggesting that total facility emissions would not contribute significantly to total area cancer and non-cancer health risk. Since these risk estimates reflect the effectiveness of the proposed and existing emission controls, staff does not recommend further mitigation measures.

ENVIRONMENTAL JUSTICE

Staff established from the 2010 census data that the minority population within the project's six-mile impact area is 63.3 percent, pointing to a relatively high percentage of minorities in this impact zone. 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 at levels above potential health significance.

RESPONSE TO AGENCY AND PUBLIC COMMENTS

No comments specific to public health were received from agencies or the general public. However, at the April 22, 2014, Preliminary Staff Assessment workshop for the project, an area resident, inquired about the potential for facility-related emissions to

adversely affect exercising individuals who might be more susceptible to the effects of air pollution than non-exercising persons. Staff addressed this concern at the workshop by noting that the exposure limits for assessing the potential health risks from the proposed ESPFM and similar projects are established in ways that ensure protection against even the most sensitive individuals in each impact area. This would ensure protection for both the exercising individual with specific exertion-related sensitivity to environmental pollutants and the non-exercising individual with normal sensitivity.

CONCLUSIONS AND RECOMMENDATIONS

Staff has determined that the construction and operation of the proposed ESPFM 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 as most effective for this and similar facilities.

Since the operation of the proposed ESPFM 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 (to be published at a later date in the FSA Part B) for 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.

ESPFM (El Segundo Energy Center 2013). Petition to Amend. Submitted to the California Energy Commission on April 13, 2013.

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.

SOCIOECONOMICS

Testimony of James Adams and Lisa Worrall

SUMMARY OF CONCLUSIONS

Energy Commission staff (Staff) concludes that construction and operation of the El Segundo Power Facility Modification (ESPFM) would not cause significant direct, indirect, or cumulative socioeconomic impacts on the project area's population, housing, schools, law enforcement, or parks and recreation. Staff also concludes that the project would not induce a substantial population growth or displacement of population, or induce substantial increases in demand for housing, parks, or law enforcement services.

Staff concludes the minority population in the six-mile project buffer constitutes an environmental justice population as defined by *Environmental Justice: Guidance Under the National Environmental Policy Act*, and would trigger further scrutiny for purposes of an environment justice analysis. Because the project would have no significant adverse socioeconomic impacts, the project would have no socioeconomic impact on the environmental justice population as identified in **Socioeconomics Figure 1**.

Staff is proposing changes to Condition of Certification **SOCIO-1** and a new Condition of Certification, **SOCIO-3**, that would ensure project compliance with state and local laws, ordinances, regulations, and standards (LORS). **Bold underline** is used to indicate new language in the "Proposed Conditions of Certification" subsection and ~~strikethrough~~ is used to indicate deleted language.

INTRODUCTION

Staff's socioeconomics impact analysis evaluates the project's induced changes on existing population, employment patterns, and community services. Staff discusses the estimated impacts of the construction and operation of the ESPFM on local communities, community resources, and law enforcement services, and provides a discussion of the estimated beneficial economic impacts of the construction and operation of the proposed project.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS (LORS)

The applicable socioeconomic LORS have changed since staff's analysis was conducted in the original 2002 El Segundo Power Redevelopment proceeding and the 2007 Dry Cooling Amendment. The new LORS are the California Education Code related to schools (school district fees) and subsections of the El Segundo Municipal Code regarding utility users tax (electricity, gas, and water), and development impact fees (police, fire, libraries, and parks). **Socioeconomics Table 1** contains the new LORS (shown in **bold**) and other applicable LORS to the proposed project.

Socioeconomics Table 1
Laws, Ordinances, Regulations, and Standards (LORS)

Applicable Law	Description
State	
California Education Code, Section 17620	**The governing board of any school district is authorized to levy a fee, charge, dedication, or other requirement for the purpose of funding the construction or reconstruction of school facilities.**
California Government Code, Sections 65996-65997	Except for a fee, charge, dedication, or other requirement authorized under Section 17620 of the Education Code, state and local public agencies may not impose fees, charges, or other financial requirements to offset the cost for school facilities.
Local	
El Segundo Municipal Code	
Title 3 Revenue and Finance, Chapter 7 Utility Users Tax	
Subsection 3-7-3: Electricity Users Tax	**Tax imposed upon every commercial or industrial utility user in the city using electrical energy in the city.**
Subsection 3-7-5: Gas Users Tax	**Tax imposed upon every commercial or industrial utility user in the city other than a gas corporation, using gas delivered through mains or pipes.**
Subsection 3-7-6: Water Users Tax	**Tax imposed upon every commercial or industrial utility user in the city using water delivered though mains or pipes.**
Title 15 Zoning Regulations, Chapter 27A Development Impact Fees	**Imposes fees on applicants seeking to construct development projects for impacts on the city's public services and public facilities (police, fire, library, parks & recreation/open spaces, general facilities, community centers, and road project construction).**

SETTING

The proposed ESPFM is located in the city of El Segundo, Los Angeles County, within the boundaries of the existing El Segundo Energy Center (ESEC) industrial site. The existing power plant is located at 301 Vista Del Mar Boulevard at the southern-most city limit of El Segundo between Dockweiler Beach and the city of Manhattan Beach. The ESEC 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 (NRG 2013a). The existing power plant has five generating units (Units 5-8). The project owner's 2013 Petition to Amend (PTA) the ESEC proposes to demolish Units 3 and 4, and construct Units 9 through 12 and a new administration/maintenance/operations support building, among other things (NRG 2013a).

For the purposes of assessing project impacts, staff defines the "local workforce" during project construction as workers residing within a two-hour commute of the project. This includes Los Angeles-Long Beach-Glendale Metropolitan Division (Los Angeles

County), Santa Ana-Anaheim-Irvine Metropolitan Statistical Area (MSA) (Orange County), and Riverside-San Bernardino-Ontario MSA (Riverside and San Bernardino counties).The “local workforce” during project operation is defined as workers residing within a one-hour commute of the project.

Staff defines the study area related to project impacts on population and housing as the city of El Segundo and nearby cities to the project site. The study area for environmental justice impacts is within a six-mile buffer of the project site. The city of El Segundo is the study area for police services and parks. The study area for impacts to schools is the El Segundo Unified School District. The study area for indirect and induced economic impacts is defined as Los Angeles County and the study area for cumulative impacts is nearby cities to the ESEC and Los Angeles County.

USING THE 2010 US CENSUS AND US CENSUS BUREAU'S AMERICAN COMMUNITY SURVEY IN STAFF ASSESSMENTS

After the 2000 census, the detailed social, economic, and housing information previously collected on the decennial census long-form became the American Community Survey (ACS) [US Census 2013]. The U.S. Census Bureau's ACS is a nationwide, continuous survey that will continue to collect long-form-type information throughout the decade. Decennial census data is a 100 percent count collected once every ten years and represents information from a single reference point (April 1st). The main function of the decennial census is to provide counts of people for the purpose of congressional apportionment and legislative redistricting. ACS estimates are collected from a sample of the population based on information compiled continually and aggregated into one, three, and five-year estimates (“period estimates”) released every year. The primary purpose of the ACS is to measure the changing social and economic characteristics of the U.S. population. As a result, the ACS does not provide official counts of the population in between censuses. Instead, the Census Bureau's Population Estimates Program will continue to be the official source for annual population totals, by age, race, Hispanic origin, and sex.

ACS collects data at every geography level from the largest level (nation) to the smallest level available (block group (BG)).[33] Census Bureau staff recommends the use of data no smaller than the Census tract level.[34,] Data from the five-year estimates is

[33] Census Block Group - A statistical subdivision of a census tract. A BG consists of all tabulation blocks whose numbers begin with the same digit in a census tract; for example, for Census 2000, BG 3 within a census tract includes all blocks numbered between 3000 and 3999. The block group is the lowest-level geographic entity for which the Census Bureau tabulates sample data from the decennial census.

[34] Census Tract - A small, relatively permanent statistical subdivision of a county or statistically equivalent entity, delineated for data presentation purposes by a local group of census data users or the geographic staff of a regional census center in accordance with Census Bureau guidelines. Census tracts are designed to be relatively homogeneous units with respect to population characteristics, economic status, and living conditions at the time they are established. Census tracts generally contain between 1,000 and 8,000 people, with an optimum

used for our analysis as it provides the greatest detail at the smallest geographic level. Because ACS estimates come from a sample population, a certain level of variability is associated with these estimates. This variability is expressed as a margin of error (MOE). The MOE is used to calculate the coefficient of variation (CV). CVs are a standardized indicator of the reliability of an estimate. While not a set rule, the US Census Bureau considers the use of estimates with a CV more than 15 percent a cause for caution when interpreting patterns in the data (US Census 2009). In situations where CVs for estimates are high, the reliability of an estimate improves by using estimates for a larger geographic area (e.g. city or community versus census tract) or combining estimates across geographic areas.

PROJECT-SPECIFIC DEMOGRAPHIC SCREENING

Staff's demographic screening is based on information contained in two documents: *Environmental Justice: Guidance Under the National Environmental Policy* Act (Council on Environmental Quality [CEQ] 1997) and *Final Guidance for Incorporating Environmental Justice Concerns in EPA's Compliance Analyses* (US Environmental Protection Agency [EPA] 1998). The intention is to identify potentially sensitive populations, which could be disproportionately impacted by the proposed action. Due to the changes in the data collection methods used by the U.S. Census Bureau, the screening process relies on 2010 U.S. Census data to determine the number of minority populations and data from the 2008-2012 ACS to evaluate the presence of individuals and households living below the federal poverty level.

Staff's demographic screening is designed to identify the presence of minority or below-poverty-level populations, or both, within a six-mile buffer of the proposed project site. The six-mile buffer is based on air quality modeling, which shows that project-related impacts from pollutants decrease to less than significant within six miles of the emission site. Staff uses the six-mile buffer to determine the area of potential project impacts and to obtain data to gain a better understanding of the demographic makeup of the communities potentially impacted by the project. When Socioeconomics staff identifies the presence of an environmental justice population, staff from the thirteen affected technical areas evaluates the project for potential disproportionate impacts on the environmental justice population.[35] When staff's screening analysis does not identify an environmental justice population in the six-mile buffer, no further scrutiny is required for purposes of an environmental justice analysis.

MINORITY POPULATIONS

According to *Environmental Justice: Guidance Under the National Environmental Policy Act*, minority individuals are defined as members of the following groups: American

size of 4,000 people. Census tract boundaries are delineated with the intention of being stable over many decades, so they generally follow relatively permanent visible features.

[35] The thirteen technical staff/areas are Air Quality, Hazardous Materials Management, Land Use, Noise and Vibration, Public Health, Socioeconomics, Soil and Water Resources, Water Supply, Traffic and Transportation, Transmission Line Safety and Nuisance, Visual Resources, Cultural Resources, and Waste Management.

Indian or Alaskan Native; Asian or Pacific Islander; Black, not of Hispanic origin; or Hispanic. An environmental justice population is identified when the minority population of the potentially affected area is greater than fifty percent or is meaningfully greater than the minority population in the general population or other appropriate unit of geographical analysis.

Socioeconomics Figure 1 shows the total population within the six-mile buffer of the project site was 564,776 persons with a minority population of 358,228 persons, or 63.4 percent of the total population (US Census 2010a). The population in the six-mile buffer lives primarily within the cities of El Segundo, Manhattan Beach Redondo Beach, Hermosa Beach, Lawndale, Hawthorne, and Inglewood, and to a much lesser extent, in the cities of Torrance, Gardenia, and Los Angeles. **Socioeconomics Figure 2** shows the jurisdictions of the cities in and around the six-mile buffer. The minority population in the six-mile buffer is comparable to the minority populations in the combined Census County Divisions (CCD's) that encompass the project buffer (South Bay Cities and Inglewood), nearby cities, and Los Angeles County (**Socioeconomics Table 2**).

Socioeconomics Table 2
Minority Populations within the Project Area

Area	Total Population	Not Hispanic or Latino: White alone	Minority	Percent Minority
Six-Mile Buffer of Project Site (**Socioeconomics Figure 1**)	564,776	206,548	358,228	**63.4**
Gardena	58,829	14,498	44,331	**75.36**
Torrance	84,293	27,678	56,615	**67.16**
Los Angeles	3,792,621	1,086,908	2,705,713	**71.34**
Comparison Geographies				
Project Area CCDs*- Total	507,737	127,590	380,147	**74.87**
--South Bay Cities	138,043	98,699	39,344	28.50
--Inglewood	369,694	28,891	340,803	**92.19**
Los Angeles County	9,818,605	2,728,321	7,090,284	**72.21**

Note: Bold - minority population 50 percent or greater. *CCD – Census County Division.
Source: US Census 2010a.

Staff concludes that the minority population in the six-mile project buffer is greater than fifty percent and constitutes an environmental justice population as defined by *Environmental Justice: Guidance Under the National Environmental Policy* Act, and would trigger further scrutiny for purposes of an environmental justice analysis.

BELOW-POVERTY-LEVEL-POPULATIONS

The official poverty thresholds do not vary by geography (e.g. state, county, etc.), but are updated annually to allow for changes in the cost of living. The population for whom poverty status is determined does not include institutionalized people, people in military quarters, people in college dormitories, and unrelated individuals under 15 years old.

Staff identified the below-poverty-level population in the project area using CCD data from the 2008-2012 ACS Five-Year Estimates from the U.S. Census (US Census

2012).[36] The CEQA and US EPA guidance documents identify a fifty percent threshold to determine whether minority populations are considered environmental justice populations but do not provide a discrete threshold for below-poverty-level populations. To better understand the presence of poverty in the area, staff compares the below-poverty-level populations in the six-mile buffer to other appropriate geographies. As shown in **Socioeconomics Table 3,** staff used data for the cities in and around the six-mile buffer and Los Angeles County as geographies to compare levels of poverty in populations near the project.

Socioeconomics Table 3
Poverty Data within the Project Area

Area	Total			Income in the past 12 months below poverty level			Percent below poverty level		
	Estimate*	MOE	CV	Estimate	MOE	CV	Estimate	MOE	CV
Census County Divisions Used to Determine Poverty Status- Total	503,702	±2,203	0.26	79,776	±3,559	2.7	15.8	0.71	2.73
--South Bay Cities	137,943	±156	0.07	6,336	±819	7.85	4.6	±0.6	7.93
--Inglewood	365,759	±2,197	0.36	73,440	±3,505	2.9	20.1	±0.9	2.72
Comparison Geographies									
Culver City	38,660	±165	0.26	2,759	±497	10.9	7.1	±1.3	11.1
Gardena	58,262	±205	0.21	8,305	±1,349	9.87	14.3	±2.3	9.77
Los Angeles	3,735,119	±1,949	0.03	790,901	±9,302	0.71	21.2	±0.20	0.57
Torrance	144,206	±467	0.20	10,626	±1,173	6.71	7.4	±0.8	6.57
Los Angeles County	9,684,503	±2,610	0.02	1,658,231	±14,195	0.52	17.1	±0.1	0.35

Note: * Population for whom poverty status is determined. **Source:** US Census 2012.

As displayed above in **Socioeconomics Table 3**, 15.8 percent or 79,776 of the population within the six-mile buffer live below the federal poverty level. When reviewing the poverty data for the comparison geographies in **Socioeconomics Table 3**, the Inglewood CCD and the city of Los Angeles stand out with 20 to 21 percent of the population living below the poverty level. In comparison, the poverty levels in the remaining geographies are in the mid-teens or less. Therefore, the 15.8 percent below-poverty-level population within the six-mile buffer of the project site is comparable to the below-poverty-level population in the comparison geographies.

METHOD AND THRESHOLD FOR DETERMINING SIGNIFICANCE

The California Environmental Quality Act (CEQA) requires a list of criteria to determine the significance of identified impacts. A significant impact is defined by CEQA as “a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project” (State CEQA Guidelines Section 15382). Thresholds serve as the benchmark for determining if a project will result in a significant adverse impact when evaluated against existing conditions (e.g., "baseline" conditions). State CEQA Guideline Section 15064(e) specifies that: "economic and social changes

[36] Staff determined that the data at the CCD level is the lowest level available that retains reasonable accuracy. The data represents a period estimate, meaning the numbers represent an area’s characteristics for the specified time period.

resulting from the project shall not be treated as significant effects on the environment. Section 15064(e) states that where "a physical change is caused by economic or social effects of a project, the physical change may be regarded as a significant effect in the same manner as any other physical change resulting from the project. Alternatively, economic and social effects of a physical change may be used to determine that the physical change is a significant effect on the environment. If the physical change causes adverse economic or social effects on people, those adverse effects may be used as a factor in determining whether the physical change is significant."

Staff has used Appendix G of the State CEQA Guidelines for this analysis, which specifies that a project could have a significant effect on population, housing, and law enforcement services, schools and parks if it would:

- Induce substantial population growth in an area, either directly or indirectly;
- Displace substantial numbers of people and/or existing housing, necessitating the construction of replacement housing elsewhere; or
- Adversely impact acceptable levels of service for police protection, schools, and parks and recreation.

Staff's assessment of impacts on population, housing, police protection, schools, and parks and recreation are based on professional judgments, input from local and state agencies, and the industry-accepted two-hour commute range for construction workers and one-hour commute range for operational workers.

DIRECT/INDIRECT IMPACTS AND MITIGATION

INDUCE SUBSTANTIAL POPULATION GROWTH

For the purpose of this analysis, staff defines "induce substantial population growth" as workers moving into the project area because of project construction and operation, thereby encouraging construction of new homes or extension of roads or other infrastructure. To determine whether the project would induce population growth, staff analyzes the availability of the local workforce and the population within the region. Staff defines "local workforce" for project construction as those workers residing within a two-hour commute of the project site. This area includes the Los Angeles-Long Beach-Glendale Metropolitan Division (Los Angeles County), Santa Ana-Anaheim-Irvine (MSA[37]) (Orange County), and Riverside-San Bernardino-Ontario MSA (Riverside and San Bernardino Counties). Workers residing in these MSAs with greater than a two-hour commute would be considered non-local and would likely seek lodging during construction closer to the project site. Staff defines "local workforce" for project operation as workers residing within a one-hour commute of the project.

[37] An MSA contains a core urban area population of 50,000 or more, consists of one or more counties, and includes the counties containing the core urban area, as well as any adjacent counties that have a high degree of social and economic integration (as measured by commuting to work) with the urban core.

Socioeconomics Table 4 shows the historical and projected populations for the cities within the six-mile buffer plus Los Angeles County for reference. The cities of Hawthorne, Lawndale and the city and county of Los Angeles have the highest projected population growth in the ESEC general area. The city of El Segundo is projected to grow about two percent between 2010 and 2035, compared with a much larger growth of 15.6 percent for Los Angeles County.

Socioeconomics Table 4

Historical and Projected Populations

Area	2000[1]	2010[2]	2020[3]	2035[3]	2040[4]	2050[4]	Projected Population Change 2010-2035	
							Number	Percent
Cities within the Project Study Area Total*	360,115	364,778	377,800	392,900	-	-	28,122	7.71
-- El Segundo	16,033	16,654	16,900	17,000	-	-	346	2.07
-- Inglewood	112,580	109,673	111,900	113,500			3,827	3.48
-- Hawthorne	84,112	84,293	89,600	96,300	-	-	12,007	14.24
-- Hermosa Beach	18,566	19,506	19,600	19,700	-	-	194	0.99
-- Lawndale	31,711	32,769	34,600	37,400	-	-	4,631	14.13
-- Manhattan Beach	33,852	35,135	35,500	36,000	-	-	865	2.46
-- Redondo Beach	63,261	66,748	69,700	73,000			6,252	9.37
-- Los Angeles	3,694,820	3,792,621	3,991,700	4,320,600	-	-	527,797	13.92
Los Angeles County	9,519,338	9,818,605	10,404,000[3] 10,441,441[4]	11,353,000[3] 11,120,284[4]	11,243,022	11,434,565	1,534,395**	15.63

Note: *The city of Los Angeles is not included in project study area total as the majority of the city is outside of the project study area (a small portion is inside the project study area). **Calculated using the highest 2035 population projection. – Data not available. **Sources:** [1]US Census 2000, [2]US Census 2010a, [3]SCAG 2012, [4]CA DOF 2013.

Socioeconomics Table 5 shows the total labor by skill for the Los Angeles-Long Beach-Glendale Metropolitan Division, Santa Ana-Anaheim-Irvine, and Riverside-San Bernardino-Ontario MSA's would be more than adequate to provide construction labor for the ESPFM. **Socioeconomics Table 6** shows the project labor needs compared with the total labor supply in the study area as identified in **Socioeconomics Table 5**.

The project owner identified the primary trades required for the project demolition/construction as boilermakers, carpenters, electricians, ironworkers, laborers, millwrights, operators, and pipefitters (LL 2013n). If approved, the ESEC owner would remove existing Units 3 and 4 to make way for the Units 9 through 12. Demolition activities are estimated to take six months and would begin in late 2015. Construction of the proposed ESPMF is anticipated to commence by mid-2016 and conclude in 2018, to meet a projected on-line date of summer 2018 (NRG 2013a). The project owner would employ an average of 330 workers and the workforce would peak during months 17 through 23 with 500 workers (LL 2013n).

In addition to the ESPFM workforce identified in **Socioeconomics Table 6**, the project owner will require 22 to 42 contractor staff per month during the 24-month demolition/construction phase. This would involve construction managers, administrators, engineering supervisors, health and safety engineers, operating engineers, and construction material inspectors (LL 2013n). The project owner assumed that because of the size of the local construction workforce the majority of construction workers would come from Los Angeles County (NRG 2013a). Based on previous power plant siting cases, staff believes the majority (90 percent) of construction workers would commute daily to the project site and a small workforce, about ten percent, would come from outside the local two-hour commute area. Given the peak construction workforce of 500 workers, approximately 50 would come from outside the local area.

Energy Commission staff contacted the local building and construction trades council (Los Angeles/Orange Counties Building and Construction Trades Council [LAOCBCTC]) for more information about the local construction workforce in Los Angeles County. LAOCBCTC staff Ron Miller explained that information from their local unions shows there are more than sufficient union members available within a commuting distance of the ESEC. In addition, LAOCBCTC staff indicated the recession has caused huge unemployment in their trades with 15 to 40 percent unemployment in their local unions (LAOCBCTC 2013).

Fifty workers are now employed at the ESEC and this number would not change when the new project becomes operational (NRG 2013b). Staff concludes the project's construction and operation workforces would not directly or indirectly induce a substantial population growth in the project area, and therefore, the project would have a less than significant impact on the existing workforce.

Socioeconomics Table 5

Total Labor by Skill in the Study Area: Los Angeles-Long Beach-Glendale Metropolitan Division, Santa Ana-Anaheim-Irvine MSA, and Riverside-San Bernardino-Ontario MSA

Craft	Los Angeles-Long Beach-Glendale Metropolitan Division (Los Angeles County)				Santa Ana-Anaheim-Irvine MSA (Orange County)				Riverside-San Bernardino-Ontario MSA (Riverside & San Bernardino Counties)			
	Total Workforce (2010)	Total Projected Workforce (2020)	Growth from 2010		Total Workforce (2010)	Total Projected Workforce (2020)	Growth from 2010		Total Workforce (2010)	Total Projected Workforce (2020)	Growth from 2010	
			Number	Percent			Number	Percent			Number	Percent
Carpenter	15,530	17,960	2,430	15.6	12,410	12,320	-90	-0.7	10,140	10,450	310	3.1
Laborer	23,160	27,810	4,650	20.1	11,900	12,700	790	6.6	11,870	13,380	1,510	12.7
Teamster	16,510[1]	20,280	3,770	22.8	3,540[1]	3,880	340	9.6	7,810[1]	9,660	1,850	23.7
Electrician	10,310	11,360	1,050	10.2	4,880	5,150	270	5.5	4,000	4,520	520	13.0
Ironworker	1,130	1,270	140	12.4	380	390	10	2.6	700	670	-30	-4.3
Millwright	300	270	-30	-10.0	12,800[2]	14,390	1,590	12.4	140	140	0	0.0
Boilermaker	240	280	40	16.7	59,590[3]	61,660	2,080	3.5	52,650[3]	57,040	4,390	8.3
Plumber	8,180[4]	9,230	1,050	12.8	3,770[4]	4,000	220	5.8	3,160[4]	3,570	410	13.0
Pipefitter	8,180[4]	9,230	1,050	12.8	3,770[4]	4,000	220	5.8	3,160[4]	3,570	410	13.0
Insulation Worker	93,060[3]	108,580	15,520	16.7	250[6]	270	20	8.0	52,650	57,040	4,390	8.3
Operating Engineer	3,310[5]	4,030	720	21.8	2,400[5]	2,690	290	12.1	2,510[5]	3,030	520	20.7
Oiler/ Mechanic	34,450[2]	39,640	5,190	15.1	12,800[2]	14,390	1,590	12.4	11,260[2]	13,030	1,770	15.7
Cement Finisher	2,420	3,020	600	24.8	1,760	1,930	170	9.7	2,420	2,570	150	6.2
Masons	2,420	3,020	600	24.8	1,760	1,930	170	9.7	2,420	2,570	150	6.2
Roofers	93,060[3]	108,580	15,520	0.0	59,590[3]	61,660	2,080	3.5	1,700[3]	1,310	-390	-22.9
Sheet Metal Worker	2,230	2,320	90	4.0	950	960	10	1.1	1,440	1,580	140	9.7
Sprinkler Fitters	8,180[4]	9,230	1,050	12.8	3,770[4]	4,000	220	5.8	3,160[4]	3,570	410	13.0
Painters	9,360	10,740	1,380	14.7	6,430	6,550	110	1.7	4,320	4,570	250	5.8
Sheetrockers	3,690[7]	4,680	990	26.8	3,810[7]	3,910	100	2.6	2,270[7]	2,510	240	10.6
Surveyors	590	660	70	11.9	650	750	100	15.4	940	520	80	18.2
Plasterers	1,370	1,540	170	12.4	850	830	-20	-2.4	770	750	-20	-2.6
Totals	337,680	393,730	56,050	16.5	207,700	218,360	10,660	5.1	174,490	196,050	21,560	12.3

Notes: [1] Industrial Truck and Tractor Operators; [2] Industrial Machinery Mechanics and [2] Maintenance and Repair W, General and [2] Maintenance Workers, Machinery; [3] Construction Trade Workers; [4] Plumbers, Pipefitters, and Steamfitters; [5] Operating engineers and other construction equipment; [6] Insulation Workers, mechanical; [7] Drywall and Ceiling Tile Installers. **Source:** EDD 2012a.

Socioeconomics Table 6

Total Labor by Skill in the Study Area MSAs/MD versus Project Labor Needs

Study Area MSAs						
Craft	**Total Workforce (2010)**	**Total Projected Workforce (2020)**	**Growth from 2010**		**ESEC Construction Workforce Needs- Peak Month**	
			Number	**Percent**	**Craft**	Peak Month 23 rd month after mobilization
Carpenter	38,080	40,730	2,650	7.0	Carpenter	66
Laborer	46,930	53,890	6,960	14.8	Laborer	58
Teamster	27,860	33,820	5,960	21.4	Teamster	2 (6)
Electrician	19,190	21,030	1,840	9.6	Electrician	74
Ironworker	2,210	2,330	120	5.4	Ironworker	23 (53)
Millwright	13,240	14,800	1,560	11.8	Millwright	8 (24)
Boilermaker	112,480	118,980	6,500	5.8	Boilermaker	15 (48)
Plumber	15,110	16,800	1,690	11.2	Plumber	0
Pipefitter	15,110	16,800	1,690	11.2	Pipefitter	120
Insulation Worker	145,960	165,890	19,930	13.7	Insulation Worker	36
Operating Engineer	8,220	9,750	1,530	18.6	Operating Engineer	18
Oiler/ Mechanic	58,510	67,060	8,550	14.6	Oiler/ Mechanic	0
Cement Finisher	6,600	7,520	920	13.9	Cement Finisher	0
Masons	6,600	7,520	920	13.9	Masons	8
Roofers	154,350	171,550	17,200	11.1	Roofers	0
Sheet Metal Worker	4,620	4,860	240	5.2	Sheet Metal Worker	14 (16)
Sprinkler Fitters	15,110	16,800	1,690	11.2	Sprinkler Fitters	9
Painters	20,110	21,860	1,750	8.7	Painters	5
Sheetrockers	9,770	11,100	1,330	13.6	Sheetrockers	0
Plasterers	2,990	2,373	-617	-20.6	Plasterers	5
Surveyors	2,180	1,930	-250	-11.5	Surveyors	3 (4)
I & C-Control Room	-	-	-	-	I & C-Control Room	0

Note: The number in parentheses in the last column is the maximum number of craft workers during the construction period. **Source:** Socioeconomics Table 5, LL 2013n	Total	Craft	464
		Contractor Staff	36 (42)
		Workforce	500

Housing Supply

Socioeconomics Table 7 presents housing supply data for the project area. As of April 1, 2010, there were 159,050 housing units within a six-mile buffer of the project site with a vacancy of 8,031 units, representing a 5.05 percent vacancy rate. Five percent vacancy is an industry-accepted minimum benchmark for a sufficient amount of housing available for occupancy (Virginia Tech 2006). The housing counts in the project area indicate a sufficient amount of available housing units within a six-mile buffer of the project site.

Socioeconomics Table 7
Housing Supply in the Project Area Update

Subject	Area			
	Cities in a Six Mile Buffer of Project Site*		Los Angeles County	
	Number	Percent	Number	Percent
OCCUPANCY STATUS				
Total housing units	159,050	100	3,445,076	100
--Occupied housing units	151,019	94.9	3,241,204	94.1
--Vacant housing units	8,031	5.05	203,872	5.9
VACANCY STATUS				
Vacant housing units	8,031	100.00	203,872	100
For rent	4,412	54.9	104,960	51.5
For sale only	720	8.9	26,808	13.1
For seasonal, recreational, or occasional use	1,068	13.2	19,099	9.4
Other**	1,831	22.8	53,005	26.0

Notes: *Cities include El Segundo, Hawthorne, Culver City, Hermosa Beach, Lawndale, Manhattan Beach, Redondo Beach, and Inglewood.** Other includes rented, not occupied; sold, not occupied; migratory workers, and other vacant.
Source: US Census 2010b

Los Angeles County has a large supply of lodging options with about 60 hotels and tens of thousands of rooms available in the Beach Cities/Los Angeles International Airport area alone (Discover Los Angeles 2013). In El Segundo, there are 10 hotels/motels with 2,023 rooms (ES 2013a). Given the large supply of lodging choices in El Segundo and Los Angeles County and the estimated number of non-local project construction workers (50 workers or 10 percent of the peak construction workforce), staff expects no new housing would be required as a result of the ESPFM.

The project would not require any additional employees during project operation. Staff concludes the project's construction and operation workforce would not have a significant impact on the housing supply in the project area.

Displace Substantial Numbers of Existing Housing and People

The ESPFM would be constructed on the site of the existing ESEC and would replace some of the existing power plant structures, thus the project would not directly displace existing housing or people. The project would not induce substantial population growth or create the need for replacement housing to be constructed elsewhere, as previously discussed. Staff concludes the project would have no impact on area housing as the

project would not displace any people or necessitate the construction of replacement housing elsewhere.

Result in Substantial Physical Impacts to Government Facilities

As discussed under the subject headings below, the ESPFM would not cause significant impacts to service ratios, response times, or other performance objectives relating to law enforcement, schools, or parks and recreation.

Law Enforcement

- The ESEC site is located within the jurisdiction of the city of El Segundo Police Department (ESPD). Staff contacted ESPD to discuss the proposed project, inquire about their ability to provide law enforcement services to the project, and solicit comments or concerns they might have about the project (CEC 2013b). Sergeant Rex Fowler responded by noting their single station serves as headquarters and is located at 348 Main Street; approximately one mile east of the ESEC site. ESPD's staff includes 14 officers (including detectives and motor officers), three sergeants, three lieutenants, and eight civilians. Current staffing is responsible for maintaining an even flow of traffic and safety for the public during specific construction events. Specialized equipment assets would be requested from surrounding agencies and Los Angeles County as needed for the project (ESPD 2013a).

Sergeant Fowler also noted the project would have a minimal impact on law enforcement services for onsite crime and would not affect the current response time of under two minutes to the project site for priority calls, and under five minutes for non-priority calls (ESPD 2013a, ESPD 2013b). Project-related construction traffic would affect the morning and afternoon commute, which must be considered when determining partial/complete road closures (ESPD 2013a). See the **Traffic and Transportation** section of this document for additional information.

In response to Sergeant Fowler's recommendation for extra security staffing at the ESEC site, staff provided him with an example of two **Hazardous Materials Management** Conditions of Certification that address construction and operation site security plans (CEC 2014a). Energy Commission staff typically apply these conditions of certification to projects like the ESPFM. Staff wanted to determine if with the addition of these conditions, Sergeant Fowler's concerns about the need for extra security staffing would be satisfied, or would there be something else he would recommend for the project. He advised staff that these would be very good. A new **Hazardous Materials Management** Condition of Certification, **HAZ-5**, would require the project owner to prepare a new or revise an existing site-specific Security Plan that would apply to all phases of activity on the site. Further discussion regarding ESEC site security is included in the **Hazardous Materials Management** section of this document.

The California Highway Patrol (CHP) is the primary law enforcement agency for state highways and roads. The city of El Segundo is bordered by segments of Interstate 405 and I-105 freeways, and the Pacific Coast Highway (State Route 1) bisects the city. The CHP is the primary law enforcement agency for the freeways and both CHP and ESPD serve the segments of the two freeways and Pacific Coast Highway within the city of El

Segundo. CHP services include law enforcement, traffic control, accident investigation and the management of hazardous material spill incidents. The nearest CHP office is located in Torrance (CHP 2013). The **Hazardous Materials Management** section of this document discusses response times for hazardous material spill incidents.

Based on communication with local law enforcement that would serve the project area, staff concludes the project would not result in law enforcement response times being affected so that they exceed adopted response time goals. The project would not necessitate alterations to the police station or the construction of a new police station to maintain acceptable response times for law enforcement services; therefore, no associated physical impact would result. Staff concludes that for the above reasons, the project would have a less than significant impact on police services.

Education

- The ESEC site is located within the El Segundo Unified School District (ESUSD).

ESUSD provides kindergarten through twelfth grade education at two elementary schools and one middle school and also provides 9th through12th grade education at one high school and one continuation school, with a combined enrollment of 3,431 students for the 2013/2014[38] school year (CDE 2014). **Socioeconomics Table 8** also presents the enrollment data for the current and previous school years and the average pupil-to-teacher ratio and average classroom size data for the ESUSD during the 2012/2013 and 2011/2012 school years. Correlating data for Los Angeles County is provided for reference.

Socioeconomics Table 8
Current School District Data

	Year	Enrollment	Pupil-to-Teacher Ratio	Average Class Size
El Segundo Unified School District	2013/2014	3,431	-	-
	2012/2013	3,415	24.1	29.3
	2011/2012	3,294	24.9	29.7
Los Angeles County	2013/2014	1,552,704	-	-
	2012/2013	1,564,205	22.1	22.6
	2011/2012	1,578,215	22.2	23.0

Note: - Data not available. **Source:** CDE 2014.

Based on the available pupil-to-teacher ratio and the average class size for ESUSD compared with the corresponding data for Los Angeles County, the ESUSD appeared more crowded than Los Angeles County in both the 2012/2013 and 2011/2012 school years. Staff contacted ESUSD staff and was advised that the district has capacity for new students (ESUSD 2013b).

During construction, staff expects the majority of the labor force would be hired locally with approximately ten percent of the workforce coming from outside the local area. Based on a peak employment of 500 workers during months 17 through 23, approximately 50 new workers could temporarily relocate closer to the project site.

[38] Data has been updated to reflect the current education data released by the California Department of Education since the publication of the PSA.

Staff's research and communication with building and construction trades' councils has shown that construction workers do not move their families with them when working on a project. Therefore, staff does not expect a significant impact to schools from construction of the ESPFM.

ESPFM would employ 14 workers from the existing ESEC workforce (LL 2013t). As no additional operations employees would be hired, no workers are anticipated to relocate closer to the project site and therefore no children would permanently relocate within the ESUSD.

Parks and Recreation

El Segundo has 15 parks and 7 recreational facilities offering such amenities as playground equipment, tennis and basketball courts, roller hockey, racquetball, lawn bowling, and picnic facilities. Additional amenities include an exercise course, sports fields (e.g. softball), swimming pools, bike and walking trails, dog exercise parks, resting/viewing benches, and memorial trees stands. The closest parks to the project site are Candy Cane Park and Holly Valley Park, which are about 0.5 miles north of the ESEC. Recreational facilities include the George E. Gordon Clubhouse, Joslyn Center, Urho Saari Swim Center, El Segundo Teen Center, El Segundo Youth Skate Park, and Camp Eucalyptus (ES 2013b).

Staff's analysis shows there would not be a large number of workers moving into the project area during project construction and no workers would move into the project area during operation. Therefore, there would be little, if any increase in the usage of or demand for parks or recreational facilities. Staff concludes the project would not result in significant physical impacts associated with the provision of new or physically altered government facilities in order to maintain performance objectives with respect to parks. The project would not increase the use of city parks or recreational facilities to the extent that substantial physical deterioration of the facility would occur or be accelerated. The project would not necessitate the construction of new parks in the area, nor does the project propose any park facilities. Staff concludes the project would have a less than significant impact on El Segundo parks and recreational facilities.

CUMULATIVE IMPACTS AND MITIGATION

A project may result in significant adverse cumulative impacts when its effects are cumulatively considerable; that is, when the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, other current projects, and probable future projects [Public Resources Code Section 21083); California Code of Regulations, Title 14, Sections 15064(h); 15065 (c); 15130; and 15355]. Mitigation requires taking feasible measures to avoid or substantially reduce the impacts.

In a socioeconomic analysis, cumulative impacts could occur when more than one project in the same area has an overlapping construction schedule, thus creating a demand for workers that cannot be met locally, or when a project's demand for public services does not match a local jurisdiction's ability to provide such services. An influx

of non-local workers and their dependents can strain housing, schools, parks and recreation, and law enforcement services.

Because of the large and mobile labor supply in the Los Angeles area, staff conducted a CEQANet[39] database search for projects in Los Angeles County and nearby cities within the county that would likely employ a similar workforce to the ESPFM as part of the project's cumulative impact analysis for socioeconomics. Staff contacted planning staff with the cities of Los Angeles, El Segundo, Manhattan Beach, Redondo Beach, Hermosa Beach, and Torrance to develop a list of large residential, industrial, and commercial projects that could have construction schedules overlapping with the ESEC. The project owner anticipates that if the ESPFM is approved, the project's 24-month demolition/construction would begin in late 2015 and conclude in 2018.

The projects in **Socioeconomics Table 9** represent the projects considered for socioeconomic cumulative impacts.

[39] The CEQANet database lists CEQA documents that have been submitted to the State Clearinghouse for state agency review.

Socioeconomics Table 9
Cumulative Projects

Status	Project Name	Project Description	Location	Est./Actual Construction Start Date & Duration
Planned**/** Present	EA-781	7-Unit Residential Condominium, 14,313 sq. ft.	El Segundo	Unknown
Planned/Present	EA-890, El Segundo Unified School District	304 Senior housing/assisted living facility up to 175,000 sq. ft.	El Segundo	Unknown
Planned/Present	Cambria Suites, EA-844	152 room hotel – 71,000 sq. ft.	El Segundo	Unknown
Foreseeable	EA-986, Mattel	R&D and office, 14 stories, 300,000 sq. ft., 810-space parking structure-8-stories	El Segundo	unknown
Foreseeable	EA-997, Hotel	5-story, 190 room hotel, 107,090 sq. ft.	El Segundo	Unknown, 1 to 2 year construction period.
Planned/ Present	Elevator, Escalator, and Moving Walkway Modernization	Refurbish 212 outdated systems with new, modern units throughout the airport; new escalators, elevators, and walkways	Los Angeles	May 2009 to July 2016
	LAX Curbside Appeal Project	Phase 1: New Canopy, landscaping, light band, and new light poles in front of Tom Bradley International Terminal; Phase 2: Light band, light poles, and canopies in front of the terminal in the LAX Central Terminal Area		Phase 1: Summer 2012-Aug. 2013; Phase 2: Spring 2014-Summer 2016
Foreseeable	West Aircraft Maintenance Area	Replace existing facilities and consolidate maintenance operations; paved area for aircraft parking, maintenance hangars, 300-space employee parking lot, storage, equipment related facilities, and ground run-up enclosure.	Los Angeles	Construction over an 8 to 10 year period
Planned/ Present	Wiseburn High School	New high school, 180,000 to 240,000 sq. ft.	El Segundo	Mid-2015, 22 month construction period

Status	Project Name	Project Description	Location	Est./Actual Construction Start Date & Duration
Foreseeable	E&B Oil Development Project	Proposed onshore drilling and production site using directional drilling of 30 wells to access the oil and gas reserves in the tidelands (granted by the State of California to the City) and in an onshore area known as the uplands. Both of these areas are located within the Torrance Oil Field beneath the City. Relocate the city maintenance yard to another site and installation of offsite underground pipelines for the transport of the processed crude oil and gas from the project site to purchasers. 30 oil wells, four water injection wells, and supporting production equipment.	Hermosa Beach	unknown
Foreseeable	Redondo Beach Energy Project	Natural gas fired air-cooled 496-megawatt electrical generating facility. Project would require demolition of existing power plant and construction of project.	Redondo Beach Generating Station site, Redondo Beach	Demo/Construction est. first quarter 2016 to fourth quarter 2020- a 60-month demo/construction period.
Planned/ Present	Crenshaw/ LAX Transit Corridor Project	An 8.5-mile light-rail line between existing Metro Exposition Line at Crenshaw & Exposition Blvds. to Metro Green Line's Aviation/LAX Station. Includes eight stations, a maintenance facility, park-ride lots, traction power substations and acquisition of rail vehicles and maintenance equipment.	Crenshaw Corridor, Inglewood, Westchester, and LAX area	Heavy construction set to begin spring 2014. Completion is expected by 2019.
Foreseeable	ENV-2012-1501-MND	Demolition of 22 single and multi-family residential units and approx. 2,000 sq. ft. of commercial floor area. Construction of new 5-story mixed-use residential building with 122 residential units (11 units for very low-income households), and total of 93,885 sq. ft. floor area and 122 parking spaces. The building will include 3,500 sq. ft. commercial floor area and 7 additional parking spaces for commercial use.	Los Angeles	est. 1-1.5- year construction period
Foreseeable	Phillips 66 Los Angeles Refinery –Carson Plant Crude Oil Storage Capacity Project	Installation of one new 615,000-barrel crude oil storage tank with geodesic dome, increasing the annual permit throughput limit of two existing 320,000 crude oil storage tanks. Project includes two new feed/transfer and one 14,000 bbl water draw surge tank with associated pumps and pipelines. Also included is the installation of Tie-lines to the Pier “T” crude oil delivery pipeline from Berth 121 and construction of one new electrical power station.	Carson	Unknown construction start, 18-month construction period

Status	Project Name	Project Description	Location	Est./Actual Construction Start Date & Duration
Foreseeable	Jordan High School Major Renovation Project	Project includes demolition of approximately 10 permanent buildings and 32 portable buildings, renovation of approximately 213,000 sq. ft. of existing building space, and construction of approximately 240,000 sq. ft. of new building space, to replace the classrooms that were demolished. At full buildout, the project site would consist of approximately 453,000 sq. ft. of total building space. The number of classrooms would decrease from 131 to 129 with a total maximum student capacity of 3,870. Capacity would decrease with the proposed project and there would be no change to enrollment. All phases of the proposed project would be contained within the existing boundaries of the school site.	Long Beach	Implementation of campus master plan in approximately six phases starting in January 2014 ending in 2028 (dependent on funding).
Foreseeable	Palladium Residences	Continued operation as an entertainment and event venue, with repairs and interior restorations. Two additional buildings up to 28 stories and approximately 350 feet in height under one of two options: Option 1- Residential Option: up to 731 residential units in two buildings; Option 2- Residential/Hotel Option: up to 598 residential units and up to 250 hotel rooms and ancillary hotel uses including banquet, meeting and related retail space in the two buildings. Both Options include ground-floor retail and restaurant space; recreational and open space facilities, and up to 1,900 parking spaces	Los Angeles	construction start 2015 or later
Foreseeable	8150 Sunset Blvd Mixed-Use Project	Demolition of existing uses and development of a two- to 16-story mixed-use commercial/residential building, including approx. 111,310 sq. ft. commercial retail and restaurant within three lower levels (one subterranean) and one rooftop level, with 249 apartment units (28 affordable housing units) within twelve upper levels representing 222,560 gross sq. ft. residential space. Parking provided in a seven-level (three subterranean and semi-subterranean) parking structure. Total development would include up to 333,870 sq. ft. commercial and residential space.	Los Angeles	Construction begins in 2015 with completion and occupancy estimated in 2017.
Planned/ Present	ENV-2012-1111-MND / 11965-11979 1/4 W. Montana Avenue	Demolition of 32 dwelling units within two existing apartment buildings and the construction of a new 5-story, 56-ft. high, 49-unit residential condominium project (incl.13 affordable dwelling units). Request two density bonus incentives: an 11-ft. increase in building height to 56-ft. in lieu of 45-ft. and the increase in, 89,350 sq. ft. floor area and 98 parking spaces.	Los Angeles	12-14 months minimum construction period
Foreseeable	I-405 Improvement Project	Either add one general purpose (GP) lane, or two GP lanes, or one GP lane and a tolled express lane in each direction of I-405 to be managed with the existing HOV lanes as a tolled express facility between SR-73 and Interstate 605. Improvements primarily in the Orange County for approx. 16 miles between 0.2-mile south of Bristol Street and 1.4 miles north of I-605, as well as portions of SR-22, SR-73, and I-605.	Los Angeles and Orange counties.	2015 to 2019

Status	Project Name	Project Description	Location	Est./Actual Construction Start Date & Duration
Planned/ Present	Purple Line Extension	9-mile extension of the Metro Purple Line subway west from the current terminus at Wilshire/Western, plus seven new stations.	Miracle Mile, Beverly Hills, Century City and Westwood	Sect.1 construction est. 2014-2023; Sect. 2 construction est. 2019-2026; Sect. 3 construction est. 2027- 2035.

ESPFM would employ an average of 330 workers per month during the 24-month demolition/construction period. Construction workforce would peak during months 17 through 23 with 500 workers onsite. Approximately ten percent of the construction workforce is expected to be non-local and would likely relocate closer to the project site. Once operational, the ESPFM would permanently employ 14 workers drawn from the existing ESEC staff. No additional staff would be required. **Socioeconomics Table 10** presents the total labor force for the crafts specifically needed for the construction of ESPFM displayed earlier in **Socioeconomics Table 5**. As shown in **Socioeconomics Table 10**, the labor force within the Los Angeles-Long Beach-Glendale Metropolitan Division and the surrounding MSAs are more than sufficient to accommodate the labor needs for construction of the ESPFM including other future planned projects identified in **Socioeconomics Table 9** (Los Angeles County and nearby cities).

Socioeconomics Table 10
Total Labor for Selected MSAs/MD

Total Labor for Selected MSAs/	Total Workforce for 2010	Total Projected Workforce for 2020	Growth from 2010	Percent Growth from 2010
Los Angeles-Long Beach-Glendale Metropolitan Division	337,680	393,730	56,770	16.6
Riverside-San Bernardino-Ontario MSA	174,490	196,050	21,560	12.3
Santa Ana-Anaheim-Irvine MSA (Orange County)	207,700	218,360	10,660	5.1
TOTALS	719,870	808,140	88,990	12.4

Note: Total workforce includes only the crafts specifically needed for the ESPFM. See **Socioeconomics Table 5** which shows the total labor by skill in the study area (MSAs/MD). **Source:** EDD 2012

There is a large supply of lodging choices in EL Segundo and Los Angeles County and there is sufficient housing supply. In addition, projects identified in **Socioeconomics Table 9** such as residential condominiums/apartments and a senior housing/assistance living facility would increase the existing housing supply. Staff does not anticipate the project's limited and temporary increase in the project area population would create a significant reduction in the housing supply. There would be no increase in operational workers and no new children would be added to the ESUSD. Staff's proposed Condition of Certification **SOCIO-3** would ensure the applicable school fee is paid by the project owner (see the "LORS Compliance" subsection below for more information). The increased usage of city parks or recreational facilities as a result of the project would be minimal. The project would not result in law enforcement response times being affected so that they exceed adopted response time goals and would not increase the demand for law enforcement services. Staff's proposed changes to Condition of Certification **SOCIO-1** would ensure that development impact fees would be paid by the project owner (see the "LORS Compliance" subsection below for more information).

Staff concludes the proposed ESPFM would not result in any significant direct, indirect, or cumulative impacts on population, housing, schools, law enforcement, or parks and recreation. **Socioeconomics Table 10** shows there is a more than sufficient workforce available for the ESPFM project plus other future planned projects displayed in

Socioeconomics Table 9. Therefore, staff does not expect the construction or operation of the ESPFM to contribute to any significant cumulative socioeconomic impacts.

LORS COMPLIANCE

SCHOOL IMPACT FEES

The statutory school fees, as authorized under Section 17620 of the Education Code, are collected and distributed by the ESUSD. The rate for new commercial or industrial development is $0.47 per square foot of covered and enclosed, non-residential space (ESUSD 2013a). The applicable fees are calculated prior to the issuance of building permits during plan review. Based on the preliminary project design, the approximately 30,000 square foot administration/maintenance/operations support building would be considered chargeable covered and enclosed space. Based on this preliminary estimate, a $14,100 school impact fee would be assessed for the ESUSD. Staff is proposing Condition of Certification **SOCIO-3** to ensure the payment of this fee to the school district. ESPFM would comply with Section 17620 of the Education Code through the one-time payment of a statutory school impact fee to the ESUSD. Staff concludes the project would have a less than significant impact on schools.

UTILITY USERS TAX

Chapter 7- Utility Users Tax (Title 3) of the El Segundo City Code applies to the ESEC because the project uses electricity generated by the local grid and gas and water delivered through mains and pipes within the city of El Segundo. More specifically, Subsection 3-7-3 imposes a tax on any commercial or industrial user that uses electrical energy in the city. Staff understands that the ESEC uses electricity provided by the local grid during operations or for station load when the plant is not operating (see the **Transmission System Engineering** section of this document for more information). The electricity users tax is three percent of the Southern California Edison charges used to generate the electricity. The tax is collected every month and would continue to be levied when the ESPFM becomes operational.

Subsection 3-7-5 (Gas Users Tax) imposes a tax on any commercial or industrial user of gas in the city of El Segundo delivered through mains or pipes. The tax is based on daily gas consumption multiplied by the Southern California Gas Company (SoCal) daily gas price. A three percent tax is applied to the total monthly gas cost. The gas tax revenue for the ESEC has ranged from $335,000 to approximately $1,260,000 over the last several years (ES 2014a). Once the ESPFM becomes operational, the amount of tax revenue would be based on the volume of gas used during the month, the current tax rate, and the SoCal daily gas price. The project owner estimates that about one third of the $2 to $4 million annual gas and utility user tax would be levied for gas consumption (CEC 2014e).

Subsection 3-7-6 (Water Users Tax) is a tax imposed on every commercial or industrial utility user in the city of El Segundo using water delivered through mains or pipes. The tax imposed is at a rate of three percent of the charges made for city water and would

be paid by the project owner to the city each month. Staff contacted Mr. Steve Jones, Business Services Manager with the city of El Segundo and was informed that the water users tax is levied on potable water (ES 2014b). The **Soil and Water Resources** section of this document notes that the ESPFM would use approximately 0.72 acre feet of potable water per year (AFY) on average and a maximum potable water use of 0.84 AFY.

CITY OF EL SEGUNDO DEVELOPMENT IMPACT FEES

Adopted in December 2005, Title 15 (Zoning Regulations) Chapter 27A (Development Impact Fees) in the El Segundo Municipal Code enables the city of El Segundo to impose development impact fees on applicants seeking to construct development projects. These development impact fees apply to all fees imposed by the city to finance public facilities attributable to new development, including police, fire, library, parks and recreation/open space, general facilities, pubic use facilities (e.g. community centers), and road construction projects. The purpose of the development impact fees is to minimize, to the greatest extent practicable, the impact that new development has on the city's public services and public facilities (ESMC 2010).

Pursuant to this chapter, the City Council of El Segundo adopted in October 2010, Resolution No. 4687 for the purposes of calculating development impact fees to have developers pay for their fair share of public costs associated with new development while at the same time facilitating growth that is in the public interest. This resolution identifies a calculation of non-residential development fees on a per-square-foot basis. When existing non-residential development on a site is demolished and replaced with new non-residential development, impact fees are required for the net new non-residential building area added to the site (ESCC 2010).

As the ESPFM proposes demolition and construction of new non-residential building area, development impact fees are applicable to the project. The Schedule of Development Impact Fees Table identified in the resolution established development impact fees over a five-year period by land use. As noted earlier, project demolition would start in late 2015 and construction would start in mid 2016. The rate for the development impact fee effective on January 1, 2015 would apply. The Schedule of Development Impact Fees Table identifies fees for a five-year period, with the latest fee schedule effective from January 1, 2105. If an updated rate schedule were adopted and became effective by the time the ESPFM began construction, the updated rates would apply. The Schedule of Development Impact Fees, effective on January 1, 2015, identifies fees for police, fire, and parks for non-residential industrial new building area, only. No other fees are included in the fee schedule.

The impact fee for police would be $0.25 per square foot, the impact fee for fire would be $0.24 per square foot, and the impact fee for parks would be $0.23 per square foot (ESCC 2010). Given the administration building's 30,000 square foot chargeable covered and enclosed space (net new building area), the police impact fee would be $7,500, fire impact fee would be $7,200, and the parks impact fee would be $6,900. Staff has proposed changes to Condition of Certification **SOCIO-1** to ensure the ESPFM owner pays these one-time fees to the city of El Segundo.

With the implementation of staff's proposed conditions of certification, the construction and operation of the proposed ESPFM will comply with all applicable Socioeconomics LORS.

PROPERTY TAX

The California Board of Equalization (CBOE) has jurisdiction over the valuation of a power-generating facility for tax purposes, if the power plant produces 50 megawatts (MW) or greater. For a power-generating facility producing less than 50 MW, the county has jurisdiction over the valuation (CBOE 2003). The ESPFM would be a 435 MW power generating facility, therefore, CBOE is responsible for assessing property value. The property tax rate is set by the Los Angeles County Auditor-Controller's office. Property taxes are collected and distributed at the county level. **Socioeconomics Table 11** shows $5 million to $7 million in annual property taxes resulting from the ESPFM project operation.

Socioeconomics Table 11
ESPFM Economic Benefits (2013) dollars
From Operations and Maintenance (O&M)

Annual O&M payroll	$2 million to $3 million
Annual O&M employment	14 staff
Indirect Employment	1 additional person
Induced Employment	1 additional person
Indirect Income	$70,000 to $100,000 Annual
Induced Income	$100,000 to $150,000 Annual
Expenditures for locally purchased materials and supplies	$150,000 to $300,000 Annual
Total Annual Sales Tax	$15,000 to $22,000
Gas and Utility User Tax	$2 million to $4 million Annual
Total Annual Property Taxes	$5 million to $7 million
Note: This table presents an estimated range of socioeconomic benefits. **Source:** LL 2013t, Adapted from Attachment A, Table DR85-1	

NOTEWORTHY PUBLIC BENEFITS

For the purpose of this analysis, staff defines noteworthy public benefits to include changes in local economic activity and tax revenue that would result from project construction and operation. To assess the gross economic value of the proposed project, the project owner developed an input-output model using proprietary cost data similar to the IMPLAN Professional 3.0 software package. The assessment used Los Angeles County as the unit of analysis. Impact estimates reflect two different scenarios representing the demolition/construction phase and the operations phase of the project. For both phases, the project owner estimated the total direct, indirect, and induced economic effects on employment and labor income. Direct economic effects represent the employment, labor income, and spending associated with demolition, construction, and operation of the ESPFM. Indirect economic effects represent expenditures on intermediate goods made by suppliers who provide goods and services to the project. Induced economic effects represent changes in household spending that occur due to the wages, salaries, and proprietor's income generated through direct and indirect economic activity.

The resulting estimates do not represent a precise forecast, but rather an approximate estimate of the overall economic effect. Input-output models are static models, meaning they rely on inter-industry relationships and household consumption patterns, as they exist at the time of the analysis. This is important given that demolition of existing Units 3 and 4 would not begin until the end of 2015, construction of Units 9 through 12 would not begin until mid-2016, and completion of project construction activities would not occur until the middle of 2018. The model also assumes that prices remain fixed, regardless of changes in demand, and that industry purchaser-supplier relationships operate in fixed proportions. The model does not account for substitution effects, supply constraints, economies of scale, demographic change, or structural adjustments.

Socioeconomics Tables 11 and **12** display the project owner's range of estimates of the economic impacts/benefits due to project demolition, construction and operation. The total anticipated capital cost for construction is between $550 million to $650 million. This includes costs associated with demolition of existing Units 3 and 4, as well as construction of Units 9 through 12. During the 24-month demolition and construction period, the project would generate between $112 million to $174 million in labor income.

The project owner anticipates the ESPFM operations workforce (14) would be drawn from the existing ESEC workforce; therefore, no additional workers would be required. Annual Operation and Maintenance (O&M) payroll would be $2 million to $3 million a year with $150,000 to $300,000 thousand for expenditures for locally purchased materials and supplies annually. Approximately $170,000 to $250,000 in indirect and induced income would be generated annually as well as $15,000 to $22,000 in annual sales tax.

Socioeconomics Table 12
ESPFM Economic Benefits Associated with Demolition and Construction

Capital Cost (in millions)	$550 to $650
Total Demolition Payroll (6 months x 100 workers)	$12 million to $24 million
Total Construction Payroll (excluding demolition)	$100 million to $150 million
Average Annual Local Construction Payroll	$50 million to $75 million
Average Monthly Direct Demolition and Construction Employment	300-400; peak 500 construction workers/month
Indirect Employment	4 to 6 additional people
Induced Employment	8 to 10 additional people
Indirect Income	$400,000 to 700,000
Induced Income	$1.75 million to $2.25 million
Annual Local Expenditures on Materials and Supplies (excludes demolition)	$2.5 million to $4,5 million
Total Sales Tax	$15 million to $20 million
Note: This table presents an estimated range of socioeconomic benefits. **Source**: LL 2013t, Adapted from Table DR85-1	

RESPONSE TO AGENCY AND PUBLIC COMMENTS

Energy Commission staff sent a letter to the El Segundo Police Department (Chief Mitch Tavera) that discussed the proposed project, inquired about the department's ability to

provide law enforcement services to the project, and solicited comments or concerns the department might have about the project. Sergeant Rex Fowler responded with comments that staff addressed in this analysis. Energy Commission staff also contacted the Los Angeles/Orange Counties Building and Construction Trades Council (Ron Miller and Jim Adams) to discuss the proposed project, enquire about how much of project's workforce would seek lodging closer to the project, and solicit comments or concerns the construction and trades council might have about the project and the associated labor needs. Ron Miller's comments are included in this analysis.

Energy Commission staff did not receive any Socioeconomics-related comments on the PSA.

CONCLUSIONS

Staff concludes the ESPFM would not cause a significant adverse socioeconomic impact as a result of the construction or operation of the proposed project or contribute to any significant cumulative socioeconomic impacts, for the following reasons:

1. The project's construction and operation workforces would not directly or indirectly induce a substantial population growth in the project area.

2. The project's construction and operation workforce would not have a significant impact on housing within the project area and would not displace any people or housing, or necessitate construction of replacement housing elsewhere.

3. The project would not result in significant physical impacts associated with the provision of new or physically altered government facilities in order to maintain acceptable service ratios, response times, or other performance objectives with respect to law enforcement service, education, or parks and recreation.

4. As the project would have no significant adverse socioeconomic impacts, the project would have no socioeconomic impact on the environmental justice population within a 6-mile buffer of the project.

PROPOSED CONDITIONS OF CERTIFICATION

Staff is proposing modifications to Condition of Certification **SOCIO-1** and a new Condition of Certification, **SOCIO-3**. These conditions involve development impact and school fees. **Bold underline** is used to indicate new language. ~~Strikethrough~~ is used to indicate deleted language.

SOCIO-1 Prior to the start of commercial operations, the project owner shall pay the City of El Segundo the following one-time fees:

- Police service mitigation fee **based on** ~~of $0.11 per~~ **the** gross square foot of building area;

- Fire service mitigation fee **based on** ~~of $0.14~~ **the** per gross square foot of building area;
- **Parks service mitigation fee based on the gross square foot of building area.**
- Library service mitigation fee **based on** ~~of $0.03 per~~ **the** gross square foot of building area;
- Traffic mitigation fee for new development, in an amount to be determined by the City of El Segundo Public Works Director upon receipt of a Traffic Mitigation Fee Determination Form.

The gross square foot of building area ~~and the amount of the one-time fees~~ shall be determined by the City of El Segundo **based on the Schedule of Development Impact Fees Table** at the time the project owner submits the site plans.

Verification: Prior to the start of commercial operation, the project owner shall submit verification to the CPM that payment of any required public service mitigation fees have been submitted to the City of El Segundo. The project owner shall provide proof of payment of the Traffic Mitigation Fee in the next Monthly Compliance Report following payment.

NOTE: The Applicant and the City of El Segundo have reached a side agreement for the Applicant to perform the following analysis and request the Commission's inclusion of the agreement as a Condition of Certification.

SOCIO-2 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-3 The project owner shall pay the one-time statutory school facility development fee to the El Segundo Unified School District as required by Education Code Section 17620.

Verification: At least 30 days prior to the start of project construction, the project owner shall provide to the El Segundo CPM proof of payment of $14,100 to the El Segundo Unified School District of the statutory development fee.

REFERENCES

CBOE 2003 – California Board of Equalization, *Electric Generation Facilities – State/Local Assessment Jurisdiction Issues*, http://www.boe.ca.gov/proptaxes/pdf/lta03009.pdf.

CDE 2014 – California Department of Education, Educational Demographics Unit, Data Quest, http://dq.cde.ca.gov/dataquest/ accessed on April 30, 2014.

CDOF 2013 – California Department of Finance, *Report P-1 (County): State and County Total Population Projections, 2010-2060.* Sacramento, California, January 2013.

CEC 2005 – CEC (CEC-800-2005-001-CMF). El Segundo Power Redevelopment Project Commission Decision, dated 2/2005.

CEC 2010a – CEC (CEC-800-2010-015). El Segundo Power Redevelopment Project Amendment Commission Decision, dated 6/2010.

CEC 2013b – California Energy Commission, Letter to Chief of Police Mitch Tavera, El Segundo Police Department, from James Adams, California Energy Commission, (TN 71495). Submitted to CEC/Dockets Unit on 7/2, 2013.

CEC 2014a – CEC / J. Adams (TN 201583). Email regarding El Segundo Security Staffing dated 11/4/2013. Submitted to CEC on 1/21/2014.

CEC 2014e – CEC/L. Worrall (TN 202465). Email to CEC/Craig Hoffman and Jim Adams from George Piantka re: ESEC – Outstanding Information, dated January 10, 2014. Submitted to CEC/Docket Unit on June 17, 2014.

CEDD 2012 – Employment Development Department, State of California, *Labor Market Information, Projections of Employment by Industry and Occupation. 2010-2020 Occupational Employment Projections for Santa Ana-Anaheim-Irvine MSA (Orange County), Los Angeles-Long Beach-Glendale Metropolitan Division (Los Angeles County) ,and Riverside-San Bernardino-Ontario MSA (Riverside and San Bernardino Counties.* http://www.labormarketinfo.edd.ca.gov/LMID/Projections_of_Employment_by_Industry_and_Occupation.html.

CEQ 1997 – Council on Environmental Quality, *Environmental Justice: Guidance Under the National Environmental Policy Act*, December 10, 1997. http://www.epa.gov/compliance/ej/resources/policy/ej_guidance_nepa_ceq1297.pdf.

CHP 2013 – California Highway Patrol. http://www.chp.ca.gov/depts_divs_offs/601.html.

Discover Los Angeles 2013 – Discover Los Angeles, Beach Cities/LAX, Hotels. http://www.discoverlosangeles.com/experience-builder?type[]=18&region[]=25.

ES 2013a – City of El Segundo Website -Visiting El Segundo – Area Hotels. http://www.elsegundo.org/visiting/hotels/default.asp.

ES 2013b – City of El Segundo Website-Recreation and Parks-Parks and Facilities, http://www.elsegundo.org/depts/recreation/parks_n_facilities/default.asp.

ES 2014a – City of El Segundo / S. Jones (TN 201569). Email Clarification re Gas User City Tax dated 1/07/2014. Submitted to CEC on 1/17/2014.

ES 2014b – City of El Segundo / S. Jones (TN 201597). Gas User City Tax dated 1/14/2014. Submitted to CEC on 1/17/2014.

ESCC 2010 – El Segundo City Council, Resolution No. 4687, adopted on 10/5/2010. http://www.elsegundo.org/civicax/filebank/blobdload.aspx?blobid=8342

ESMC 2010 – El Segundo Municipal Code, Title 3, Chapter 7 (2010) and Title 15, Chapter 27A (2005). http://www.sterlingcodifiers.com/codebook/index.php?book_id=587

ESPD 2013a – El Segundo Police Department / D. Kim (TN 200149). El Segundo Police Department providing Law Enforcement Needs Assessment Form. Submitted to CEC on 8/12/2013.

ESPD 2013b – El Segundo Police Department / R. Fowler (TN 201335). Socioeconomics - Police Response Times. Submitted to CEC on 11/26/2013.

ESUSD 2013a – El Segundo Unified School District (TN 201003) El Segundo Unified School District Development Fees. Submitted to CEC on 10/23/2013.

ESUSD 2013b – El Segundo Unified School District (TN 201004) El Segundo Unified School District School Capacity. Submitted to CEC on 10/23/2013.

LAOCBCTC 2013 – Los Angeles / Orange Counties Building and Construction Trades Council / Ron Miller (TN 201380). *Reply to CEC's November 4, 2013 e-mail Regarding Construction and Operation Workforce, dated, November 26, 2013*. Submitted to CEC/ Dockets Unit on December 6, 2013.

LL 2013e – Locke Lord/J McKinsey (TN 200464). Project owner's Responses to Data Requests in Set One (#1-83). Submitted to CEC/Dockets Unit on 9/12/2013.

LL 2013f – Locke Lord/J. McKinsey (TN 200532). Project owner's Responses to Data Requests in Set Two (#84-90). Submitted to CEC/Dockets Unit on 9/19/2013.

LL 2013n – Locke Lord/J. McKinsey (TN 201186). Project owner's Responses to Data Requests in Set Four (#93). Submitted to CEC/Dockets Unit on 11/13/2013.

LL 2013t – Locke Lord/ J. McKinsey (TN 201424). Socioeconomic Data Response - Response to CEC Request for Supplemental Data Dated October 1, 2013). Submitted to CEC/Dockets Unit on December 12, 2013.

NRG 2013a – NRG/El Segundo Energy Center LLC (TN 70442), Petition to Amend, dated April 2013. Submitted To CEC Dockets Unit on 4/23/2013.

NRG 2013b – NRG/El Segundo Energy Center LLC (TN201000), ESEC Operational Employees. Submitted to CEC/Dockets Unit on 10/23/2013.

OK Dept. of Commerce 2010 – Oklahoma Department of Commerce ACS Calculator, last updated December 6, 2010. www.okcommerce.gov/Libraries/Documents/ACS-Calculator-1_3209.xls.

SCAG 2012 – Southern California Association of Governments, http://www.scag.ca.gov/forecast/index.htm, 2012.

US Census 2000 – United States Census Bureau P001: Total Population – Universe; Total Population – Census 2000 Summary File, http://factfinder2 -- 2000Pop_DEC_00_SF1_P001`.xls.

US Census 2009 – United States Census Bureau, *A Compass for Understanding and Using American Community Survey Data*, February 2009.

US Census 2010a – United States Census Bureau *P2: HISPANIC OR LATINO, AND NOT HISPANIC OR LATINO BY RACE - Universe: Total population, 2010* Census Redistricting Data (Public Law *94-171) Summary File,* http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml.

US Census 2010b – United States Census Bureau, QT-H1*: General Housing Characteristics: 2010* - 2010 Census Summary File 1, http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml.

US Census 2012 – United States Census Bureau, *S1701 POVERTY STATUS IN THE PAST 12 MONTHS 2008-2012 American Community Survey 5-Year Estimates*, http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml.

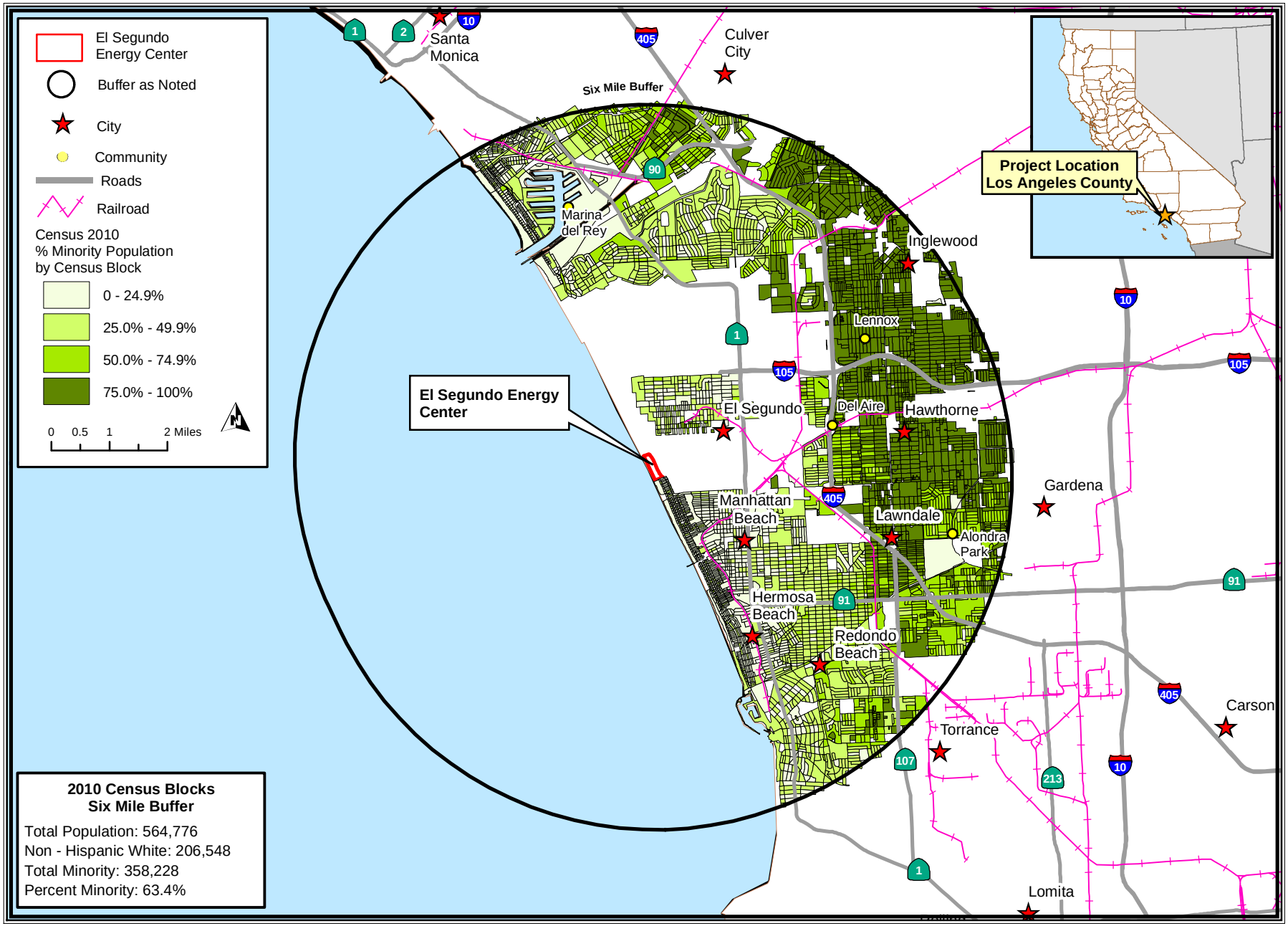
US Census 2013 – United States Census Bureau, *American Community Survey Information Guide,* Issued April 2013*,* http://www.census.gov/acs/www.Downloads/ACS_Information_Guide.pdf.

US EPA 1998 – United States Environmental Protection Agency, *Final Guidelines for Incorporating Environmental Justice Concerns in EPA's NEPA Compliance Analysis*, April1998. http://www.epa.gov/compliance/ej/resources/policy/ej_guidance_nepa_epa0498.pdf.

Virginia Tech 2006 – Virginia Tech, *Virginia Tech Housing Needs and Market Analysis*, *Thomas Jefferson PDC*, Center for Housing Research Virginia Tech, October 2006. http://www.vchr.vt.edu/pdfreports/tjhousingreportfinalrev3.pdf.

SOCIOECONOMICS - FIGURE 1

El Segundo Energy Center - Census 2010 Minority Population by Census Block - Six Mile Buffer



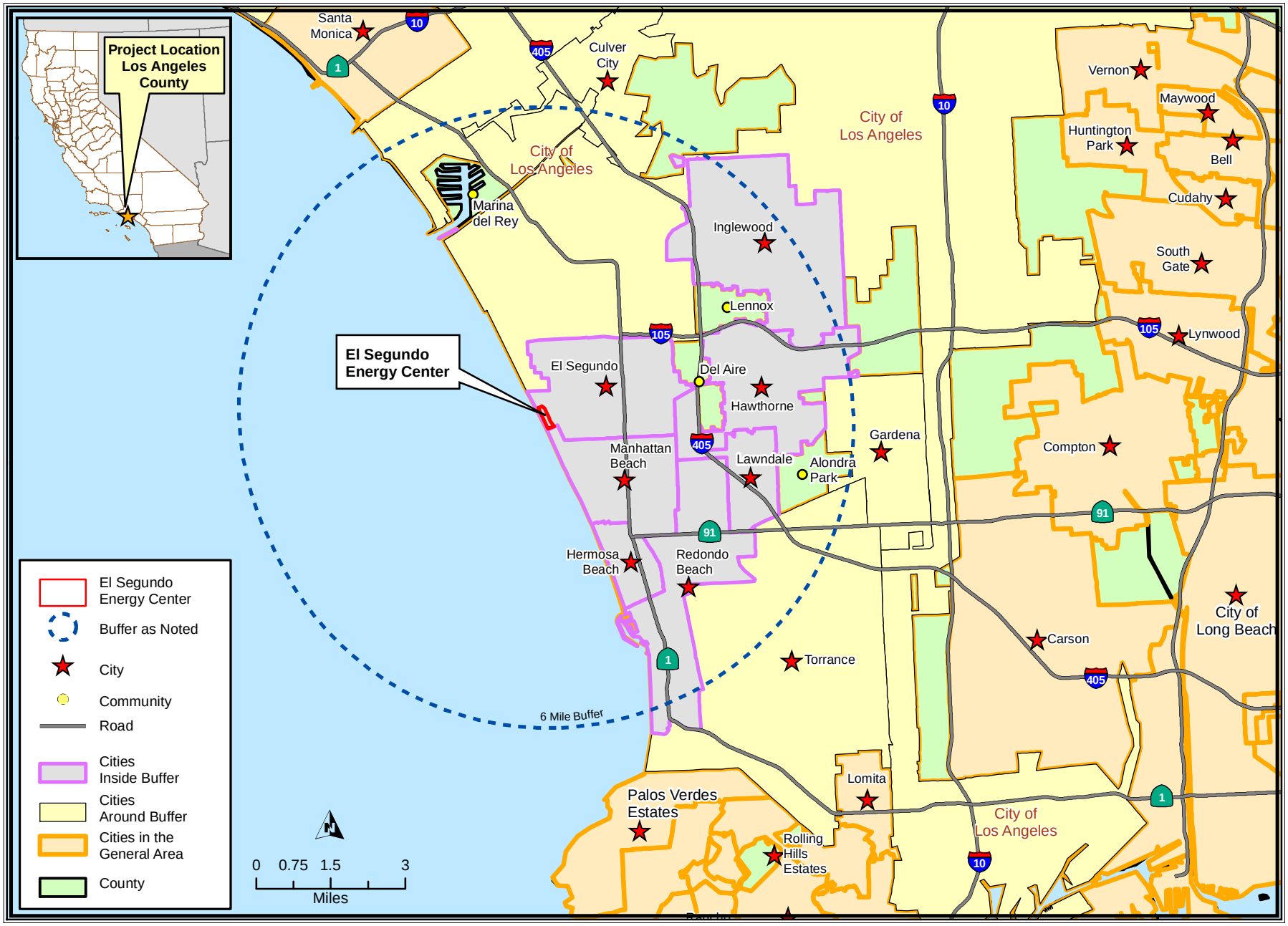
SOCIOECONOMICS

CALIFORNIA ENERGY COMMISSION, SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCE: Census 2010 PL 94-171 Data

SOCIOECONOMICS - FIGURE 2

El Segundo Energy Center - Cities In and Around the Six Mile Buffer



SOCIOECONOMICS

CALIFORNIA ENERGY COMMISSION, SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCE: Census 2010 PL 94-171 Data

SOIL AND WATER RESOURCES

Testimony of Mike Conway, P.G.

SUMMARY OF CONCLUSIONS

Based on the assessment of the proposed amendment to the El Segundo Energy Center (ESEC), referred to as the El Segundo Power Facility Modification (ESPFM), California Energy Commission (Energy Commission) staff concludes that:

- The proposed project would allow the ESEC to eliminate once-through-cooling (OTC) which would result in a 200 million gallon per day (mgd) reduction in intake and waste water volume to the Pacific Ocean. State Water Resources Control Board's (SWRCB) Resolution No. 2010-0020 and adoption of a Policy for the Use of Coastal and Estuarine Waters for Power Plant Cooling (OTC Plan), requires all coastal power plants that utilize OTC to meet new performance requirements (Best Technology Available [BTA]) through a reduction in intake volume and velocity. The proposed project helps achieve the goals of the OTC Plan through dry-cooling and reduced discharge.

- The proposed project would include use of air cooled condensers for cooling of the steam cycle. This technology significantly reduces the potential for use of water supplies and is encouraged in accordance with the Energy Commission's water policy. Also in accordance with the Energy Commission's water policy, the project would use a Zero-Liquid-Discharge system to reuse water and reduce wastewater volume.

- The proposed project would use recycled water exclusively for industrial operation.

- The proposed project's average potable water use during operation would be 96 acre feet per year (AFY) less than current site water use, which would result in additional supplies for other beneficial uses.

- The proposed site has a long industrial history and would not require much additional soil disturbance for the new facilities. The proposed project would therefore result in minimal losses to soil resources. Though some small losses in topsoil are expected during construction and operation from wind and water erosion, onsite management of stormwater runoff and sediment erosion as proposed by staff in Conditions of Certification **SOIL&WATER-1** and **SOIL&WATER-3,** would adequately minimize soil loss and pollutant discharge from industrial operation.

- Staff proposes Condition of Certification **SOIL&WATER-2**, which would require the proposed project to comply with the National Pollutant Discharge Elimination System (NPDES) Permit Order No. R4-2009-0068, General NPDES Permit No. CAG674001, if hydrostatic waters are discharged to waters of the United States. This condition would ensure that the impacts to waters of the United States from hydrostatic testing would be less than significant.

- Staff proposes Condition of Certification **SOIL&WATER-4**, which would require the project owner to pay the city of El Segundo all the normal fees associated with connections to their water and sewer systems.

- Groundwater at the site is relatively shallow and potentially contaminated by petroleum products or by-products. Trench and foundation excavations may encounter shallow groundwater and dewatering could be required for stabilization. If the project owner engages in dewatering, staff would require that the project owner comply with Condition of Certification **SOIL&WATER-5**, which would require the project owner to apply for coverage under a permit that would allow for the discharge of petroleum-contaminated water.

- Staff proposes Condition of Certification **SOIL&WATER-6**, which would limit the proposed project's maximum industrial water use to 137 AFY during operation, and potable water use to 23 AFY during construction. In addition, Condition of Certification **SOIL&WATER-6** would require use of tertiary treated recycled water for all construction purposes for which it is suited, including dust suppression, concrete mixing, hydrostatic testing, and compaction.

- Staff proposes Condition of Certification **SOIL&WATER-7**, which would require the project owner to install water meters.

- Staff proposes Conditions of Certification **SOIL&WATER-8** and **SOIL&WATER-9**, which would require the project owner to execute both recycled and potable water purchase agreements, respectively.

- The proposed project is located in Zone X and protected from the 1-percent annual chance of flooding (100-year flood).

- The elevation of the project site would ensure that the proposed project could be built and operated reliably under the reasonably expected sea level rise over the life of the project. High-end estimates of relative sea-level rise are 61 centimeters (2.0 feet) by 2050 (relative to 2000) (NAS, 2012), which would reduce the site's separation from the floodplain to three feet above the current (2012) 100-year floodplain (FEMA, 2008).

INTRODUCTION

The California Environmental Quality Act (CEQA) requires that the significant adverse environmental effects of a proposed project be identified and that such effects be eliminated or mitigated to the extent feasible (Pub. Resources Code, § 21002). CEQA defines a "significant effect" on the environment as a "substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project including … water." (Cal. Code Regs., tit. 14, § 15382).

This section of the Final Staff Assessment (FSA) analyzes the potential effects on soil and water resources by the proposed ESPFM. This assessment incorporates information gathered by the Energy Commission staff and focuses on the potential for the ESPFM to:

- cause accelerated wind or water erosion and sedimentation;
- exacerbate flood conditions in the vicinity of the project;
- adversely affect surface or groundwater supplies;
- degrade surface or groundwater quality; and,
- comply with all applicable laws, ordinances, regulations and standards (LORS) and state policies.

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.

LAWS, ORDINANCES, REGULATION, AND STANDARDS

The following federal, state, and local environmental LORS in **SOIL & WATER Table 1** listed for the ESPFM and similar facilities require the best and most appropriate use and management of groundwater resources. Additionally, the requirements of these LORS are specifically intended to protect human health and the environment. Actual project compliance with these LORS is a major component of staff's determination regarding the significance and acceptability of the ESPFM with respect to the use and management of soil and water resources.

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

Federal LORS	
Clean Water Act (33 U.S.C. Section 1257 et seq.)	The Clean Water Act (CWA) (33 USC § 1257 et seq.) requires states to set standards to protect water quality, which includes regulation of storm water and wastewater discharges during construction and operation of a facility. California established its regulations to comply with the CWA under the Porter-Cologne Water Quality Control Act.
Clean Water Act, Section 316(b)	The State Water Resources Control Board implements the Federal Clean Water Act (CWA) (§316(b)) regulations on cooling water intake structures and is critical to the implementation of the Statewide Policy on the Use of Coastal and Estuarine Waters for Power Plant Cooling (Policy). CWA, Section 316(b) states, "Any standard established pursuant to section 301 or section 306 of this Act and applicable to a point source shall require that the location, design, construction, and capacity of cooling water in-take structures reflect the best technology available for minimizing adverse environmental impact." The Policy establishes technology-based standards to implement federal Clean Water Act section 316(b) and reduce the harmful effects associated with cooling water intake structures on marine and estuarine life. The Policy applies to the 19 existing power plants (including two nuclear plants) that currently have the ability to withdraw over 15 billion gallons per day from the State's coastal and estuarine waters using a single-pass system, also known as once-through cooling (OTC). Closed-cycle wet cooling has been selected as Best Technology Available (BTA). Permittees must either reduce intake flow and velocity (Track 1) or reduce impacts to aquatic life comparably by other means (Track 2).
State LORS	

California Constitution, Article X, section 2	The California Constitution requires that the water resources of the state be put to beneficial use to the fullest extent possible and states that the waste, unreasonable use or unreasonable method of use of water is prohibited.
Senate Bill 610 (Water Code Sections 10910-10915)	Signed into law in 2001 amending Sections 10910-10915 of the California Water Code. Requires public water systems to prepare water supply assessments (WSA) for certain defined development projects subject to the California Environmental Quality Act. Lead agencies determine, based on the WSA, whether protected water supplies will be sufficient to meet project demands along with the region's reasonably foreseeable cumulative demand under average-normal-year, single-dry-year, and multiple-dry-year conditions.
The Porter-Cologne Water Quality Control Act of 1967, California Water Code Section 13000 et seq.	Requires the State Water Resources Control Board (SWRCB) and the nine Regional Water Quality Control Boards (RWQCBs) to adopt water quality criteria to protect state waters. Those regulations require that the RWQCBs issue waste discharge requirements (WDRs) specifying conditions for protection of water quality as applicable. Section 13000 also states that the state must be prepared to exercise its full power and jurisdiction to protect the quality of the waters of the state from degradation. Although Water Code 13000 et seq. is applicable in its entirety, the following specific sections are included as examples of applicable sections.
California Water Code Section 13240, 13241, 13242, 13243, & Water Quality Control Plan: Los Angeles Region (Basin Plan)	The Basin Plan establishes water quality objectives that protect the beneficial uses of surface water and groundwater in the Region. The Basin Plan describes implementation measures and other controls designed to ensure compliance with statewide plans and policies and provides comprehensive water quality planning.
California Water Code Section 13260	This section requires filing, with the appropriate RWQCB, a report of waste discharge that could affect the water quality of the state unless the requirement is waived pursuant to Water Code section 13269.
California Water Code Section 13550	Requires the use of recycled water for industrial purposes when available and when the quality and quantity of the recycled water are suitable for the use, the cost is reasonable, the use is not detrimental to public health, and the use will not impact downstream users or biological resources.
Water Recycling Act of 1991 (Water Code 13575 et. seq.)	The Water Recycling Act states that retail water suppliers, recycled water producers, and wholesalers should promote the substitution of recycled water for potable and imported water in order to maximize the appropriate cost-effective use of recycled water in California.
Water Conservation Act of 2009 (Water Code 10608 et. seq)	This 2009 legislative package requires a statewide 20% reduction in urban per capita water use by 2020. It requires that urban water retail suppliers determine baseline water use and set reduction targets according to specified requirements, and requires agricultural water suppliers prepare plans and implement efficient water management practices.
California Code of Regulations, Title 17	Requires prevention measures for backflow prevention and cross connections of potable and non-potable water lines.
California Code of Regulations, Title 20, Division 2, Chapter 3, Article 1	The regulations under Quarterly Fuel and Energy Reports (QFER) require power plant owners to periodically submit specific data to the California Energy Commission, including water supply and water discharge information.

SWRCB Order 2009-0009-DWQ	The SWRCB regulates storm water discharges associated with construction affecting areas greater than or equal to 1 acre to protect state waters. Under Order 2009-0009-DWQ, the SWRCB has issued a National Pollutant Discharge Elimination System (NPDES) General Permit for storm water discharges associated with construction activity. Projects can qualify under this permit if specific criteria are met and an acceptable Storm Water Pollution Prevention Plan (SWPPP) is prepared and implemented after notifying the SWRCB with a Notice of Intent.
SWRCB Order No. 00-084, NPDES No. CA0001147	This SWRCB permit regulates all operational water discharges from the El Segundo Energy Center site, including once-through cooling water, storm water, and industrial process water.
Los Angeles Regional Water Quality Control Board, Order No. R4-2007-0021	The Los Angeles Regional Water Quality Control Board issued this order to regulate discharges of "Wastewaters from Investigation and/or Cleanup of Petroleum Fuel Pollution."
Los Angeles Regional Water Quality Control Board, Order No. R4-2007-0022	The Los Angeles Regional Water Quality Control Board issued this order to regulate discharges of "Volatile Organic Compounds Contaminated Groundwater."
Local LORS	
City of Manhattan Beach Code, Chapter 5.36 – Sewers, Sewage Disposal	Defines local fees for sewer connections and services.
City of El Segundo Code, Title 11, Chapter 1 – Water Services	Defines local fees for potable water connections and services.
State Policies and Guidance	
Integrated Energy Policy Report (Public Resources Code, Div. 15, Section 25300 et seq.)	In the 2003 Integrated Energy Policy Report (IEPR), consistent with SWRCB Policy 75-58 and the Warren-Alquist Act, the Energy Commission clearly outlined the state policy with regards to water use by power plants, stating that the Energy Commission would approve the use of fresh water for cooling purposes only where alternative water supply sources and alternative cooling technologies are shown to be "environmentally undesirable" or "economically unsound." The IEPR policy also requires the use of zero-liquid discharge (ZLD) technologies unless such technologies are shown to be "environmentally undesirable" or "economically unsound."
SWRCB Res. 2009-0011 (Recycled Water Policy)	This policy supports and promotes the use of recycled water as a means to achieve sustainable local water supplies and reduction of greenhouse gases. This policy encourages the beneficial use of recycled water over disposal of recycled water.
SWRCB Res. 75-58	The principal policy of the SWRCB that addresses 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 states that use of fresh inland waters should only be used for cooling if other sources or other methods of cooling would be environmentally undesirable or economically unsound.

SWRCB Res. 77-1	SWRCB Resolution 77-1 encourages and promotes recycled water use for non-potable purposes and use of recycled water to supplement existing surface and groundwater supplies.
SWRCB Res. 2010-0020	SWRCB's Resolution No. 2010-0020 and adoption of a Policy for the Use of Coastal and Estuarine Waters for Power Plant Cooling (OTC Plan), requires all coastal power plants that utilize OTC to meet new performance requirements (Best Technology Available [BTA]) through a reduction in intake volume and velocity.

PROJECT DESCRIPTION

The ESPFM would be located in the city of El Segundo, Los Angeles County, California on the northern portion of the existing ESEC site. The site is approximately 33 acres in size.

Originally built in the 1950s, the ESEC was a 1,052-megawatt (MW) power plant consisting of four natural gas-fired utility boiler generating units. In 2000, the project owner applied to the Energy Commission to demolish and replace Units 1 and 2 with combined cycle Units 5, 6, and 7 and continue the use of once-through cooling. The project was certified by the Energy Commission on February 3, 2005. In 2007, the owner petitioned to amend the 2005 Decision to install smaller rapid start combined cycle units using dry cooling technology and designated them Units 5 & 6 and 7 & 8. The Commission approved this petition on June 30, 2010. The project commenced commercial operation August 1, 2013.

Currently proposed modifications include the demolition and replacement of two once-through-cooled natural gas-fired utility boiler units, Units 3 and 4, with one new combined cycle (a combustion turbine generator (Unit 9) with a steam turbine generator (Unit 10)) and two simple-cycle gas turbines (Units 11 and 12). This change will eliminate the use of ocean water for once-through cooling at the facility. The proposed changes will also upgrade and improve the ESEC's existing and approved site infrastructure, provide fast start and dispatch flexibility capabilities to support Southern California grid load balancing and renewable energy integration, and implement improvements to coastal access (NRG 2013a).

The timing for implementation of the ESEC (00-AFC-14C) resulted in the shut-down of Unit 3 on July 22, 2013, and the eventual shutdown of Unit 4 by December 31, 2015, to coincide with the State of California's once-through-cooling policy for ESPFM with a stated compliance obligation of December 31, 2015. Commencement of demolition of Units 3 and 4 is planned for the end of 2015. Construction of the proposed Units 9, 10, 11, and 12 is anticipated to commence by mid-2016, after Units 3 and 4 are removed, and conclude in 2018, to meet a projected on-line date of summer 2018. The existing cessation of generation from Units 3 and 4, followed by their demolition, and proposed Units 9 – 12 construction, operation, and generation, is subject to an approved power purchase agreement (NRG 2013a).

WATER SUPPLY

Similar to the permitted project design, water will be supplied from two sources: potable water from the city of El Segundo and California State Title 22 recycled water from the West Basin Municipal Water District (West Basin). The ESPFM will use water from the city for potable use and fire emergencies. The Title 22 recycled water, first-pass reverse osmosis (RO) product water received from the West Basin will be used as the supply to the cycle makeup treatment system as well as makeup to the inlet cooling. Title 22 recycled water will be blended with the single-pass RO product water for use in the gas turbine inlet cooling. The proposed plant design will utilize two air-to-air heat exchangers (air cooled condensers) for thermal cycle heat rejection. Seawater will no longer be used for heat rejection.

ESPFM proposes to use potable water for construction activities. Average water use during construction would be about 5,000 gallons per day (gpd) and around 20,000 gpd during hydrostatic testing and commissioning. Commissioning is expected to take about 60 days. Average annual potable water use is not expected to exceed 5.6 AFY. Staff notes that tertiary treated recycled water is available and is a suitable substitute for the proposed uses of potable water during project construction. Staff believes the project owner should be required to use recycled water for construction activities and provides further analysis supporting this recommendation below.

The proposed ESPFM would employ 50 full-time employees. The expected water use for domestic purposes would be about 0.5 gpm, or about 1 AFY (NRG 2013a).

The city of El Segundo purchases water from West Basin, a member agency of the Metropolitan Water District (MWD). One hundred percent of the drinking water the city of El Segundo distributes is received from the MWD. MWD treats all of its water at its filtration plants to standards set by the State of California before delivery to El Segundo. MWD supplies water from both the Colorado River and from the Sacramento-San Joaquin Delta in northern California. MWD delivers water to the city of El Segundo after it has been treated in the Joseph Jensen Filtration Plant, (located in Granada Hills) and/or the F.E. Weymouth Filtration Plant (located in La Verne).

PROCESS WASTE WATERS

Process wastewaters from the combined cycle will consist of heat recovery steam generation (HRSG) and inlet evaporative cooler blowdown. In addition, wastewater will be generated during off-line water washing of the 7FA.05 and Trent 60 compressors. HRSG and evaporative cooler blowdown streams will be recycled back to the single-pass RO water storage tank, partly for reprocessing by the mobile demineralizers and partly for reuse as make-up to the inlet coolers. Off-line water wash effluent will be impounded and disposed of at an appropriately licensed offsite facility. Waste streams will be sampled in accordance with the existing monitoring and reporting program to ensure that the chemistry of the process waste is within the limits of the discharge permits. While process wastewater from the CC Fast and Rolls Royce Trent 60 peaker unit system will be recycled when possible, wastewater will be disposed of offsite as necessary if the water cannot be recycled and processed in a manner to meet the CC

Fast and Rolls Royce Trent 60 peaker unit system water quality objectives (NRG 2013a).

No process wastewater will be discharged from the facility via the existing retention basin or either outfall structure. The ESPFM is proposed as a zero-liquid-discharge facility where only stormwater and sanitary effluent will leave the site (NRG 2013a).

SANITARY WASTE WATER

Sanitary wastewater, including eyewash station water and shower water, will be directed to the city of Manhattan Beach Municipal Sanitary Sewer in accordance with the City Public Works Department's discharge requirements. Expected discharge from the sanitary sewer would be about 750 gallons per day (NRG 2013a).

STORMWATER

Stormwater generated during construction will be discharged under an existing Construction Stormwater National Pollutant Discharge Elimination System discharge permit obtained in compliance with existing Condition of Certification **WATER QUALITY-7** and **WATER QUALITY-9**. All stormwater will be collected in yard drains that will route stormwater to an oil/water separator prior to discharge into the Pacific Ocean via Outfall 002. During a storm, discharge could be as high as 3,100 gallons per day (NRG 2013a).

SETTING

GROUNDWATER

The ESPFM 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 ESPFM 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 ESPFM 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 (ESPR 2000a).

Depth to water at the site ranges between 7 to 12 feet below land surface. The groundwater gradient beneath the site in the Old Dune/Gage aquifer is toward the northwest at about 0.0015 foot per foot (WC 1997).

SURFACE WATER AND FLOODING

Surface watersheds in California are divided into management areas by the State's Regional Water Quality Control Boards based on political and physiographic boundaries. The ESPFM would be within the area regulated by the Los Angeles Regional Water Quality Control Board (RWQCB). The site is located within the Los Angeles-San Gabriel hydrologic area and is part of the Santa Monica Bay-San Pedro Bay subarea. The RWQCB lists the Santa Monica Bay as impaired (on the 303(d) list) for DDT, debris, polychlorinated biphenyls (PCBs), and sediment. The project site gets about 12-inches per year of precipitation (OWP 2013).

The site is located in a Federal Emergency Management Area (FEMA) Zone X, which indicates the site is at an elevation above the 100-year floodplain. See Soil & Water Figure 1.

SOILS

The existing ESEC site is at about 20 feet above mean sea level (msl) and is relatively flat. Santa Monica Bay is located west of the site. 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.

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. The proposed final elevation would be approximately 20 feet above msl (ESPR 2000a).

CONTAMINATED SOILS AND GROUNDWATER

A Phase I Environmental Site Assessment (ESA) dated November 2000, identified "recognized environmental conditions" that may exist on the ESEC site and along the proposed pipelines. The ESA also determined that "…total petroleum hydrocarbons (TPH) and volatile organic compounds (VOCs) have been detected in soil and groundwater beneath ESEC. Quarterly groundwater monitoring is conducted by Chevron in accordance with the Los Angeles RWQCB 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):

- ESEC Site: The soil and groundwater below the site contains total petroleum hydrocarbons (TPH) and volatile organic compounds (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.

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

This section provides an evaluation of the expected direct, indirect, and cumulative impacts to soil and water resources that could be caused by construction, operation, and maintenance of the ESPFM. Staff's analysis consists of the following steps: establishing "thresholds of significance" used to determine if there is a potentially "significant" impact, gathering data related to construction and operation of the project, screening the data against the thresholds of significance then reaching a conclusion to determine whether or not the project presents a potentially "significant" impact. If staff determines there is a significant impact then staff evaluates the project owner's proposed mitigation for sufficiency and staff may or may not recommend additional or entirely different mitigation measures that are potentially more effective than those proposed by the project owner. Mitigation is designed to reduce the effects of potentially significant ESPFM impacts to a level that is less than significant.

SOIL RESOURCES

Staff evaluated the potential impacts to soil resources including the effects of construction and operation activities that could result in erosion and downstream transportation of soils and the potential for contamination to soils and groundwater. There are extensive regulatory programs in effect that are designed to prevent or minimize these types of impacts. These programs are effective, and, absent unusual circumstances, an applicant's ability to identify and implement Best Management Practices (BMPs) to prevent erosion or contamination is sufficient to ensure that these impacts would be less than significant. The LORS and policies presented in **SOIL & WATER Table 1** were used to determine the significance of ESPFM impacts.

WATER RESOURCES

Staff evaluated the potential of ESPFM to cause a significant depletion or degradation of surface water and groundwater resources. Staff considered compliance with the LORS and policies presented in **SOIL & WATER Table 1** and whether there would be a significant impact under the CEQA.

To determine if significant impacts to soil or water resources would occur, the following questions were addressed. Where a potentially significant impact was identified, staff or the project owner proposed mitigation to ensure the impacts would be less than significant.

- Would the project violate any water quality standards or waste discharge requirements?
- Would the project substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level?

- Would the project substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?
- Would the project substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?
- Would the project create or contribute runoff water which would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff?
- Would the project otherwise substantially degrade water quality?
- Would the project place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?
- Would the project place within a 100-year flood hazard area structures which would impede or redirect flood flows?
- Would the project expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?
- Would the project be inundated by seiche or tsunami?
- Would the project result in substantial soil erosion or the loss of topsoil?
- Does the project have impacts that are individually limited, but cumulatively considerable?

DIRECT/INDIRECT IMPACTS AND MITIGATION

A discussion of the direct and indirect ESPFM construction, operation, and demolition impacts and mitigation is presented below. For each potential impact evaluation, staff describes the potential effect and then analyzes potential impacts by applying threshold criteria for determining significance. If mitigation is warranted, staff provides a summary of the project owner's proposed mitigation and a discussion of the adequacy of the proposed mitigation. In the absence of project owner-proposed mitigation, or if mitigation proposed by the project owner is inadequate, staff mitigation measures are recommended.

WATER QUALITY

Construction Water Discharges

Approximately 5.5 acres of land would be disturbed for each power block that gets demolished. Therefore approximately 11 acres of disturbance is expected for the demolition of Units 3 and 4 and the installation of Units 9, 10, 11, and 12. ESPFM construction would also require both onsite and offsite laydown and construction parking

areas. The offsite laydown and parking area is approximately 12 acres, of which 10 acres are usable, located at 777 W. 190th Street in the city of Gardena, near the 405 and 110 freeway interchange. The site is less than 10 miles southeast of the proposed project. The site has been used for construction laydown for the ESEC project since 2011 and will return to its prior use for commercial truck, RV, and automobile storage until new construction would commence in 2016. The offsite laydown site is paved, lighted, and enclosed with a perimeter fence and has an approximately 5,500 square foot industrial building on the property (NRG 2013a).

If not managed properly, operations or construction activities at the ESPFM would have the potential to contaminate storm water runoff and thereby impact local surface waters, specifically the Santa Monica Bay (Pacific Ocean). Ocean waters in the vicinity are protected from degradation by the Los Angeles RWQCB Basin Plan.

The discharge for the site would be subject to regulation based on Beneficial Uses identified in the Los Angeles RWQCB Basin Plan as Manhattan Beach. The site would be subject to regulations by the RWQCB to protect the following beneficial uses.

- Navigation (NAV)
- Water Contact Recreation (REC1)
- Non-Contact Water Recreation (REC2)
- Commercial and Sportfishing (COMM)
- Wildlife Habitat (WILD)
- Rare, Threatened, or Endangered Species (RARE)
- Spawning, Reproduction, and Development (SPWN)
- Marine Habitat (MAR)
- Shellfish Harvesting (SHELL)

During construction, operation, and demolition the existing stormwater collection system would be used to collect and process stormwater from the site. Stormwater that falls within process equipment containment areas would be collected and discharged to the existing process drain system, which consists of oil/water separation treatment prior to discharge at Outfall 002. Stormwater that falls within the plant-wide pavement areas and outside the process equipment containment areas would be routed to Outfall 002 without treatment. The residual oil containing sludge from the oil/water separators would be collected via vacuum truck and disposed of as hazardous waste. See the **Waste Management** section of this document for details about disposal locations and quantities.

All stormwater will be collected in yard drains that will route stormwater to an oil/water separator prior to discharge into the Pacific Ocean via Outfall 002. During a storm, discharge could be as high as 3,100 gallons per day (NRG 2013a). Stormwater discharge volume is not expected to differ between the existing and the proposed project.

Stormwater generated during construction and demolition will be discharged in accordance with the existing Construction Stormwater National Pollutant Discharge Elimination System (NPDES) discharge permit (SWRCB Order No. 2009-0009-DWQ). To ensure compliance with this order, the project owner should be required to comply

with Condition of Certification **SOIL&WATER-1** which requires a construction Storm Water Pollution Prevention Plan (SWPPP) for the ESPFM site and laydown areas. The SWPPP would specify BMPs that would prevent all construction and demolition pollutants, including erosion products, from contacting storm water, eliminate or reduce non-storm water discharges to waters of the Pacific Ocean, and require inspection and monitoring of BMPs.

At this time it is unclear if the project owner will perform hydrostatic testing, or if so, where it would be discharged. Hydrostatic testing often involves the use of chemicals that have the potential to impact surface waters. If the proposed project performs hydrostatic testing of pipelines or other industrial equipment and chooses to discharge the effluent to the waters of the United States, compliance with an additional permit may be required by the RWQCB. Permit Order No. R4-2009-0068 (General NPDES Permit No. CAG674001) allows for the discharges of low threat hydrostatic test water to surface waters. If necessary, the project owner would be required to comply with Condition of Certification **SOIL&WATER-2**, which would require the project owner to obtain permit coverage for hydrostatic discharges under Permit Order NO. R4-2009-0068.

Operations Water Discharge

No process wastewater will be discharged from the facility via the existing retention basin or either outfall structure. The ESPFM is proposed as a zero-liquid-discharge facility where only stormwater and sanitary effluent will leave the site (NRG 2013a). As stated above, all stormwater will be collected in yard drains that will route stormwater to an oil/water separator prior to discharge into the Pacific Ocean via Outfall 002. During a storm, discharge could be as high as 3,100 gallons per day (NRG 2013a). This stormwater discharge would require coverage under this site's existing discharge permit, NPDES CA0001147 Order No. 00-084, to minimize the discharge of conventional, non-hazardous pollutants from industrial stormwater discharge.

With implementation of BMPs and associated monitoring activities included in NPDES CA0001147 Order No. 00-084, impacts to water quality from operation of the proposed ESPFM would be less than significant. Staff proposes Condition of Certification **SOIL&WATER-3** which would require the project owner to continue coverage under NPDES CA0001147 Order No. 00-084 through project operation.

Sanitary Wastewater

Sanitary wastewater, including eyewash station water and shower water, will be directed to the city of Manhattan Beach Municipal Sanitary Sewer in accordance with the City Public Works Department's discharge requirements and in accordance with existing Conditions of Certification from the amended 00-AFC-14 Final Decision. The estimated volume of the facility's sanitary wastewater discharge remains unchanged. The calculation of 750 gpd assumes an average daily flow of 0.52 gallons per minute (gpm) total from all sanitary waste streams. city of Manhattan Beach Code, Chapter 5.36 defines the fees required by the city for the connection to their sewer system. Staff proposes that the project owner comply with this code section and with Condition of Certification **SOIL&WATER-4**, which would require that the project owner pay the fees normally required by the city for sanitary sewer connections.

Contaminated Groundwater

Groundwater dewatering may be necessary during demolition (ESPR 2000a). Due to the site's long industrial history, staff is concerned that pumping of contaminated groundwater could result in significant impacts to on and offsite water resources or sensitive environmental receptors. The project owner did not provide information about how, or if, contaminated groundwater would be discharged, or what volumes may be expected.

Staff suggests that the project owner file a Report of Waste Discharge (ROWD) Form 200 with the Los Angeles RWQCB. At this time, the RWQCB would require a characterization of the groundwater to be discharged and identify a discharge or outfall location. If the project owner decides to get coverage under an NPDES permit, that permit would be regulated under exclusive authority of the RWQCB. If the project owner chooses to enroll under a non-NPDES permit, the authority to regulate the discharge would be shared by the Los Angeles RWQCB and the Energy Commission.

If groundwater dewatering is necessary, the project owner shall file a ROWD with the Los Angeles RWQCB. Staff proposes Condition of Certification **SOIL&WATER-5**, which would require the project owner to apply for coverage under the appropriate discharge permit if the project owner engages in groundwater dewatering at the proposed site.

WATER SUPPLY

Industrial

The proposed project's use of potable water would be significantly less than what is currently permitted. On average, the proposed project would allow for a 96 AFY reduction in fresh water use during operation. Potable water would also be used to fill the fire/service water tanks. These are shown on the process flow diagrams (PTA, Figure 2-8 and 2-9) as requiring "0 gpm." These tanks are assumed to be filled once and reserved for an emergency. The fire/service water does not add a significant annual potable water demand and is not included in **SOIL & WATER Table 2** below.

On average, ESPFM would use about 118 AFY of tertiary treated recycled water provided by the West Basin Municipal Water District for industrial operation. Under a maximum use scenario, up to 137 AFY could be required by the project. Up to 21 AFY of the 118 AFY required by the project would go to landscape irrigation under average conditions, and up to 27 AFY of the 137 AFY could go to landscaping under maximum use conditions. Process water will be used for the generator turbine wash, evaporative cooling blowdown makeup, water treatment, and other purposes. The proposed use would be an increase in total recycled water supply above baseline. An increase in recycled water use is preferred by California Water Code Section 13550, which encourages the use of available recycled water supplies.

The above-described modifications to the project's water uses will also enable it to eliminate once-through-cooling water use. Under the proposed project, no water would be drawn from the Pacific Ocean for cooling. See the **Biological Section** of this document for details about Clean Water Act, Section 404 and 401 compliance, related to the plugging of the ocean intake pipes.

A summary of existing and proposed industrial and construction water needs is included in **SOIL & WATER Table 2** below.

SOIL & WATER Table 2
Water supply volumes for proposed ESPFM

City of El Segundo and Manhattan Beach, Potable Water				
	Previously Permitted (AFY)	Proposed (AFY)	Difference (AFY)	Reduction?
Operations Annual Avg.	97	0.72	-96	Yes
Operations Annual Max.	104	0.84	-103	Yes
Construction Annual Avg.	N/A	5.6	5.6	No

West Basin Municipal Water District, Title 22 Recycled Water				
	Previously Permitted (AFY)	Proposed (AFY)	Difference (AFY)	Reduction?
Operations Annual Avg.	112	118	6	No
Operations Annual Max.	120	137	17	No

Ocean Water				
	Previously Permitted (AFY)	Proposed (AFY)	Difference (AFY)	Reduction?
Operations Annual Avg.	200,000	0	-200,000	Yes
Operations Annual Max.	399,000	0	-399,000	Yes

To ensure that project water use is within the projected volumes analyzed herein, staff proposes Conditions of Certification **SOIL&WATER-6** and **SOIL&WATER-7**, which would require the project owner to abide by an annual use limit of 137 AFY, and meter and report facility water use in compliance reports. If **SOIL&WATER-6** and **SOIL&WATER-7** are implemented as proposed, impacts to local water supplies from industrial operation would be beneficial and less than significant.

The proposed project also would require a recycled water contract with the West Basin for the long-term supply (30-35 years) of tertiary treated recycled water. Staff proposes Condition of Certification **SOIL&WATER-8**, which would require the project owner to execute a recycled water agreement with the West Basin.

Construction

Average daily use of construction water is expected to be about 5,000 gallons, or about 5.6 AFY. During hydrostatic testing, water usage is estimated at 20,000 gallons per day, or 22.4 AFY. The project owner proposes to use potable water for construction. Staff believes that given the availability of recycled water and its current use at the ESEC, the ESPFM project should be constructed using tertiary treated recycled water. The

recycled water supply currently available at the site would be suitable for use in dust suppression, concrete mixing, hydrostatic testing, and compaction. Staff believes it is appropriate to maximize the use of recycled water where potable water supplies can be preserved for other beneficial uses. This use would also be consistent with Energy Commission Water Policy and Section 13550 of the California Water Code. Further analysis of LORS compliance is provided below. If Condition of Certification **SOIL&WATER-6** and **SOIL&WATER-7** are implemented as proposed, impacts to local water supplies from construction would be less than significant.

Domestic

The proposed project would receive potable water from the city of El Segundo, via a 14-inch pipeline already on site. The pipeline would supply about 0.84 AFY under typical operating conditions and up to 4 AFY during an emergency where recycled water is not available. The proposed annual average use of 0.84 AFY is a significant reduction in potable water use below the baseline. Potable water is currently used for industrial purposes at the existing ESEC Units 3 and 4, but is proposed for only potable uses for onsite personnel after ESPFM is operational. As a result, a minimal amount of potable water will be used for sanitary use, drinking, eye wash, and safety showers, as well as fire protection water.

City of El Segundo Code, Title 11, Chapter 1 – Potable Water Connections, defines the fees required by the city. Staff proposes that the project owner comply with this code section and with Condition of Certification **SOIL&WATER-4,** which would require that the project owner pay the fees normally required by the city for potable water connections.

The proposed project also would require a potable water contract with the city of El Segundo. Staff proposes Condition of Certification **SOIL&WATER-9**, which would require the project owner to execute a potable water agreement with the City.

FLOODING

Staff reviewed the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) for the city of El Segundo (06037C1770F). The proposed project is located in Zone X and protected from the 1 percent annual chance of flooding (100-year flood) (FEMA 2008). **SOIL & WATER Figure 1** shows the site location relative to the local FIRM designations.

Flood hazard maps were revised for the city of El Segundo on September 28, 2008, which should provide some confidence about the proposed project's protection from inundation in the near future. FEMA flood maps are however subject to revision.

Projected sea-level rise due to climate change has the potential to reduce the effectiveness of local flood protection. The local protection from inundation is projected to be reduced up to 30 centimeters (1.0 feet) by 2030 and 61 centimeters (2.0 feet) by 2050 (relative to 2000 levels) (CEC 2009; NAS 2012). A significant rise in local sea water levels would also raise the fluvial base level thereby potentially increasing the rate and extent of flooding.

The proposed final elevation would be approximately 20 feet above mean sea level (msl) (ESPR 2000a). According to the FEMA map, the nearest 100-year flood zone could reach an elevation of 15 feet above msl. These elevations suggest that the site has about five feet of elevation separation from the 100-year flood zone. The current projections of sea-level rise could reduce the separation between the site and sea level by up to 2.0 feet by 2050. However, if the minimum separation between the site and the surrounding floodplain is reduced from five feet to three feet, there would still be some level of flood protection.

STORM SURGE AND WAVE RUN-UP

Storm surge is usually defined by increased ocean water levels that occur during storms. Much like precipitation events and rainfall runoff events, storm surge events can be assigned recurrence intervals, e.g. 10-year, 100-year, etc. Storms may result in ocean water level increases that create increased threats of local flooding for shoreline property.

Coastal ecosystems, development, and public access are most at risk from short term storm events, including the confluence of large waves, storm surges, and high astronomical tides during a strong El Niño climatic event (OPC 2013).

Over the next few decades, episodes of heightened sea level associated with large winter storms and anomalous short period climate patterns will be of greater concern to infrastructure and development in coastal areas than the relatively slow increases that are projected in association with global sea-level rise alone (OPC 2013). The coast of California has experienced two very large El Niño events over the past 30 years, in 1982 - 83 and 1997-98, when large storms resulted in hundreds of millions of dollars in storm damage to private property and public infrastructure. The damages occurred from a combination of elevated sea levels and large storm waves, especially when these factors coincided with high tides. During the 1983 El Niño event, sea levels were the highest ever recorded in San Diego, Los Angeles and San Francisco, 29.0 cm (11.4 in.), 32.3 cm (12.7 in), and 53.8 cm (21.2 in.), respectively, above predicted high tides. The water levels reached during these large, short term events have exceeded mean sea levels projected for 2030 and approach the values projected for 2050(OPC 2013).Future sea level needs to be a starting point for project design considerations. Where feasible, consideration needs to be given to scenarios that combine extreme oceanographic conditions on top of the highest water levels projected to result from sea level rise over the expected life of the project.

Tebaldi et al., 2012, modeled the impacts of global sea level rise from climate change on storm surges and reported on the history and expected trends of storms at the Los Angeles Harbor (gauge 9410660). The 100-year return level storms in this area would result in an increase of the ocean surface elevation of about 3 feet. Projections for local sea-level rise do not indicate that there would be any relative influence on the magnitude of the 100-year storm surge. Therefore the 100-year storm surge in 2050 is expected to be the same as today, about one meter.

As was concluded in the “Flooding” section above, a worst-case prediction shows that the site could have as little as three feet of separation from the adjacent flood zone.

Ocean storm surges are considered in the FEMA coastal FIRM modeling, which indicates that the site currently has five feet of separation from the coastal flood zone. Therefore staff concludes there will be limited potential impact from storm surge during the life of the facility.

TSUNAMI AND SEICHE

The proposed site is not within the zone identified by California Emergency Management Agency (CEMA) as a tsunami inundation zone (**SOIL & WATER Figure 2**). A more detailed discussion of hazards posed by tsunami and seiche is included in the **Geology & Paleontology** section of this document.

CUMULATIVE IMPACTS AND MITIGATION

A project may result in a significant adverse cumulative impact where its effects are cumulatively considerable. "Cumulatively considerable" means that the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of reasonably foreseeable future projects (California Code of Regulations, Title 14, section 15130). The construction and operation activities of the various projects could potentially overlap and result in cumulative impacts to the same resource(s).

POTABLE WATER SUPPLY

The proposed project would create a net benefit for local water supplies, when considered cumulatively with any other project. The proposed project could result in an average net reduction of 96 AFY of potable water use. When considered cumulatively this 96 AFY benefit could be reduced by other new users, but would still be considered a net benefit to the local water supply system.

WATER QUALITY

When considered cumulatively with other proposed projects, the ESPFM would result in a net cumulative benefit to the Pacific Ocean water quality. Industrial discharge flows would decrease because of decreased plant water use and elimination of once-through-cooling. The permitted average discharge flows are about 200 mgd and could be eliminated. This would be a 200 mgd reduction in water volume to the ocean and a proportional decrease in pollutant loading. When considered cumulatively this 200 mgd benefit could be reduced by other new users, but would still be considered a net benefit by reducing pollutant loads to the Pacific Ocean.

COMPLIANCE WITH LORS

The Energy Commission’s power plant certification process requires staff to review each of the proposed project’s elements for compliance with LORS and state policies. Staff has reviewed the project elements and concludes that the proposed ESPFM project would comply with all applicable LORS addressing protection of water resources, storm water management, and erosion control, as well as drinking water, use of freshwater, and wastewater discharge requirements, as long as staff’s proposed

conditions of certification are adopted and implemented. Summary discussions of project compliance with significant LORS and policies are provided below.

STORMWATER

Clean Water Act

Staff has determined that ESPFM would satisfy the requirements of the National Pollutant Discharge Elimination System (NPDES) permit with the adoption of Conditions of Certification **SOIL&WATER-1, SOIL&WATER -2,** and **SOIL&WATER -3**. These conditions would ensure that the project owner complies with the appropriate NPDES permits.

Porter-Cologne Water Quality Control Act

Staff has concluded that the ESPFM would satisfy the applicable requirements of the Porter-Cologne Water Quality Control Act and adequately protect the beneficial uses of waters of the state through implementation of federal, state, and local requirements for management of storm water discharges and pollution prevention, compliance with local grading and erosion control requirements, and compliance with local onsite wastewater system requirements.

ONCE THROUGH COOLING, CLEAN WATER ACT SECTION 316(B) COMPLIANCE

The proposal to remove existing once-through cooling processes at ESEC is a means to meet the State's once-through cooling policy, consistent with ESEC's stated OTC Implementation Plan to retire Units 3 and 4 by December 31, 2015, and replace the generation via Track 1 compliance path. The proposed project would comply with CWA, Section 316(b), if the proposed design is implemented.

SWRCB Policy 75-58 and Energy Commission—Integrated Energy Policy Report (IEPR)-Power Plant Water Use and Wastewater Discharge Policy

The California Energy Commission, under legislative mandate specified in the *2003 Integrated Energy Policy Report*, (policy) and State Water Resources Control Board Resolution 75-58, will approve the use of fresh water for cooling purposes by power plants it licenses only where alternative water supply sources and alternative cooling technologies are shown to be environmentally undesirable or economically unsound. The IEPR policy also requires the use of zero-liquid discharge (ZLD) technologies unless such technologies are shown to be "environmentally undesirable" or "economically unsound."

The ESPFM proposes to use dry cooling technology to reduce the amount of water required for plant operation. The air-cooled condenser would allow for the elimination of wet cooling and significantly reduce the plant's water needs, by about 96 AFY compared to the baseline. Staff concurs with the project owner that the use of an air cooled condenser is an economically sound practice that provides environmental benefits from significantly reduced water use.

In addition, the Energy Commission's water policy also seeks to protect water resources from power plant wastewater discharges. To that end, the water policy specifies that the Energy Commission will require zero liquid discharge technologies (for management of power plant wastewaters) unless such technologies are shown to be 'environmentally undesirable' or 'economically unsound. The ESPFM would utilize ZLD technologies and allow for a substantial reduction (200 mgd) in wastewater volume to the Pacific Ocean.

The proposed project would use recycled water for its industrial purposes. The use of recycled water is preferred by state water policy because it conserves fresh water supplies. The proposed project would help to increase the use of local recycled water and save other higher quality water supplies for other beneficial uses.

The proposed project would reduce fresh water use by using recycled water and eliminate a significant portion of process wastewater discharge from the facility. Therefore, staff finds that the proposed water use wastewater management methods would be in compliance with the intent of the water policy.

RECYCLED WATER

California Water Code Section 13550 and 13575 et seq. (Water Recycling Act)

These sections of the California Water Code require that the water resources of the state be put to the highest possible beneficial use and prohibit the use of potable domestic water for non-potable uses if recycled water is available. Within these sections, use of potable domestic water for industrial cooling towers is identified as a waste or unreasonable use of water if suitable recycled water is available.

The proposed project would reduce fresh water use by using recycled water for the generator turbine wash, evaporative cooling blowdown makeup, water treatment, and other purposes. As discussed in the analysis above, recycled water is already available at the site and is of suitable quality for use in project construction activities. Therefore, staff believes that the use of recycled water for construction is feasible and proposes Condition of Certification **SOIL&WATER-6**, to ensure that project water use would be in conformance with Section 13550.

WATER SUPPLY ASSESSMENT

California Water Code, Sections 10910-10915

These sections of the California Water Code do not apply to the proposed project. The proposed project would use recycled water for industrial purposes. These sections of the code only apply when potable water use will put a significant new demand on the local water supply system.

LOCAL LORS

Staff concludes that with the implementation of Conditions of Certification **SOIL&WATER- 4** the ESPFM would satisfy the applicable requirements of all local

LORS by paying necessary local connection fees to the city of El Segundo for water supply and the city of Manhattan Beach for sanitary sewer disposal services.

NOTEWORTHY PUBLIC BENEFITS

- The proposed project would reduce the amount of potable water used relative to baseline conditions. The reduction in water use would be about 96 AFY, which would result in additional supplies for other beneficial uses.

- The proposed project would result in a 200 mgd reduction in industrial discharge water volume to the Pacific Ocean and a similarly proportional decrease in thermal loading and biological impingement.

- The proposed project would result in the elimination of once-through cooling from the existing ESEC. SWRCB's Resolution No. 2010-0020 and adoption of a Policy for the Use of Coastal and Estuarine Waters for Power Plant Cooling (OTC Plan), requires all coastal power plants that utilize OTC to meet new performance requirements (Best Technology Available [BTA]) through a reduction in intake volume and velocity. The proposed project helps achieve the goals of the OTC Plan through dry-cooling and reduced discharge.

RESPONSE TO AGENCY AND PUBLIC COMMENTS

Staff has responded to one comment from the public below and has not received any agency comments.

Comments from Michelle Murphy: Michelle Murphy in her written comments provided to the Energy Commission on May 8, 2014 asked what government and private industry is doing to study the effects of climate change on the proposed ESPFM.

Staff Response: As mentioned above, El Niño events are increasing (as a result of climate change) and future sea level needs to be a starting point for project design considerations. For this project, staff finds that the elevation of the project site would ensure that the proposed project could be built and operated reliably under the reasonably expected sea level rise over the life of the project. High-end estimates of relative sea-level rise are 61 centimeters (2.0 feet) by 2050 (relative to 2000) (NAS, 2012), which would reduce the site's separation from the floodplain to three feet above the current (2012) 100-year floodplain (FEMA, 2008). See the "Flooding" and the "Storm Surge and Wave Run-up" sections above for further discussion.

CONCLUSIONS

- The proposed project would allow the ESPFM to eliminate once-through-cooling (OTC) which would result in a 200 million gallon per day (mgd) reduction in intake and waste water volume to the Pacific Ocean. State Water Resources Control Board's (SWRCB) Resolution No. 2010-0020 and adoption of a Policy for the Use of Coastal and Estuarine Waters for Power Plant Cooling (OTC Plan), requires all

coastal power plants that utilize OTC to meet new performance requirements (Best Technology Available [BTA]) through a reduction in intake volume and velocity. The proposed project helps achieve the goals of the OTC Plan through dry-cooling and reduced discharge.

- The proposed project would include use of air cooled condensers for cooling of the steam cycle. This technology significantly reduces the potential for use of water supplies and is encouraged in accordance with the Energy Commission's water policy. Also in accordance with the Energy Commission's water policy, the project would use a Zero-Liquid-Discharge system to reuse water and reduce wastewater volume.

- The proposed project would use recycled water exclusively for industrial operation.

- The proposed project's average potable water use during operation would be 96 acre feet per year (AFY) less than current site water use, which would result in additional supplies for other beneficial uses.

- The proposed site has a long industrial history and would not require much additional soil disturbance for the new facilities. The proposed project would therefore result in minimal losses to soil resources. Though some small losses in topsoil are expected during construction and operation from wind and water erosion, onsite management of stormwater runoff and sediment erosion as proposed by staff in Conditions of Certification **SOIL&WATER-1** and **SOIL&WATER-3**, would adequately minimize soil loss and pollutant discharge from industrial operation.

- Staff proposes Condition of Certification **SOIL&WATER-2**, which would require the proposed project to comply with the National Pollutant Discharge Elimination System (NPDES) Permit Order No. R4-2009-0068, General NPDES Permit No. CAG674001, if hydrostatic waters are discharged to waters of the US. This condition would ensure that the impacts to waters of the United States from hydrostatic testing would be less than significant.

- Staff proposes Condition of Certification **SOIL&WATER-4**, which would require the project owner to pay the city of El Segundo all the normal fees associated with connections to their water and sewer systems.

- Groundwater at the site is relatively shallow and potentially contaminated by petroleum products or by-products. Trench and foundation excavations may encounter shallow groundwater and dewatering could be required for stabilization. If the project owner engages in dewatering, staff would require that the project owner comply with Condition of Certification **SOIL&WATER-5**, which would require the project owner to apply for coverage under a permit that would allow for the discharge of petroleum-contaminated water.

- Staff proposes Condition of Certification **SOIL&WATER-6**, which would limit the proposed project's maximum industrial water use to 137 AFY during operation, and potable water use to 23 AFY during construction. In addition, Condition of Certification **SOIL&WATER-6** would require use of tertiary treated recycled water

for all construction purposes for which it is suited including dust suppression, concrete mixing, hydrostatic testing, and compaction.

- Staff proposes Condition of Certification **SOIL&WATER-7**, which would require the project owner to install water meters.
- Staff proposes Conditions of Certification **SOIL&WATER-8** and **SOIL&WATER-9**, which would require the project owner to execute both recycled and potable water purchase agreements, respectively.
- The proposed project is located in Zone X and protected from the 1-percent annual chance of flooding (100-year flood).
- The elevation of the project site would ensure that the proposed project could be built and operated reliably under the reasonably expected sea level rise over the life of the project. High-end estimates of relative sea-level rise are 61 centimeters (2.0 feet) by 2050 (relative to 2000) (NAS, 2012), which would reduce the site's separation from the floodplain to three feet above the current (2012) 100-year floodplain (FEMA, 2008).

PROPOSED CONDITIONS OF CERTIFICATION

The original staff analysis and 2007 Amendment were split into two sections addressing Water Quality and Water Resource impacts. In this analysis, staff has combined these sections into the Soil and Water Resources analysis presented above. Staff did this to make the analysis more concise and better facilitate compliance with the conditions of certification given changes in the project design for the current amendment. For completeness, staff shows the conditions of certification that were deleted at the time of the 2007 amendment. Staff also shows Conditions of Certification that were approved with the 2007 Amendment in ~~strikethrough~~. All of the 2007 conditions are shown in strikethrough because they have been updated and revised to reflect current project design. All new language is in **bold** and **<u>underline</u>**.

WATER QUALITY-1: **Deleted at the time of the 2007 Amendment**

WATER QUALITY-2: **Deleted at the time of the 2007 Amendment**

WATER QUALITY-3: **Deleted at the time of the 2007 Amendment**

WATER QUALITY-4: **Deleted at the time of the 2007 Amendment**

WATER QUALITY-5: **Deleted at the time of the 2007 Amendment**

WATER QUALITY-6: **Deleted at the time of the 2007 Amendment**

~~NPDES CONSTRUCTION PERMIT REQUIREMENTS~~

~~**WATER QUALITY-7 :** The project owner shall comply with the requirements of the State Water Resources Control Board's (SWRCB) National Pollutant Discharge Elimination System (NPDES) Permit for Storm Water Discharges Associated with Construction Activity (Water Quality Order 99-08-DWQ <u>and any other subsequent orders</u>). The project owner shall develop and implement a Storm~~

Water Pollution Prevention Plan (Construction SWPPP) for the construction of the ESPRP site, laydown areas including El Segundo Beach, and all linear facilities. The Construction SWPPP shall be reviewed and approved by the City of El Segundo (City) and shall be in compliance with the City's Standard Urban Stormwater Mitigation Plan (SUSMP) per the requirements of the Los Angeles Regional Water Quality Control Board (LARWQCB) NPDES Permit No. CAS0004001 and the City's Ordinance No. 1348 and Chapter 7 of Title 5 of the municipal code.

Verification: Prior to site mobilization, demolition, and/or construction related ground disturbing activities, including those activities associated with the beach delivery and linear facilities, the project owner shall submit to the CPM a copy of the Construction SWPPP that includes the requirements of the City's SUSMP and retain a copy on-site. The project owner shall submit copies to the CPM of all correspondence between the project owner and the City, the LARWQCB, and the SWRCB regarding the City's SUSMP and the Construction SWPPP within 10 days of its receipt or submittal. This information shall include copies of the Notice of Intent and Notice of Termination for the project.

DRAINAGE EROSION AND SEDIMENT CONTROL

WATER QUALITY-8 Drainage, Erosion, and Sediment Control Plan (DESCP): Prior to soil disturbing activities, the project owner shall obtain CPM approval for a site-specific Drainage, Erosion, and Sediment Control Plan (DESCP) that addresses all project elements including those activities related to delivery of equipment from the beach. The DESCP shall be revised to address specific soil disturbing and soil stabilizing activities associated with pre-construction, construction, and post-construction activities. of the ESPRP.

The DESCP shall be consistent with the grading and drainage plan as required by condition of certification **CIVIL-1** and may incorporate by reference any Storm Water Pollution Prevention Plan (SWPPP) developed in conjunction with state or municipal NPDES permits. The DESCP shall contain elements A through I below:

A. Vicinity Map - Map(s) at a minimum scale 1 "=100' shall be provided indicating the location of all project elements with depictions of all significant geographic features including swales, storm drains, and sensitive areas.

B. Site Delineation - All areas subject to soil disturbance for the ESPRP (project site, lay down area, all linear facilities, landscaping areas, and any other project elements) shall be delineated showing boundary lines of all construction areas and the location of all existing and proposed structures, pipelines, roads, and drainage facilities.

C. Watercourses and Critical Areas - The DESCP shall show the location of all nearby watercourses including swales, storm drains, and drainage ditches. The DESCP shall indicate the proximity of those features to the ESPRP construction, lay down, and landscape areas and all transmission and pipeline construction corridors.

D. Drainage Map - The DESCP shall provide topographic site map(s) at a minimum scale 1"=100' showing all existing, interim, and proposed drainage

systems and drainage area boundaries. On the map, spot elevations and contours shall be extended off-site for a minimum distance of 100 feet.

E. Drainage Narrative - The DESCP shall include a narrative of the drainage measures to be taken to protect the site and downstream facilities and include the summary pages from the hydrologic analysis prepared by a professional engineer/erosion control specialist. The narrative shall state the watershed size(s) in acres used in the calculation of drainage control measures and text included that justifies their selection. The hydrologic analysis should be used to support the selection of Best Management Practices (BMPs) and structural controls to divert off-site and on-site drainage around or through the ESPRP construction and laydown areas.

F. Clearing and Grading Plans - The DESCP shall provide a delineation of all areas to be cleared of vegetation and areas to be preserved. The plan shall provide elevations, slopes, locations, and extent of all proposed grading as shown by contours, cross sections or other means. The locations of any disposal areas, fills, or other special features will also be shown. Illustrate existing and proposed topography tying in proposed contours with existing topography.

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

H. Best Management Practices - The DESCP shall identify on a Water Pollution Control Drawing(s) (WPCD) the location of the site specific BMPs to be employed during each phase of construction (initial grading/demolition, excavation and construction, and final grading/stabilization). Treatment control BMPs used during construction should enable testing of stormwater runoff prior to discharge to the stormwater system. BMPs shall include measures designed to prevent wind and water erosion in areas with existing soil contamination.

I. Best Management Practices Narrative - The DESCP shall show the location (as identified on the WPCD), timing, and maintenance schedule of all erosion and sediment control BMPs to be used prior to grading/demolition, project excavation and construction, and final grading/stabilization (accomplished by the submittal of DESCP revisions). Text with supporting calculation shall be included for each project specific BMP. Separate BMP implementation schedules shall be provided for each project element.

Verification: No later than 90 days prior to the start of grading or excavation activities associated with any project element of the ESPRP, the project owner shall submit a copy of the DESCP to the City of El Segundo (City) for review and comment. No later than 60 days prior to the start of grading or excavation activities associated with any project element of the ESPRP, the project owner shall submit the DESCP and the City's

comments to the CPM for review and approval. The CPM shall consider comments received from the City on the DESCP before issuing approval.

The DESCP shall be revised and a revision submitted to the CPM for project excavation/construction and final grading/stabilization prior to the soil disturbing activities associated with these stages of construction. The DESCP shall be consistent with the grading and drainage plan as required by condition of certification CIVIL-1 and relevant portions of the DESCP shall clearly show approval by the Chief Building Official. The DESCP shall be consistent with the Stormwater Pollution Prevention Plan (SWPPP) developed in accordance with the General Construction Permit (Water Quality Order 99-08-DWQ and any other subsequent orders) and the project's Standard Urban Stormwater Mitigation Plan developed in accordance with the LARWQCB NPDES Permit No. CAS0004001 and the City's Ordinance No. 1348 and Chapter 7 of Title 5 of the municipal code.

In the monthly compliance report, the project owner shall provide a narrative describing the effectiveness of the drainage, erosion and sediment control measures; the results of monitoring and maintenance activities, including any BMP inspection reports; and the dates of any dewatering activities.

NPDES INDUSTRIAL PERMIT REQUIREMENTS

WATER QUALITY-9: The project owner shall comply with the requirements of the Individual and/or General NPDES Permit for Storm Water Discharges Associated with Industrial Activity. The project owner shall develop and implement a Storm Water Pollution Prevention Plan (Industrial SWPPP) for the operation of the ESPRP. The Industrial SWPPP shall be reviewed and approved by the City of El Segundo (City) and shall be in compliance with the City of El Segundo's (City) Standard Urban Stormwater Mitigation Plan (SUSMP) per the requirements of the Los Angeles Regional Water Quality Control Board (LARWQCB) NPDES Permit No. CAS0004001 and the City's Ordinance No. 1348 and Chapter 7 of Title 5 of the municipal code.

Verification: The project owner shall submit to the CPM a copy of the Industrial SWPPP that includes the requirements of the City's SUSMP prior to commercial operation and retain a copy on-site. The project owner shall submit to the CPM copies of all correspondence between the project owner and the City, the LARWQCB, and the SWRCB regarding the City's SUSMP and the Individual and/or General NPDES Permit for Storm Water Discharges Associated with Industrial Activity within 10 days of its receipt or submittal. The Industrial SWPPP shall include a copy of the Notice of Intent for the project.

WATER QUALITY-10 Ballast Water Management Plan: The project owner shall ensure that each barge operator develops and implements a Ballast Water Management Plan in accordance with CCR Title 2, Division 3, Chapter 1, Article 4.6, The project owner shall ensure that the ballast water holding tanks are certified clean and uncontaminated by the California State Lands Commission prior to taking on local ballast water.

Verification: No later than 90 days prior to grounding of any barge associated with the delivery of ESPRP equipment over El Segundo Beach, the project owner shall provide

the State Lands Commission with a copy of the Ballast Water Management Plan that is in compliance with Title 2, Division 3, Chapter 1, Article 4.6 for review and comment. At least 60 days prior to grounding of any barge associated with the delivery of ESPRP equipment over El Segundo Beach, the project owner shall provide the CPM for review and approval, a copy of the Ballast Water Management Plan that has been reviewed by the State Lands Commission.

WATER RES-1: **Deleted.**

WATER RES-2: **Deleted.**

WATER RES-3: The project owner shall provide the CPM a copy of the executed and final recycled water purchase agreement (agreement) with West Basin Municipal Water District (WBMWD) for the long-term supply (30 – 35 years) of tertiary treated recycled water to the ESPRP. The agreement shall specify a minimum delivery rate of 602-gpm. The agreement shall specify all terms and costs for the delivery and use of recycled water by ESPRP. The ESPRP shall not connect to WBMWD's new 10-inch recycled water pipeline without the final agreement in place and submitted to the CPM. The project owner shall comply with the requirements of Title 22 and Title 17 of the California Code of Regulations.

Verification: No later than 60 days prior to the delivery of single pass reverse osmosis recycled water from the new 10-inch pipeline, the project owner shall submit two copies of the final and executed recycled water purchase agreement for the supply and on-site use of recycled water at the ESPRP. The project owner shall submit to the CPM a copy of the cross connection inspection and approval report from the Los Angeles County Health Department prior to the delivery of recycled water from the new 10-inch recycled water pipeline.

WATER RES-4: The project owner shall use potable water supplied by the City of El Segundo (City) for potable and sanitary purposes only during construction of the ESPRP. Potable water shall not be used for any construction activity that is suitable for non-potable water use. In the event of a recycled water delivery interruption, potable water may be used as an emergency back-up supply for plant operation.

Prior to completion of the 14-inch potable water pipeline, the project owner shall provide the CPM with a copy of an executed and final Potable Water Supply Agreement (agreement) for the long-term supply (30 – 35 years) of potable water. The agreement shall specify a minimum delivery rate of 602-gpm in order to meet ESPRP's operation requirements in the event of a recycled water interruption. The project owner shall not use more than 4-AFY of potable water as an emergency backup source for ESPRP operation.

Verification: No later than 30 days prior to completion of the 14-inch potable water pipeline, the project owner shall submit to the CPM two copies of the executed and final Potable Water Supply Agreement (agreement). The project owner shall submit to the CPM any water quality monitoring reports required by the City in the annual compliance report. The project owner shall notify the CPM of any violations of the agreement terms

~~and conditions, the actions taken or planned to bring the project back into compliance with the agreement, and the date compliance was reestablished.~~

~~**WATER RES-5:** The project owner shall use potable water supplied by the City of El Segundo (City) and recycled water supplied by the West Basin Municipal Water District (WBMWD) during ESPRP operation. Prior to the use of water from any source for ESPRP operation, the project owner shall install and maintain metering devices as part of the potable and recycled water supply and distribution systems. The metering devices shall be in operation for the life of the project. The project owner shall prepare an annual Water Use Summary that includes the monthly range and monthly average of daily potable and recycled water usage in gallons per day on a monthly basis and in acre-feet on an annual basis. For subsequent years, the annual Water Use Summary shall also include the yearly range and yearly average water use, by source, for the project. The annual Water Use Summary shall be submitted to the CPM as part of the annual compliance report.~~

~~**Verification:** At least 60 days prior to ESPRP commercial operation, the project owner shall submit to the CPM evidence that metering devices have been installed and are operational on the potable and recycled water supply and distribution systems. The project owner shall submit a Water Use Summary report to the CPM in the annual compliance report. The report shall disaggregate potable water supplied by the City and recycled water supplied by WBMWD for ESPRP industrial and landscape irrigation use. The project owner shall provide a report on the servicing, testing and calibration of the metering devices in the annual compliance report.~~

NPDES CONSTRUCTION PERMIT REQUIREMENTS

SOIL&WATER-1 The project owner shall manage stormwater pollution from ESPFM construction activities by fulfilling the requirements contained in State Water Resources Control Board's National Pollutant Discharge Elimination System (NPDES) General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities (Order No. 2009-0009-DWQ, NPDES No. CAS000002) and all subsequent revisions and amendments. The project owner shall develop and implement a construction Storm Water Pollution Prevention Plan (SWPPP) for the construction of the ESPFM project.

Verification: Thirty (30) days prior to site mobilization of ESPFM construction activities, the project owner shall submit the construction SWPPP to the Chief Building Official (CBO) and Compliance Project Manager (CPM) for review and the SWRCB for review and comment. A copy of the approved construction SWPPP shall be kept accessible onsite at all times. Within 10 days of its mailing or receipt, the project owner shall submit to the CPM any correspondence between the project owner and the Los Angeles Regional Water Quality Control Board about the general NPDES permit for discharge of stormwater associated with construction and land disturbance activities. This information shall include a copy of the notice of intent and the notice of termination submitted by the project owner to the SWRCB.

HYDROSTATIC WATER DISCHARGE PERMIT REQUIREMENTS

SOIL&WATER-2 Prior to initiation of hydrostatic testing water discharge to surface waters, the project owner shall obtain coverage under the National Pollutant Discharge Elimination System permit for discharge to the Pacific Ocean. The project owner shall comply with the requirements of the Permit Order No. R4-2009-0068, General NPDES Permit No. CAG674001 for hydrostatic testing water discharge. The project owner shall provide a copy of all permit documentation sent to the Los Angeles Regional Water Quality Control Board or State Water Resources Control Board to the CPM and notify the CPM in writing of any reported non-compliance.

Verification: Prior to construction mobilization, the project owner shall submit to the CPM documentation that all necessary NPDES permits were obtained from the Los Angeles Regional Water Quality Control Board or State Water Resources Control Board. Thirty (30) days prior to ESPFM operation, the project owner shall submit to the CPM a copy of the relevant plans and permits received. The project owner shall submit to the CPM all copies of any relevant correspondence between the project owner and the Board regarding NPDES permits in the annual compliance report.

NPDES INDUSTRIAL PERMIT REQUIREMENTS

SOIL&WATER-3 Prior to mobilization for construction, the project owner shall obtain coverage under a National Pollutant Discharge Elimination System permit for industrial waste and stormwater discharge to the Pacific Ocean. The project owner shall comply with the requirements of Order No. 00-084, NPDES No. CA0001147. The project owner shall provide a copy of all permit documentation sent to the Los Angeles Regional Water Quality Control Board or State Water Resources Control Board to the CPM and notify the CPM in writing of any reported non-compliance.

Verification: Prior to construction mobilization, the project owner shall submit to the CPM documentation that all necessary NPDES permits were obtained from the Los Angeles Regional Water Quality Control Board or State Water Resources Control Board. Thirty (30) days prior to ESPFM operation, the project owner shall submit to the CPM a copy of the Industrial SWPPP. The project owner shall submit to the CPM all copies of any relevant correspondence between the project owner and the Board regarding NPDES permits in the annual compliance report.

WATER AND SEWER CONNECTIONS

SOIL&WATER-4 The project owner shall pay the city of Manhattan Beach and the city of El Segundo all fees normally associated with industrial connections to the city's sanitary sewer system and water supply system, respectively, as defined in each city's code. City of Manhattan Beach Code, Chapter 5.36 – Sewers, Sewage Disposal; and City of El Segundo

Code, Title 11, Chapter 1 – Potable Water Supply, define the city's requirements for these connections.

Verification: Prior to the use of the city's water or sewer system the owner shall provide the CPM documentation indicating that the city has accepted the projects connections to the water and sewer systems. Fees paid to the city shall be reported in the Annual Compliance Report for the life of the project.

GROUNDWATER DISCHARGE PERMIT REQUIREMENTS

SOIL&WATER-5 Discharge of dewatering water shall comply with the Los Angeles Regional Water Quality Control Board (RWQCB) and State Water Resources Control Board regulatory requirements. The project owner shall submit a Report of Waste Discharge (RWD) to the Compliance Project Manager (CPM) and RWQCB for determination of which regulatory waiver or permit applies to the proposed discharges. The project owner shall pay all necessary fees for filing and review of the RWD and all other related fees. Checks for such fees shall be submitted to the RWQCB and shall be payable to the State Water Resources Control Board. The project owner shall ensure compliance with the provisions of the waiver or permit applicable to the discharge.

Where the regulatory requirements are not applied pursuant to a National Pollutant Discharge Elimination System permit, it is the Commission's intent that the requirements of the applicable waiver or permit be enforceable by both the Commission and the RWQCB. In furtherance of that objective, the Commission hereby delegates the enforcement of the waiver or permit requirements, and associated monitoring, inspection, and annual fee collection authority, to the RWQCB. Accordingly, the Commission and the RWQCB shall confer with each other and coordinate, as needed, in the enforcement of the requirements.

Verification: Prior to any dewatering water discharge, the project owner shall submit a RWD to the RWQCB to obtain the appropriate waiver or permit. The appropriate waiver or permit must be obtained at least 30 days prior to the discharge.

The project owner shall submit a copy of any correspondence between the project owner and the RWQCB regarding the waiver or permit and all related reports to the CPM within 10 days of correspondence receipt or submittal.

WATER USE AND REPORTING

SOIL&WATER-6 The water supply for project construction shall be recycled water from West Basin Municipal Water District (West Basin) and shall not exceed 23 AFY. The water supply for project operation shall be recycled water from West Basin and shall not exceed 137 AFY. Potable water use during operation shall be supplied by the city of El Segundo and use shall not exceed 4 AFY. In the event of a recycled water delivery interruption, potable water may be used as an emergency back-up supply for plant

construction and operation. For purposes of this condition, the term emergency shall mean the inability for the ESPFM to take, or for the West Basin to deliver, recycled water to the ESPFM in a quantity sufficient to meet demand due to natural disaster or other circumstances beyond the control of the project owner. A monthly summary of water use shall be submitted to the CPM.

Verification: The project owner shall record ESPFM operation water use on a daily basis and shall notify the CPM within 14 days upon forecast to exceed the maximum annual use as described above. Prior to exceeding the maximum use, the owner shall provide a plan to modify operations.

The project owner shall record ESPFM construction water use on a daily basis. The project owner shall notify the CPM within 2 days of when the recycled water supply for construction or operation is interrupted and indicate why recycled water could not be delivered, how much potable water was used, and how long potable water will be used prior to reestablishing the connection to the recycled water supply. The project owner shall develop a plan within 7 days to reestablish use of the recycled water supply The plan should include discussion of modification of construction practices may be modified and how excess water use may be offset The plan shall be submitted for CPM review and approval.

The project owner shall submit a water use summary report to the CPM monthly during construction and annually during operations for the life of the project. The annual report shall include calculated monthly range, monthly average, daily maximum within each month and annual use by the project in both gallons per minute and acre-feet. After the first year and for subsequent years, this information shall also include the yearly range and yearly average potable water used by the project.

WATER METER INSTALLATION

SOIL&WATER-7 Prior to the use of water from any source for operation, the project owner shall install and maintain metering devices as part of the potable and recycled water supply and distribution systems. The metering devices shall be in operation for the life of the project. The project owner shall prepare an annual Water Use Summary that includes the monthly range and monthly average of daily potable and recycled water usage in gallons per day on a monthly basis and in acre-feet on an annual basis. For subsequent years, the annual Water Use Summary shall also include the yearly range and yearly average water use, by source, for the project. The annual Water Use Summary shall be submitted to the CPM as part of the annual compliance report.

Verification: At least 60 days prior to commercial operation, the project owner shall submit to the CPM evidence that metering devices have been installed and are operational on the potable and recycled water supply and distribution systems. The project owner shall submit a Water Use Summary report to the CPM in the annual compliance report. The report shall disaggregate potable water supplied by the City and recycled water supplied by West Basin Municipal Water

District (West Basin) for ESPFM industrial and landscape irrigation use. The project owner shall provide a report on the servicing, testing and calibration of the metering devices in the annual compliance report.

RECYCLED WATER SUPPLY AGREEMENT

SOIL&WATER-8: The project owner shall provide the CPM a copy of the executed and final recycled water purchase agreement (agreement) with West Basin for the long-term supply (30-35 years) of tertiary treated recycled water for the project's industrial needs. The agreement shall specify a minimum delivery rate of 602-gpm. The agreement shall specify all terms and costs for the delivery and use of recycled water. The project shall not connect to West Basin's new 10-inch recycled water pipeline without the final agreement in place and submitted to the CPM. The project owner shall comply with the requirements of Title 22 and Title 17 of the California Code of Regulations.

Verification: No later than 60 days prior to the delivery of single pass reverse osmosis recycled water from the new 10-inch recycled water pipeline, the project owner shall submit two copies of the final and executed recycled water purchase agreement for the supply and on-site use of recycled water. The project owner shall submit to the CPM a copy of the cross connection inspection and approval report from the Los Angeles County Health Department prior to the delivery of recycled water from the new 10-inch recycled water pipeline.

POTABLE WATER SUPPLY AGREEMENT

SOIL&WATER-9 Prior to completion of the 14-inch potable water pipeline, the project owner shall provide the CPM with a copy of an executed and final Potable Water Supply Agreement (agreement) for the long-term supply (30–35 years) of potable water from the City of El Segundo (City). The agreement shall specify a minimum delivery rate of 602-gpm in order to meet ESPFM's operation requirements in the event of a recycled water interruption.

Verification: No later than 30 days prior to completion of the 14-inch potable water pipeline, the project owner shall submit to the CPM two copies of the executed and final Potable Water Supply Agreement (agreement). The project owner shall submit to the CPM any water quality monitoring reports required by the City in the annual compliance report. The project owner shall notify the CPM of any violations of the agreement terms and conditions, the actions taken or planned to bring the project back into compliance with the agreement, and the date compliance was reestablished.

REFERENCES

CEC 2005a- CEC (CEC-800-2005-001-CMF). El Segundo Power Redevelopment Project Commission Decision, dated 2/2005.

CEC 2009- The Impacts of Sea-Level Rise on the California Coast, Final Paper. California Energy Commission, Docket CEC-500-2009-024-.

CEC 2010a- CEC (CEC-800-2010-015). El Segundo Power Redevelopment Project Amendment Commission Decision, dated 6/2010.

CEC 2013a- CEC / C. Marxen (TN 70818). Notice of Receipt for the Petition to Amend, dated 5/14/2013. Submitted to CEC on 4/23/2013.

CGS 2009- California Geological Survey, Tsunami Inundation Maps. Venice Quadrangle, March 1, 2009.

ESPR 2000a- Application for Certification. Submitted to the California Energy Commission on December 18, 2000.

FEMA 2008- Flood Insurance Rate Map 06037C1770F, September 26, 2008. Accessed at https://msc.fema.gov, on October 29, 2013.

NAS 2012- Sea-Level Rise for the Coasts of California, Oregon, and Washington: Past, Present, and Future. National Academy of Sciences, Committee on Sea Level Rise in California, Oregon, and Washington. ISBN: 978-0-309-25594-3.

NRG 2013a- NRG / El Segundo Energy Center LLC (TN 70442) Petition to Amend, dated April 2013. Submitted to CEC on 04/23/2013.

NRG 2013b- NRG / El Segundo Energy Center LLC (TN 201000) ESPFM Operational Employees. Submitted to CEC on 10/23/2013.

OPC 2013- State of California Sea-Level Rise Guidance Document. Ocean Protection Council and the Coastal and Ocean Working Group of the California Climate Action Team. March 2013.

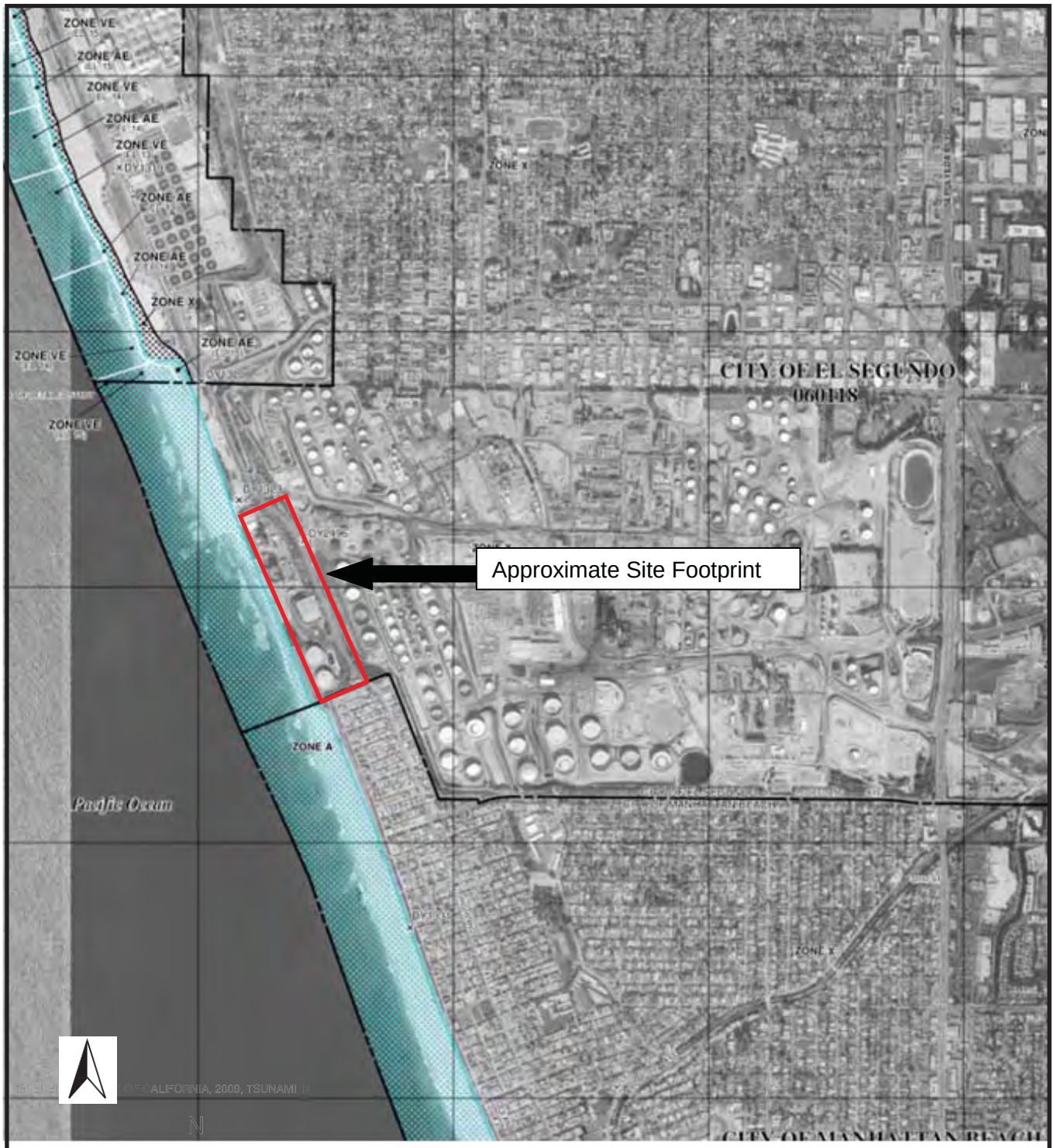
OWP 2013- California State University, Sacramento. Office of Water Programs, Division of Environmental Analysis Water Quality Planning Tool.

Tebaldi et al. 2012- Tebaldi, C., Strauss, B.H., and Zervas, C.E., 2012. Modelling sea level rise impacts on storm surges along US coasts. Environ. Res. Lett. 7 (2012) 014032 (11pp).

WC 1997- Phase II Environmental Assessment, Woodward-Clyde, 1997.

SOIL AND WATER - FIGURE 1

El Segundo Energy Center - FEMA FIRM for City of El Segundo, 06037C1770F, September 26, 2008 (FEMA, 2008)

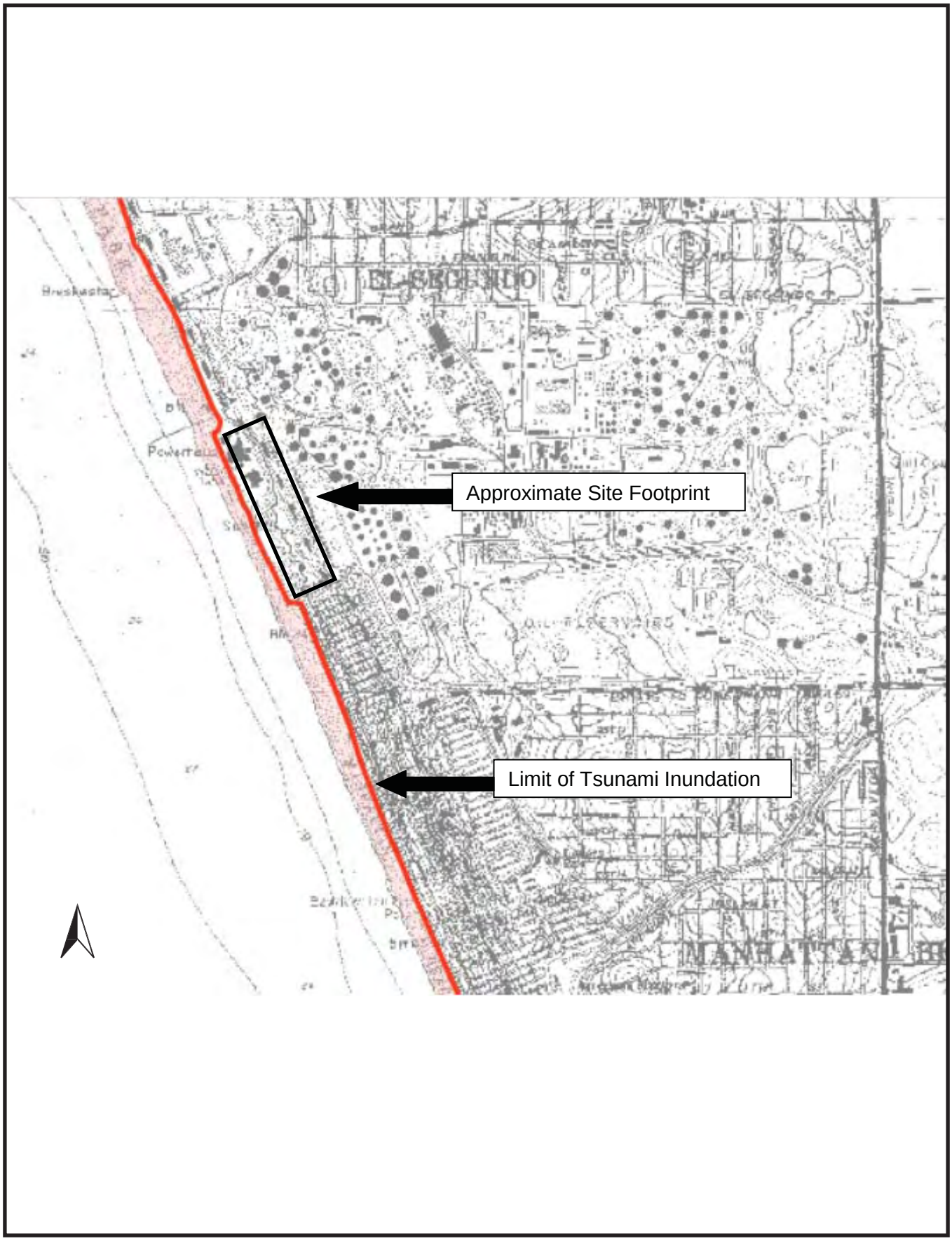


CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCE: FEMA FIRM for City of El Segundo, 06037C1770F, September 26, 2008 (FEMA, 2008)

SOIL AND WATER - FIGURE 2

El Segundo Energy Center - California Geological Survey, Tsunami Inundation Map, March 1, 2009 (CGS, 2009)



CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCE: California Geological Survey, Tsunami Inundation Map, March 1, 2009 (CGS, 2009)

TRANSMISSION LINE SAFETY AND NUISANCE

Testimony of Obed Odoemelam, Ph.D

SUMMARY OF CONCLUSIONS

The project owner, El Segundo Energy Center, LLC, (ESEC, LLC) proposes to modify the existing El Segundo Energy Center (ESEC) by replacing its utility boiler Units 3 and 4 with one combined-cycle generator (Unit 9), one new steam turbine generator (Unit 10), and two new simple-cycle gas turbines (Units 11 and 12). This would add 449 gross megawatts (MW) to the existing 573-MW generating capacity for a total of 1,022 gross MW. The amended project, to be also known as the El Segundo Power Facility Modification (ESPFM), would also replace the existing once-through seawater cooling system with dry-cooling technology. The generated power would be transmitted to users through the existing 230-kV Southern California Edison (SCE) transmission power grid approved by the California Energy Commission with regard to the safety and nuisance impacts discussed in staff's analysis for the approved ESEC. Three Transmission Line Safety and Nuisance Conditions of Certification were specified in this regard and have been listed at the end of this staff analysis. Since no new transmission towers or lines would need to be constructed or replaced within, or outside of, the site boundaries, the only changes to line impacts would be those from the additional 449 MW to be introduced into the existing system. The generated power would still be transmitted to the SCE 230-kV power grid through the currently utilized SCE switchyard within the fenced boundaries of ESEC. Staff recommends measurement of these incremental impacts for comparison with existing levels which staff regards as below the levels of health and safety concern.

INTRODUCTION

As presented in the **Project Description** section of this document, the proposed ESPFM is a modification of the existing ESEC owned by ESEC, LLC. This modification is intended to increase the amount of electric power presently generated while replacing the existing once-through seawater cooling system with dry-cooling technology. This modification would involve replacing the existing utility boiler Units 3 and 4 with one combined-cycle generator (Unit 9), one new steam turbine generator (Unit 10), and two new simple-cycle gas turbines (Units 11 and 12). This would add 449 gross MW to the existing 573 MW facility for a total of 1,022 gross MW. All the generated power would continue to be transmitted to the SCE 230-kV power grid by way of the presently utilized SCE 230-kV El Segundo Switchyard located adjacent to ESEC. There would be no changes to this existing transmission scheme.

Since the post-modification power would still be transmitted at the existing 230-kV level on the line, the system's electric fields will remain the same, meaning that all electric 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 would therefore, increase with the increased power generation.

The purpose of this analysis is to determine whether the use of the existing SCE transmission lines for the increased energy transmission at ESEC would allow for

continued compliance with existing laws, ordinances, regulations and standards (LORS) on the field and non-field impacts of concern in this analysis. Staff's analysis focuses 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 (LORS) COMPLIANCE

There would be no change in LORS as presented in the original analysis for the existing ESEC.

ANALYSIS

Since there would be no changes to the structure, design, and routing of the existing 230-kV transmission lines (to be utilized for the proposed ESPFM), the non-field impacts would remain the same for the existing ESEC and the proposed ESPFM. As discussed in staff's ESEC analysis, the most significant of the non-field impacts would relate to aviation safety and hazardous shocks from direct or indirect contact with the energized line. The most significant of the field-related impacts are those encountered as interference with radio-frequency communication, audible noise, nuisance shocks, and human electric and magnetic field (EMF) exposure. As previously noted, the electric fields and related impacts would remain the same from continued 230-kV line operation since the electric field depends on operating voltage. The only field component that directly depends on power generation and related current would be the magnetic field whose post-project levels will need to be measured to assess the contribution from the proposed 449 MW power increment.

In Condition of Certification **TLSN-2**, the Energy Commission required the project owner to measure the electric and magnetic fields from ESEC for comparison with pre-project levels and these data be used for the evaluation of the contribution from ESPFM. The measurements were required for the expected points of maximum impacts. The project owner complied with this requirement by providing the results of these post-project levels in a November 1, 2013, report to the Commission's Compliance Project Manager (CPM). The average value of the project-related magnetic field was 11.9 milligauss (mG) with a maximum of 12.3 mG. The maximum electric field level was recorded as 0.12 kilovolt per meter (kV/m). It is these existing levels that would be compared with the post-project levels recommended for measurement in Condition of Certification **TLSN-4** for the ESPFM.

CONCLUSIONS AND RECOMMENDATIONS

Staff concludes as follows from its analysis of the potential transmission line safety and nuisance impacts from operating the proposed ESPFM:

- Addition of 449 MW to the existing generating capacity would increase project-related magnetic fields by an amount to be assessed from requirements in Condition of Certification **TLSN-4** for specific measurements. The need for mitigation would depend on the level of this increment.
- Continued transmission at the existing 230 kV would not change the existing electric field and its noted impacts.
- Lack of changes to the design, routing or physical dimensions of the existing line to be used would ensure a lack of aviation impacts during ESPFM operations.

Staff would assess the post-ESPFM EMF levels for ESPFM compliance with existing safety and nuisance LORS of concern in this analysis. Staff has listed the three existing Transmission Line Safety and Nuisance Conditions of Certification (**TLSN-1**, **TLSN-2**, and **TLSN-**3, with a slight change to incorporate ESPFM) applicable to ESEC, together with the new Transmission Line Safety and Nuisance Condition of Certification (**TLSN-4**) recommended only for the proposed ESPFM. The new language is shown in **bold and underline**.

CONDITIONS OF CERTIFICATION FOR THE EXISTING EL SEGUNDO ENERGY CENTER

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 Commission's 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 fields 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.

TLSN-3: Thirty days prior to the start of commercial operations**,** the project owner shall send written notice to all property owners and residents in the City of Manhattan Beach within 1,000 feet of transmission lines **between the El Segundo Generating Station and the El Nido Substation** of the possible interference impacts associated with the project and procedures for reporting complaints. The project owner shall make every reasonable effort to identify and correct, on a case-specific basis, all complaints of interference with radio or television signals from operation of transmission lines and related facilities. In addition to any transmission repairs, the relevant corrective actions should include, but shall not be limited to, adjusting or modifying receivers, adjusting or repairing, replacing or adding antennas, antenna signal amplifiers, filters, or lead-in cable.

The project owner shall maintain written records for a period of five years, of all complaints of radio or television interference attributable to operation together with the corrective action taken in response to each compliant. All complaints shall be recorded to include notations on the corrective action taken. Complaints not leading to a specific action or for which there was no resolution should be noted and explained. The record shall be signed by the project owner and also the complaint, if possible, to indicate concurrence with the corrective action or agreement with the justification for a lack of action.

Verification: All reports of line-related complaints shall be summarized and included in the Annual Compliance Report to the CPM.

CONDITION OF CERTIFICATION RECOMMENDED FOR THE PROPOSED EL SEGUNDO POWER FACILITY MODIFICATION

Staff recommends the following new condition of certification for ESPFM:

TLSN-4: The project owner shall use a qualified individual to measure the strengths of the electric and magnetic fields from the ESPFM-related lines at the points of maximum intensity along the route for which the project owner provided their measured intensities for the previously approved ESEC. The measurements shall be made after energization according to the American National Standard Institute/Institute of Electrical and Electronic Engineers (ANSI/IEEE) standard procedures. These measurements shall be completed no later than six months after the start of operations.

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

REFERENCES

ESEC (El Segundo Energy Center) 2013. Petition to Amend. Final Commission Decision for the El Segundo Power Redevelopment Project (00-AFC-14C). Received on June 19, 2007.

ESEC 2013. Petition to Amend, El Segundo Energy Center (00-AFC-14C). April 2013.

ESEC 2013 (00-AFC-14C). Condition of Certification, TLSN-2. Transmission Line EMF Measurement Summary Report. Submitted to the Energy Commission Compliance Project Manager, November 1, 2013.

TRAFFIC AND TRANSPORTATION

Testimony of Jonathan Fong

SUMMARY OF CONCLUSIONS

Energy Commission staff has analyzed the information provided by the petitioner in the Petition to Amend (PTA) and acquired from other sources to determine the potential for the El Segundo Power Facility Modification (ESPFM, the project) to have significant adverse traffic and transportation-related impacts.

Staff concludes that the Conditions of Certification **TRANS-1** through **TRANS-9** will reduce traffic related impacts related to the project to a less than significant level. Staff also concludes that the project would comply with all applicable traffic laws, ordinances, regulations, and standards.

SOCIOECONOMICS Table 2 in the **Socioeconomics** section shows that the population within the six-mile buffer constitutes an environmental justice population as defined by *Environmental Justice: Guidance Under the National Environmental Policy Act*. Traffic and Transportation staff has concluded that upon implementation of the proposed conditions of certification, the project would not have any significant or disproportionate traffic impacts on any population, including an environmental justice population.

INTRODUCTION

In compliance with the California Environmental Quality Act (CEQA) and Energy Commission requirements, this analysis identifies the project's potential impacts to the surrounding transportation systems and proposed mitigation measures (conditions of certification) that would avoid or lessen these impacts. Staff has assessed the existing conditions of certification approved as part of the original El Segundo Energy Center (ESEC) licensing (00-AFC-14) and their potential for reducing impacts associated with the ESPFM to a less than significant level. Two new conditions of certification are proposed (**TRANS-8** and **TRANS-9**). The analysis also addresses the project's consistency with applicable federal, state, and local transportation-related laws, ordinances, regulations, and standards (LORS).

PETITIONER-PROPOSED MODIFICATIONS TO APPROVED CONDITIONS OF CERTIFICATION

The petitioner has not proposed any changes to the approved Conditions of Certification **TRANS-1** through **TRANS-7.** A summary of the approved conditions is included in the "Conclusions" subsection below.

STAFF-PROPOSED MODIFICATIONS TO APPROVED CONDITIONS OF CERTIFICATION

Staff has not proposed any modifications to the approved Conditions of Certification **TRANS-1** through **TRANS-7.**

As discussed in the "Operational Impacts and Mitigations" subsection below, the project has the potential to generate thermal plumes which may pose a hazard to aircraft in the project vicinity. Staff is proposing Condition of Certification **TRANS-8,** requiring notices be included on aviation sectional charts to avoid overflight of the site.

To reduce the potential of aviation hazards during project construction, staff is proposing Condition of Certification **TRANS-9,** which would require the project owner to install obstruction marking and lighting on all construction equipment which may pose an aviation hazard.

SETTING

The ESPFM site is located in the coastal zone of the city of El Segundo in western Los Angeles County. The area is largely built out with a range of residential, commercial and industrial land uses. See the **Land Use** section for a more thorough discussion of the surrounding land uses. The city of El Segundo roadway system is a predominantly grid network with roadways that connect north to I-105 (Imperial Highway) and east to I-405 (San Diego Freeway). See **Traffic and Transportation Figure 1** for a regional map of roadways and surrounding cities.

Construction workforce parking construction laydown areas would be provided on-site and at eight off-site areas. The parking areas are dispersed throughout the city and county of Los Angeles and the city of El Segundo. The proposed parking and laydown areas were previously approved as part of the previously permitted El Segundo Power Redevelopment Project (ESPRP) and are shown in **Traffic and Transportation Figure 4.** This figure also shows which areas will be used for construction workforce parking and for construction equipment laydown areas.

Construction of the project would require the delivery of large components by way of heavy/oversized trucks from a common rail depot at the Chevron refinery to the project site. The use of heavy/oversized trucks would be subject to the permitting requirements of the jurisdictions listed in the LORS table in **TRAFFIC AND TRANSPORTATION Table 1.** The roadways that would be affected by the proposed route are listed in **TRAFFIC AND TRANSPORTATION Table 2.**

Please refer to the **Project Description** section of this document for a detailed discussion of the existing power generating facilities on-site, project description and a description of the demolition and construction schedule.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS (LORS)

TRAFFIC AND TRANSPORTATION Table 1 provides a general description of adopted federal, state, and local LORS pertaining to traffic and transportation that apply to the project.

TRAFFIC AND TRANSPORTATION Table 1
Laws, Ordinances, Regulations, and Standards

Applicable Law	Description
Federal	
Title 49, Code of Federal Regulations, Parts 171-177	Requires proper handling and storage of hazardous materials during transportation.
Title 14, Code of Federal Regulations, Section 77.13 (2)(i)	This regulation requires notification of the Federal Aviation Administration (FAA) of construction structures with a height greater than 200 feet from grade or greater than an imaginary surface extending outward and upward at a slope of 100 to 1 for a horizontal distance of 20,000 feet from the nearest point of the nearest runway of an airport with at least one runway more than 3,200 feet in length.
State	
California Vehicle Code, Sections 13369, 15275, 15278	Requires licensing of drivers and the classification of license for the operation of particular types of vehicles. A commercial driver's license is required to operate commercial vehicles. An endorsement issued by the Department of Motor Vehicles (DMV) is required to drive any commercial vehicle identified in Section 15278.
California Vehicle Code, Sections 31303-31309	Requires transportation of hazardous materials to be on the state or interstate highway that offers the shortest overall transit time possible.
California Vehicle Code, Sections 31600-31620	Regulates the transportation of explosive materials.
California Vehicle Code, Sections 32100-32109	Requires shippers of inhalation hazards in bulk packaging to comply with rigorous equipment standards, inspection requirements, and route restrictions.
California Vehicle Code, Sections 34000-34100	Establishes special requirements for vehicles having a cargo tank and for hazardous waste transport vehicles and containers, as defined in Section 25167.4 of the Health and Safety Code.
California Vehicle Code, Section 35550-35551	Provides weight guidelines and restrictions vehicles traveling on freeways and highways.
California Vehicle Code, Section 35780	Requires a single-trip transportation permit to transport oversized or excessive loads over state highways.
California Streets and Highways Code, Sections 660, 670, 672, 1450, 1460, 1470, 1480 et seq., 1850-1852	Requires encroachment permits for projects involving excavation in state and county highways and city streets.
California Health and Safety Code, Section 25160	Addresses the safe transport of hazardous materials.
California Department of Transportation CA Manual of Uniform Traffic Control Devices (MUTCD) Part 6 (Traffic Manual)	Provides traffic control guidance and standards for continuity of function (movement of traffic, pedestrians, bicyclists, transit operations), and access to property/utilities when the normal function of a roadway is suspended.

Applicable Law	Description
Local	
City of El Segundo Circulation Element	The Circulation Element is a required chapter of the General Plan which evaluates the transportation needs of the city and provides a transportation plan to meet those needs.
Los Angeles County Regional Transportation Plan (RTP) Congestion Management Plan (CMP)	A required transportation planning document for urbanized areas with populations of 50,000. The CMP goals are to support regional mobility and air quality objectives by reducing traffic congestion.

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

METHODS AND THRESHOLDS FOR DETERMINING SIGNIFICANCE

Significance criteria used in this document for evaluating environmental impacts are based on the CEQA Guidelines, the CEQA Environmental Checklist for Transportation/Traffic, and applicable LORS used by other governmental agencies. Specifically, staff analyzed whether the proposed project would result in the following:

1. Cause an increase in traffic which is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume-to-capacity ratio on roads, or congestion at intersections);
2. Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit;
3. Conflict with an applicable congestion management program, including, but not limited to, level of service standards (LOS) and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways;
4. Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment);
5. Result in inadequate emergency access;
6. Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities;
7. Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risk;

8. Produce a thermal plume in an area where flight paths are expected to occur below 1,000 feet from the ground[40]; or
9. Have individual environmental effects which, when considered with other impacts from the same project or in conjunction with impacts from other closely related past, present, and reasonably foreseeable future projects, are considerable, compound, or increase other environmental impacts.

Critical Roads And Freeways

The city of El Segundo Circulation Element classifies roadways within the city limits as local streets, collector streets, major arterial or secondary arterials. These classifications are based on average daily traffic volumes and roadway design. The regional roadways are shown in **Traffic and Transportation Figure 1.** The local roadways within the city limits are shown in **Traffic and Transportation Figure 2**. The purpose of the classification of roadways is to evaluate the existing roadway network within the city and establish roadways for existing and future development to use. The following describes the local and regional roadways that would be used for construction and operational traffic accessing the proposed project site. All project related traffic would utilize adopted truck routes and would avoid all local streets. Below is a list of regional and local facilities that would likely be used as part of the project.

Existing Regional and Local Transportation Facilities

Interstate 405 (I-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, not including the auxiliary lanes. A High Occupancy Vehicle (HOV) lane is provided between Century Boulevard and Vermont Avenue.

Interstate 105 (I-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 provides three mixed flow lanes and one HOV lane in each direction, for a total of eight lanes. The Los Angeles County Metropolitan Transportation Authority (Metro) operates the Metro Green Line commuter rail service, located in the center median of the freeway. The Green Line's airport station is located at Aviation Boulevard.

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 one mile from the project site, and connects traffic from collector streets on the west side of El Segundo to the I-405 and the regional freeway system. The city of El Segundo General Plan identifies El

[40] The FAA recommends that pilots avoid overflight of plume-generating industrial sites below 1,000 feet AGL (FAA 2006).

Segundo Boulevard as truck route.

Grand Avenue is an east-west secondary arterial, four-lane undivided roadway from Vista Del Mar on the west to Sepulveda Boulevard. East of Sepulveda Boulevard, Grand Avenue is a six-lane divided roadway.

Imperial Highway is an east-west secondary arterial, four-lane divided roadway from Main Street on the west to Sepulveda Boulevard. East of Sepulveda Boulevard, Imperial Highway is a six-lane divided roadway.

Main Street is a north-south collector road, four-lane undivided roadway from north of Grand Avenue to El Segundo Boulevard.

Rosecrans Avenue is an east-west major arterial, five-lane divided roadway with three westbound lanes and two eastbound lanes from the westerly boundary of the city of Manhattan Beach to Sepulveda Boulevard. East of Sepulveda Boulevard, Rosecrans Avenue is a six-lane divided roadway. Rosecrans Avenue borders the southerly perimeter of the Chevron Refinery.

Sepulveda Boulevard is a north-south eight-lane divided major arterial providing connections to I-405 north of Los Angeles International Airport (LAX) via Howard Hughes Parkway, and to I-105 south of LAX. Sepulveda Boulevard provides access to communities north of LAX (such as Culver City and Westchester) as well as the South Bay communities. 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 north-south secondary arterial, four-lane undivided roadway, and is designated a truck route. Vista Del Mar bounds the easterly perimeter of the project site. Access to the site is via Vista Del Mar at the southerly end of the site.

Truck Route

Project demolition and construction would require truck deliveries and heavy/oversized deliveries for the transportation of equipment and machinery. Truck deliveries would occur in similar number and utilize the previously adopted truck route as part of the licensing of 00-AFC-14. Truck trips would be dispersed throughout the day beginning at 6:00am and continuing until 6:00pm. The maximum number of truck trips per month would be during Month 6 when 29 deliveries per day would be expected.

Heavy/oversized deliveries would arrive via rail at the common shipping depot located at the Chevron Refinery near the project site. These deliveries would occur for five months from Month 5 through 9. The peak deliveries would occur during Month 8 when 19 deliveries are expected to the project site.

A list of the potentially affected roadways for each of the parking lot locations is listed in **TRAFFIC AND TRANSPORTATION Table 2** listed below. Table 3.11-1 in the Petition to Amend (PTA) lists the potentially affected roadways based on the locations of off-site parking lots and laydown areas as well as expected travel routes to the project site. This

figure is included as **Traffic and Transportation Figure 3.** Construction workforce will be bused from the off-site parking areas to the project site. Due to the presence of existing military, aeronautical and other large scale industrial activities in the region, local agencies have experience routinely permitting oversize deliveries of comparable size and frequency as those proposed as part of project. The proposed route would follow adopted truck routes in the region and no significant impacts to existing levels of service (LOS) are anticipated. Staff is recommending implementation existing Condition of Certification **TRANS-3,** which requires the project owner to obtain all necessary transportation permits from affected jurisdictions for the transport of heavy/ oversized equipment associated with the project.

TRAFFIC AND TRANSPORTATION Table 2
Roadways Potentially Affected by Parking and Laydown Areas

Parking Lot	Roadway
Fed Ex Site(2)	Sepulveda Boulevard Aviation Boulevard Nash Street El Segundo Boulevard Mariposa Avenue Grand Avenue
LAX Pershing Site (3)	Vista Del Mar Pershing Drive Imperial Highway Rosencrans Avenue
County/ State Beaches (5-8)	Vista Del Mar Imperial Highway Rosencrans Avenue
W. 190th Street (10)	I-110/ I-405 interchange W. 190th Street Vista Del Mar

Level of Service (LOS)

To quantify the existing baseline traffic conditions, state highways, roadways, and intersections in the study area were analyzed in the Application for Certification (AFC) to determine their operating conditions. Based on the traffic volumes, the turning movement counts, and the existing number of lanes at each intersection, the volume/capacity (V/C) ratios and levels of service (LOS) have been determined for each intersection.

LOS is a qualitative measure describing operational conditions within a traffic stream. It is used to describe and quantify the congestion level on a particular roadway or intersection and generally describes these conditions in terms of such factors as speed or vehicle movement. **TRAFFIC AND TRANSPORTATION Table 3** summarizes roadway LOS for associated V/C ratios.

TRAFFIC AND TRANSPORTATION Table 3
Level of Service Criteria for Roadways and Intersections

Level of Service	Volume/Capacity (v/c)	Delay per Vehicle (seconds)	Description
A	≤10	≤ 10	Free flow; insignificant delays
B	>10 and ≤ 20	>10 and ≤ 20	Stable operation; minimal delays
C	>20 and ≤ 35	> 20 and ≤ 35	Stable operation; acceptable delays
D	>35 and ≤ 55	>35 and ≤ 55	Approaching unstable flow; queues develop rapidly but no excessive delays
E	>55 and ≤ 80	> 55 and ≤ 80	Unstable operation; significant delays
F	>80	> 80	Forced flow; jammed conditions

Current Roadway Segment Conditions — LOS

Level of service standards for the roadways and intersections in the vicinity of the ESPFM are established by and under the jurisdiction of two different agencies: the Los Angeles County Metro and the city of El Segundo. Staff used these LOS standards to evaluate potential ESPFM-generated traffic impacts. The following is a list of the applicable LOS standards:

- Los Angeles County Congestion Management Plan (CMP)

  The CMP, which is under the jurisdiction of Metro, establishes that the lowest acceptable performance standard for CMP intersections is LOS E. One CMP intersection would be potentially affected by the project located at Imperial Highway and El Segundo Boulevard.

- City of El Segundo Circulation Element

  The Circulation Element is a required chapter of the city General Plan which evaluates the long-term transportation needs of the city and provides a plan to accommodate those needs. The major Circulation Element Policy C3-1.1 establishes that the minimum acceptable LOS is LOS D. For intersections already operation at LOS E or LOS F, new development should not increase the volume/capacity ratio (V/C) 0.02 or 2 percent of the existing V/C.

OTHER TRANSPORTATION SYSTEMS

Commercial and Passenger Rail

Both commercial and passenger rail lines are located within the city limits of El Segundo. Burlington Northern- Santa Fe (BNSF) and Union Pacific railroads operate spur lines within the project vicinity. BNSF and Union Pacific rail lines may be used for transporting construction materials to the project site.

The Los Angeles County Metropolitan Transit Authority (Metro) operates passenger light rail services countywide. The Metro Green Line runs east-west connecting western beach communities including El Segundo to Los Angeles. Through the city limits, the Green Line runs predominately north south between South Sepulveda Boulevard and

South Aviation Boulevard and is nearly entirely built on above grade platforms and overcrossings.

Bus Service

Beach Cities Transit provides local bus service between the Los Angeles International Airport (LAX) through the beach communities of El Segundo, Manhattan Beach, Hermosa Beach, and Redondo Beach. A map showing the location of the nearby public transportation route and rail line is provided in **Traffic and Transportation Figure 5.**

The city of El Segundo operates a local "Lunchtime Ride" bus service which provides city wide bus service to downtown El Segundo and various business and points of interest within the city.

Bicycle and Pedestrian Facilities

The city of El Segundo provides a comprehensive network of Class I, II, or III (exclusive bike paths or trails, on-street striped lanes, shared ROW) bicycle lanes throughout the city. PCH includes Class II and Class I (off road, paved) bicycle lanes connecting the state and city beaches. Directly to the west of the site along the project site border with the beach is a dedicated bike trail which continues north to Playa del Rey and south to Redondo Beach. The project site abuts Vista del Mar which does not have dedicated or striped bicycle lanes, but does provide pedestrian sidewalks on the east side of the roadway.

Airports/ Helipads

The nearest public airport is LAX, which is approximately 1.5 miles northeast of the project site. There are three private rooftop helipads located in the Pacific Corporate Towers development approximately 1.75 miles west of the project site.

DIRECT/INDIRECT IMPACTS AND MITIGATION

The direct and indirect impacts of the proposed project on traffic and transportation system are discussed in this section and based on an analysis comparing existing conditions with construction and operational conditions. Staff evaluated the project impacts for two separate future scenarios: the peak construction month (when construction activity and employment would be maximized) and the first year of full operation. Roadway segments and intersections were selected for evaluation because they provide the most direct route to the project site and would most likely be affected by project traffic during project construction and operation.

Heavy/ Oversized Loads

As discussed above, the proposed heavy/ oversized load truck trips would occur outside of peak hours during the hours of 10 p.m. to 4 a.m. Oversized or overweight trucks with unlicensed drivers could present significant hazards to the general public and/or damage roadways. To ensure that the petitioner complies with weight, size, and route limitations set by the city of El Segundo, county of Los Angeles and Caltrans, staff recommends existing Condition of Certification **TRANS-1** to require the project owner to obtain roadway permits for vehicle sizes and weights, driver licensing, and truck routes.

Upon implementation of **TRANS-1,** the applicant would be required to adhere to all size and weight limitations for construction vehicles, therefore there would be less than significant impacts resulting from heavy/ oversized loads associated with the ESPFM.

Truck Traffic

The number of truck trips associated with the project is estimated to be similar to the number of trips expected as part of the original project licensing 00-AFC-14 and the subsequent amended project. The petitioner estimates a maximum of 29 monthly truck trips during Month 6 of the construction phase. Deliveries would be dispersed during the day from 6:00am to 6:00pm.

Standard sized and licensed trucks could damage roadways, creating significant public hazards; for this reason, staff has recommended existing Condition of Certification **TRANS-7**, which requires that the project owner repair and restore all roads damaged during construction activities. Based on the minimal increase in truck traffic associated with the proposed amendment and upon continued implementation of Conditions of Certification **TRANS-1** and **TRANS-7**, there would be no additional impacts from truck traffic.

Construction Traffic

The ESPFM demolition and construction period is anticipated to last 30 months. The peak construction period would be Months 17 through 23 where 500 works per day are expected (NRG 2013a).

Based on the traffic study prepared as part of the original project AFC and recent traffic studies conducted in the project vicinity, the following affected intersections are currently operating at LOS E or worse:

- Sepulveda Boulevard/ Imperial Highway
- Sepulveda Boulevard/ Grand Avenue
- Sepulveda Boulevard/ El Segundo Boulevard
- Sepulveda Boulevard/ Rosencrans Avenue
- Aviation Boulevard/ El Segundo Boulevard
- Aviation Boulevard/ Rosencrans Boulevard

The petitioner has indicated that the preferred off-site parking area would be located at 777 W. 190th Street in the city of Gardena (NRG 2013a). This site is listed as Parking Area 10 (190th Street) in **Traffic and Transportation Figure 4.** The site is approximately 12 acres in size and is equipped with perimeter fencing and night lighting. Access from this site to the project site would occur via I-405 and I-110 to Imperial Highway. Imperial Highway terminates at Vista del Mar which provides direct access to the project site. Using this as the preferred construction workforce parking area would minimize the impacts to local roadways and would not increase the vehicle/ capacity ratio by 2 percent and would therefore be consistent with the city of El Segundo LORS.

To avoid worsening the LOS at these intersections, staff is recommending existing Condition of Certification **TRANS-4,** which requires the project owner to implement a

parking and staging plan and Condition of Certification **TRANS-5,** which requires a traffic control plan (TCP). The TCP requires the project owner to monitor affected intersections and provide alternate routes and if necessary avoid the existing failing intersections. The applicant would be required to maintain flag persons along Vista Del Mar to address any temporary lane closures and redirect traffic to reduce potential impacts during project construction. Upon implementation of the parking and staging plan and the TCP, temporary construction traffic would be less than significant.

Linear Facilities

The ESPFM would utilize a site already developed with an electrical generating facility. No new off-site linears would be required that will affect the transportation roadway system in the project area. There would be no traffic impacts associated with the construction of off-site linears as part of the project.

Transportation of Hazardous Materials and Waste

The project would involve hazardous materials deliveries in similar quantity and frequency as the existing ESEC. The project owner would continue to deliver hazardous waste along adopted truck routes and maintain all necessary permits in accordance with Condition of Certification **TRANS-3.** Please refer to the **Hazardous Materials Management** section of this document for a detailed description of hazardous waste associated with the project and proposed conditions of certification for the ESPFM.

Aviation Impacts

The ESPFM site is approximately 1.5 miles south of the Los Angeles International Airport (LAX). There would be no aviation impacts anticipated as part of the construction of ESPFM. Title 14, Part 77 of the Code of Federal Regulations requires FAA notification for any proposed construction feature that would be 200 feet or taller above ground level or penetrate the 100:1 imaginary horizontal plane from the nearest LAX runway. During project construction, cranes or other tall construction equipment may be used which pose a hazard to aviation in the project area. For project compliance with FAA regulations, staff is proposing Condition of Certification **TRANS-9**, which would require the project owner to install and maintain obstruction marking and lighting on all equipment that would exceed height thresholds in accordance with FAA standards.

ESPFM Construction Impacts Conclusion

With implementation of the existing and proposed conditions of certification discussed in this analysis, construction of the ESPFM would result in less than significant impacts to the traffic and transportation system in the project vicinity.

Operational Impacts and Mitigation

Workforce Traffic

The ESPFM would not increase the number of workers on-site. Currently there are 50 operational employees at the plant. Following construction of the proposed Units 9, 10, 11 and 12 the facility would continue to employ 50 employees (NRG 2013b). There would be no impact from operational workforce as part of the amendment.

Truck Traffic and Hazardous Materials Delivery

The ESPFM would discontinue the use of once-through-cooling as part of facility operations. The removal of this project component would eliminate the need for on-site chlorine for biological growth control. Also, the more efficient turbines would reduce the number of aqueous ammonia truck trips to the project site. Other hazardous materials deliveries and truck traffic would occur in similar numbers as presently occurring. Continued conformance with adopted Conditions of Certification **TRANS-3** and **TRANS-6** would ensure deliveries occur along adopted truck routes and the project owner would obtain all necessary permits for the delivery of hazardous materials to the site. No new impacts related to truck traffic and hazardous materials are anticipated. The handling of hazardous substances is also discussed in the **Waste Management, Worker Safety and Fire Protection,** and **Hazardous Materials Management** sections of this document.

Parking

The ESPFM would not increase the number of workers needed on-site. All operational workforce parking would be provided on-site. As shown in Figure 2-3a "Grading Plan-Key Plan" included in the PTA, workforce parking would be provided on the graded and paved area where the oil tanks have since been removed. No impacts to parking are anticipated as part of the amendment. For more information about LORS related to parking, see the **Land Use** section of this document for a discussion of parking requirements.

Emergency Access

Energy Commission staff does not anticipate emergency access issues associated with the proposed amendment. The proposed amendment would not alter the existing primary access from Vista del Mar and would not alter the secondary gated emergency access through the Chevron facility north of the site.

Airport Operations and Hazards

Title 14, Part 77 of the Code of Federal Regulations requires FAA notification for any proposed structure that would be 200 feet or taller above ground level (AGL) or that would extend beyond the 100:1 imaginary slope from the nearest point of the nearest airport runway. The nearest airport is LAX which is approximately 1.5 miles from the site. The petitioner proposes three new 210 foot tall stacks for Units 5 through 10 and two new 150 foot tall stacks for Units 11 and 12. The new stacks would exceed the 100:1 imaginary slope and may pose a hazard to LAX flight activities and small private aircraft in the area. Existing Condition of Certification TRANS-6 requires the project owner to submit the required Form 7460-1, Notice of Proposed Construction or Alteration to the FAA and comply with the appropriate lighting and marking requirements for the new stacks.

Upon compliance with the recommended FAA marking and lighting requirements, there will be no significant impacts to airport operations.

Thermal Plumes

The project would include gas turbines and dry cooling towers which have the potential to generate thermal plumes during worst case conditions. These conditions would be full plant operation during periods of calm or very low wind speeds and cool temperatures. High velocity thermal plumes have the potential to affect aviation safety and the FAA has amended the Aeronautical Information Publication to establish thermal plumes as flight hazards. Aircraft flying through thermal plumes may experience significant air disturbances, such as turbulence and vertical shear. Due to the close proximity with LAX there is a potential for low flying aircraft to be affected by the thermal plumes.

Energy Commission staff uses a 4.3 meters per second (m/s) vertical velocity threshold for determining whether a plume may pose a hazard to aircraft. This velocity generally defines the point at which general aviation aircraft begin to experience more than light turbulence. Exhaust plumes with high vertical velocities may damage aircraft airframes or cause turbulence resulting in loss of aircraft control and maneuverability (FAA 2006).

The plume velocity analysis conducted by staff concludes that the plumes generated by the project would exceed 4.3 m/s between 870 feet and 2,020 feet above ground level (AGL) under worst case conditions. This would generate a potential impact to aircraft if they were to fly over at low altitude. Therefore, staff has proposed Condition of Certification TRANS-8 which would require notification in accordance with FAA requirements to advise pilots of the potential overflight hazard associated with thermal plumes generated by the project and the need to avoid overflight below 2,020 feet AGL. Notification requirements may include issuance of a Notice to Airmen (NOTAM), revision to local sectional charts, and addition of a new remark to the Automated Surface Observing System (ASOS). Upon implementation of TRANS-8 the potential impacts to aviation would be less than significant. Based on the small number of aircraft and helicopters likely to fly over the project and the presence of available flight paths to avoid the thermal plumes, pilots would have the ability to safely avoid the thermal plumes. See Appendix TT-1 for detailed results of staff's plume velocity analysis for the project.

ESPFM OPERATION IMPACTS CONCLUSION

With continued implementation of the approved conditions of certification and the addition of Condition of Certification **TRANS-8** as discussed above, impacts to ground and air transportation from the operation of the project would be less than significant.

Cumulative Traffic Impacts

A project may result in a significant adverse cumulative impact when its effects are cumulatively considerable. Cumulatively considerable means that the incremental effects of an individual project are significant when viewed in connection with the effects of (1) past projects; (2) other current projects; and (3) probable future projects (California Code of Regulations, Title 14, Section 15130).

To analyze the cumulative effect of the project with reasonably foreseeable projects, Section 15130(b) of the CEQA Guidelines allows a lead agency to analyze cumulative impacts by either:

(A) A list of past, present, and probable future projects producing related or cumulative impacts, including, if necessary, those projects outside the control of the agency, or

(B) A summary of projections contained in an adopted local, regional or statewide plan, or related planning document, that describes or evaluates conditions contributing to the cumulative effect.

Staff reviewed known past, current, and probable future projects in the vicinity of the proposed project, which staff defined as the city of El Segundo, and the portion of Los Angeles County bounded south by I-105, west by I-405, and north of the city of Manhattan Beach. Trips generated by these projects occur within the transportation network affected by the project and may have cumulative impacts to the level-of-service (LOS) of nearby highways, roadways, and intersections. These roadways are identified in **Traffic and Transportation Figure 2.** The cumulative projects are listed in **TRAFFIC AND TRANSPORTATION Table 4** below.

The projects listed in the cumulative list below have been taken from a master list compiled by staff. The projects that have been excluded from consideration are either not located within the geographic area identified for the traffic and transportation analysis or do not include construction traffic that would combine with ESPFM-related traffic.

As discussed above, staff has determined that upon implementation of the recommended Conditions of Certification **TRANS-1** through **TRANS-9**, all traffic related direct impacts would be less than significant. All direct impacts with ESPFM have been mitigated and the project's incremental effects would not be cumulatively considerable.

TRAFFIC AND TRANSPORTATION Table 4
Development Considered in the Cumulative Condition

Label ID	Status	Project Name	Project Description	Location	Distance (Miles)
1	**Completed/ Past**	El Segundo	Redevelopment of power plant Units 1 and 2.	301 Vista Del Mar, El Segundo	0.19
2	**Completed/ Past**	Chevron Coke Drum Project	Removal of six existing coke drums and installation of six new coke drums with the same capacity and location in the Delayed Coker Unit.	324 West El Segundo Blvd., El Segundo	0.49
3	**Planned/ Present**	EA-974	Central Reliability Center, central tool room. New: 101,000 sq. ft.; existing to remain: 13,000 sq. ft.; new total is 114,000 sq. ft.	324 West El Segundo Blvd., El Segundo	0.58
4	**Foreseeable**	Scattergood Generating Station	The Los Angeles Dept. of Water and Power would construct four power-generating units at the Scattergood Generating Station. Some structures would be demolished and two full size units on the lower level and two smaller units on the middle level of the plant would be constructed. The project work force will utilize on-site parking.	12700 Vista Del Mar, Los Angeles	0.72
7	**Planned/ Present**	EA-1004	Two new creative office and research and development buildings. 1,297 sq. ft. office, 7,803 sq. ft. research and development, 1,194 sq. ft. warehouse, total 10,294 sq. ft.	134 Penn St., El Segundo	1.00
8	**Planned/ Present**	EA-1003	Two new creative office and research and development buildings. 1,297 sq. ft. office, 7,803 sq. ft. research and development, 1,194 sq. ft. warehouse, total 10,294 sq. ft	130 Penn St., El Segundo	1.01
12	**Planned/ Present**	EA-959	Two office buildings; 30,660 sq. ft.	222 Kansas St. El Segundo	1.54
13	**Foreseeable**	EA-993, The Point	119,275 sq. ft. total. Shopping center (71,343 sq. ft.), restaurant (25,627 sq. ft.), and office (27,338 sq. ft.).	820-850 S. Sepulveda Blvd., El Segundo	1.60
14	**Foreseeable**	Civic Center/Metlox Development	Demolition and reconstruction of the existing police and fire department facilities to include a two-level (one level below grade), approx. 57,000 sq. ft. combined police and fire dept. public safety facility. The existing public library would be reconstructed by either adding on to the existing 12,100 sq. ft. public library or	Site boundaries: 15th St. on north, Valley Dr. on east, Manhattan Beach	1.67

Label ID	Status	Project Name	Project Description	Location	Distance (Miles)
			demolished and reconstructed with a new public library and cultural arts center for an approx. 40,000 sq. ft. structure with roughly 30,000 sq. ft. for library space and 10,000 sq. ft. for a 99-seat cultural arts center. The Metlox project consists of a mixed-use commercial development with subterranean parking, incl. some above-grade surface parking on the proposed 13th Street extension. The total floor area proposed is approx. 90,000 sq. ft. comprised of retail, restaurant, a 40-room bed and breakfast lodging component, and office uses.	Blvd. on south, and Highland Ave. and Morningside Dr. on west; Manhattan Beach	
15	**Planned**	EA-890, El Segundo Unified School District	304 Senior housing/assisted living facility up to 175,000 sq. ft.	540 E. Imperial Ave., El Segundo	1.72
18	**Planned**	EA-912	New 3,714 sq. ft. restaurant with drive through; parking and landscaping redesign; outdoor dining	600 - 630 North Sepulveda Blvd., El Segundo	1.93
19	**Planned**	Cambria Suites, EA-844	152 room hotel – 71,000 sq. ft.	199 Continental Blvd., El Segundo	1.99
20	**Foreseeable**	EA-905, Raytheon Campus Specific Plan	Approx. 2.1 million (2,142,457) square-foot Office Park Expansion (office, retail, warehouse, light industrial).	2100 El Segundo Boulevard, El Segundo	2.00
21	**Foreseeable**	EA-986, Mattel	R&D and office, 14 stories, 300,000 sq. ft., 810-space parking structure-8-stories	455 Continental Blvd. and 19055 E. Grand Ave., El Segundo	2.00
22	**Planned/ Present**	EA-981	Office, 194,119 sq. ft.	1700 East Imperial Ave., El Segundo	2.07
23	**Foreseeable**	EA-997, Hotel	5-story, 190 room hotel, 107,090 sq. ft.	888 North Sepulveda, El Segundo	2.13
25	**Planned/ Present**	Central Utility Plant Replacement	Replace the 50-year old existing Central Utility Plant (CUP) with a more modern and energy efficient facility	LAX, Los Angeles	2.22

Label ID	Status	Project Name	Project Description	Location	Distance (Miles)
	Planned/ Present	New Tom Bradley International Terminal	18 new gates to the west side of the Tom Bradley International Terminal, great hall for dining and retail shopping.		
	Planned/ Present	Elevator, Escalator, and Moving Walkway Modernization	Refurbish 212 outdated systems with new, modern units throughout the airport; new escalators, elevators, and walkways		
	Planned/ Present	Terminal 5 Renovation	Completed new in-line baggage screening system, expansion of passenger screening check points, and international passenger processing facilities. Renovate baggage claim areas, ticketing/check-in lobby, boarding gates, and other parts of passenger security screening area. Replace 13 bridges.		
	Planned/ Present	LAX Curbside Appeal Project	Phase 1: New Canopy, landscaping, light band, and new light poles in front of Tom Bradley International Terminal; Phase 2: Light band, light poles, and canopies in front of the terminal in the LAX Central Terminal Area		
	Planned/ Present	Runway Status Lights	With completion of the installation of the prototype runway status lights in 2009, the full system will be installed. Runway status lights use a series of red lights embedded in the pavement to warn pilots if it is unsafe to cross or enter a runway, or to take off.		
26	**Planned/ Present**	EA-971	Data Center, addition of 75,435 sq. ft., demo of 11,769 sq. ft. out of existing for new total sq. ft. of 180,422.	444 N Nash St., El Segundo	2.33
27	**Foreseeable**	West Aircraft Maintenance Area	Replace existing facilities and consolidate maintenance operations; paved area for aircraft parking, maintenance hangars, 300-space employee parking lot, storage, equipment related facilities, and ground run-up enclosure.	LAX, Los Angeles	2.35
	Foreseeable	Midfield Satellite Concourse North	Phase 1 of the MSC Program (northern portion of the MSC facility and associated improvements). Project components include a concourse for up to 11 gates and assoc. facilities; improvements to taxiways and taxilanes; ramp tower or FAA supplemental airport traffic control tower; and utilities to support the North MSC facility.		

Label ID	Status	Project Name	Project Description	Location	Distance (Miles)
	Foreseeable	LAX Runway 7L/25R Runway Safety Area (RSA) Project & Associated Improvements	1) Extend Runway 7L/25R pavement; grade and compact the RSA; construct blast pad west of Runway 7L extension; several taxiways modifications as necessary; relocate existing Localizer Antenna and shelter to the west; replace existing Approach Lighting System (ALS) towers with in-pavement lights; and modify existing Runway and Taxiway lighting and markings in newly constructed pavements; 2) Reconstruct pavement of eastern portions of Runway 7L/25R and Taxiway B including connecting taxiways and installation of in-pavement approach lights; 3) Reconstruct pavement of aircraft parking apron west of Air Freight Building No. 8, including new markings.		
	Foreseeable	LAX Runway 6L-24R Safety Area & Associated Improvements	Improve Runway 6L-24R and service roads to bring runway into compliance with applicable FAA design criteria.		
28	**Planned/ Present**	Wiseburn High School	New high school, 180,000 to 240,000 sq. ft.	201 North Douglas, El Segundo	2.37
29	**Foreseeable**	EA-1021	625,205 sq. ft. total; 611,545 sq. ft. office, 12,660 sq. ft. retail	710 North Nash St., El Segundo	2.38
30	**Foreseeable**	EA-1040	28,406 sq. ft. office, 33,475 sq. ft. light industrial, total 61,881 sq. ft.	400 Duley Rd. El Segundo	2.45
31	**Planned/ Present**	EA-784	Data Center, 332,137 sq. ft.	445 N Douglas Street, El Segundo	2.45
32	**Planned/ Present**	EA-1001	Creative office. 2355 Utah: Convert existing 42,548 sq. ft. to all office, add 1687 sq. ft. 2383 Utah: Convert existing 152,506 sq. ft. to all office, add 6850 sq. ft.	2355 Utah and 2383 Utah Ave., El Segundo	2.53
35	**Foreseeable**	Redondo Beach Energy Project	Natural gas fired air-cooled 496-megawatt electrical generating facility. Project would require demolition of existing power plant and construction of project.	Redondo Beach Generating Station site, Redondo Beach	4.30

COMPLIANCE WITH LORS

TRAFFIC AND TRANSPORTATION Table 5 provides an assessment of the project compliance with applicable laws, ordinances, and regulations (LORS) pertaining to traffic and transportation.

TRAFFIC AND TRANSPORTATION Table 5
Project Compliance with Adopted Traffic and Transportation LORS

Applicable Law	Description	Consistency
Federal		
Title 49, Code of Federal Regulations, Parts 171-177	Requires proper handling and storage of hazardous materials during transportation.	**Consistent.** The project owner would conform to this law by requiring shippers of hazardous materials to use the required markings on their transportation vehicles. Also, **TRANS-3** ensures compliance by requiring the project owner to contract with licensed hazardous material and waste hauler companies.
Title 14, Code of Federal Regulations, Section 77.13 (2)(i)	This regulation requires the project owner to notify the Federal Aviation Administration (FAA) of construction structures with a height greater than 200 feet from grade or greater than an imaginary surface extending outward and upward at a slope of 100 to 1 from the nearest point of the nearest runway of an airport with at least one runway more than 3,200 feet in length.	**Consistent.** The project may include structures that would exceed the 100:1 slope threshold of an operating airport. **TRANS-6** would require the project owner submit applications to the FAA and comply with all marking and lighting requirements.
State		
California Vehicle Code, Sections 13369, 15275, 15278	Requires licensing of drivers and the classification of license for the operation of particular types of vehicles. A commercial driver's license is required to operate commercial vehicles. An endorsement issued by the Department of Motor Vehicles (DMV) is required to drive any commercial vehicle identified in Section 15278.	**Consistent.** The project owner would require that contractors and employers be properly licensed and endorsed when operating such vehicles. **TRANS-1**, which requires proper driver licensing, ensures compliance.
California Vehicle Code, Sections 31303-31309	Requires transportation of hazardous materials to be on the state or interstate route that offers the shortest overall transit time possible.	**Consistent.** The project owner would require shippers of hazardous materials to use the shortest route possible to and from the project site. The proposed routes are consistent with this requirement. Also, **TRANS-3** (see above for explanation) ensures compliance.
California Vehicle Code, Sections 31600-31620	Regulates the transportation of explosive materials.	**Consistent.** The project would not use explosive

Applicable Law	Description	Consistency
		materials as defined in Section 12000 of the Health and Safety Code.
California Vehicle Code, Sections 32100-32109	Requires shippers of inhalation hazards in bulk packaging comply with rigorous equipment standards, inspection requirements, and route restrictions.	**Consistent.** The project owner would require shippers of inhalation hazards (including ammonia) to comply with all route restrictions, equipment standards, and inspection requirements. Also, **TRANS-3** (see above for explanation) requires compliance.
California Vehicle Code, Sections 34000-34100	Establishes special requirements for vehicles having a cargo tank and for hazardous waste transport vehicles and containers, as defined in Section 25167.4 of the Health and Safety Code.	**Consistent.** The project owner would require shippers of hazardous materials to maintain their hazardous material transport vehicles in a manner that would enable the vehicles to pass California Highway Patrol inspections. Also, **TRANS-3** (see above for explanation) requires compliance.
California Vehicle Code, Section 35550	Regulates weight guidelines and restrictions upon vehicles traveling on freeways and highways. A single axle load shall not exceed 20,000 pounds, the load on any one wheel or wheels supporting one end of an axle is limited to 10,500 pounds, and the front steering axle load is limited to 12,500 pounds.	**Consistent.** The project owner would ensure compliance with weight restrictions and would require heavy haulers to obtain necessary permits prior to delivery of any heavy haul load. Also, **TRANS-1** (which requires the project owner to comply with limitations on vehicle sizes and weights, driver licensing, and truck routes) requires compliance.
California Vehicle Code, Section 35551	Defines the maximum overall gross weight as 80,000 pounds and mandates that the gross weight of each set of tandem axles not exceed 34,000 pounds.	**Consistent.** The project owner would require compliance with weight restrictions and would require heavy haulers to obtain necessary permits prior to delivery of any heavy haul load. Also, **TRANS-1** (see above for explanation) requires compliance.
California Vehicle Code, Section 35780	Requires a single-trip transportation permit to transport oversized or excessive loads over state highways.	**Consistent.** The project owner would comply with this code by requiring that heavy haulers obtain a Single-Trip Transportation Permit for oversized loads. Also, **TRANS-1** (see above for explanation) requires compliance.
California Streets and Highways Code, Sections 660, 670, 672, 1450, 1460, 1470, 1480 et seq., 1850-1852	Requires encroachment permits for projects involving excavation in state and county highways and city streets.	**Consistent.** The project owner would comply by acquiring the necessary permits and approval from Caltrans, the City of El Segundo and county of Los Angeles with regard to encroachment into public rights-of-way, as required by **TRANS-2**.

Applicable Law	Description	Consistency
California Health and Safety Code, Section 25160	Addresses the safe transport of hazardous materials	**Consistent.** **TRANS-3** would require the project owner would comply by requiring that shippers of hazardous wastes are properly licensed by the Department of Toxic Substances Control (DTSC), and that hazardous waste transport vehicles are in compliance with DTSC requirements.
California Department of Transportation CA MUTCD Part 6 (Traffic Manual)	Provides traffic control guidance and standards for continuity of function (movement of traffic, pedestrians, bicyclists, transit operations), and access to property/utilities when the normal function of a roadway is suspended.	**Consistent.** The project owner has already prepared a Traffic Control Plan (TCP) as part original project licensing. **TRANS-5** would require that the project owner continue to implement the traffic control measures approved in the TCP.
Local		
City of El Segundo General Plan, Chapter III Circulation Element	Policy C3-1.2 Requires development projects to provide associated road improvements necessary to achieve a level of service of "D" at all intersections except for those intersections identified in the General Plan as already operating below LOS D during peak hours. Impacts to already failing intersections are considered significant if development increases the Volume/Capacity (V.C) ratio 0.02 or greater.	**Consistent.** The additional trips generated by the project would not reduce the LOS at affected intersections. **TRANS-5** would require the project owner prepare a Traffic Control Plan would assess the need for alternate workforce arrival times outside of peak hours. The TCP would ensure the LOS of the affected intersections would not fall below allowable thresholds.
Los Angeles County Code, Title 16- Highways, Chapter 16.22 Moving Permits, 16.22.030 Moving Permit issuance conditions for overweight loads.	Requires an oversize vehicle permit issued by the director of public works for operation of vehicles that exceed weight or measurement requirements of the Vehicle Code within Los Angeles County.	**Consistent.** **TRANS-1** would require the project owner obtain all necessary permits for heavy/oversize loads.

NOTEWORTHY PUBLIC BENEFITS

Staff has not identified any traffic-related benefits associated with the proposed ESPFM project.

RESPONSE TO AGENCY AND PUBLIC COMMENTS

Staff has not received any comments related to Traffic and Transportation issues following the publication of the Preliminary Staff Assessment.

CONCLUSIONS

Staff has analyzed the proposed ESPFM's impacts to the nearby traffic and transportation system. With implementation of the adopted conditions of certification

listed below, the ESPFM would comply with all applicable LORS related to traffic and transportation and would result in less than significant impacts to the traffic and transportation system.

1. Implementation of Condition of Certification **TRANS-1** would require the project owner to comply with applicable jurisdictions' requirements of vehicle size and weights, vehicle licensing, truck routes and other applicable limitations. The project owner would also be required to obtain all necessary transportation permits for roadway use.

2. Implementation of Condition of Certification **TRANS-2** would require the project owner to obtain all necessary encroachment permits through Caltrans, the city of El Segundo or other applicable jurisdiction.

3. Implementation of Condition of Certification **TRANS-3** would require the project owner to obtain all necessary permits from the California Highway Patrol and Caltrans for the transportation of hazardous materials.

4. Implementation of Condition of Certification **TRANS-4** would require the project owner to prepare and implement a parking and staging plan to ensure that all construction related equipment staging and parking occur in designated on-site and off-site parking areas.

5. Implementation of Condition of Certification **TRANS-5** would require the project owner to prepare and implement a traffic control plan (TCP) that would ensure sufficient parking during project construction and operation. The TCP would require that the project owner to address timing of equipment deliveries, arrival timing of employees, travel lane closures and maintain adequate emergency access for the duration of project construction and operation.

6. Implementation of Condition of Certification **TRANS-6** would require the project owner to implement all necessary obstruction marking and lighting in accordance with FAA requirements.
7. Implementation of Condition of Certification **TRANS-7** would require the project project owner to restore any road, easement or right-of-way damaged by project construction.

8. Implementation of Condition of Certification **TRANS-8** would require the project owner to advise pilots of the potential aviation hazards associated with thermal plumes and to avoid overflight of the facility below 2,020 feet.

9. Implementation of Condition of Certification **TRANS-9** would require the project owner to install obstruction marking and lighting on all construction equipment which may pose an aviation hazard during project construction.

PROPOSED CONDITIONS OF CERTIFICATION

(Note: New text is shown in **bold and underline**.)

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 of 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.

TRANS-8 Pilot Notification and Awareness The project owner shall initiate the following actions to ensure pilots are aware of the project location and potential hazards to aviation:

- **Submit a letter to the FAA requesting a Notice to Airmen (NOTAM) be issued advising pilots of the location of the ESEC and recommending avoidance of overflight of the project site below 2,020 feet above grade level (AGL). The letter should also request that the NOTAM be maintained in active status until all navigational charts and Airport Facility Directories (AFDs) have been updated.**
- **Submit a letter to the FAA requesting a power plant depiction symbol be placed at the ESEC site location on the Los Angeles Sectional Chart with a notice to "avoid overflight below 2,020 feet AGL".**
- **Request that Southern California TRACON submit aerodrome remarks describing the location of the ESEC and advising against direct overflight below 2,020 feet AGL to the:**
- **FAA AeroNav Services, formerly the FAA National Aeronautical Charting Office (Airport/Facility Directory)**
- **Jeppesen Sanderson Inc. (JeppGuide Airport Directory, Western Region)**
- **Airguide Publications (Flight Guide, Western States)**

Verification: Within 30 days following the start of construction, the project owner shall submit draft language for the letters of request to the FAA (including Southern California TRACON) to the CPM for review and approval.

At least 60 days prior to the start of operations, the project owner shall submit the required letters of request to the FAA and request that Southern California TRACON submit aerodrome remarks to the listed agencies. The project owner shall submit copies of these requests to the CPM. A copy of any resulting correspondence shall be submitted to the CPM within 10 days of receipt.

If the project owner does not receive a response from any of the above agencies within 45 days of the request (or by 15 days prior to the start of operations) the project owner shall follow up with a letter to the respective agency/ies to confirm implementation of the request. A copy of any resulting correspondence shall be submitted to the CPM within 10 days of receipt.

The project owner shall contact the CPM within 72 hours if notified that any or all of the requested notices cannot be implemented. Should this occur, the project owner shall appeal such a determination, consistent with any established appeal process and in consultation with the CPM. A final decision from the jurisdictional agency denying the request, as a result of the appeal process, shall release the project owner from any additional action related to that request and shall be deemed compliance with that portion of this condition of certification.

TRANS-9 Obstruction Marking and Lighting The project owner shall install obstruction marking and lighting on any construction equipment and

permanent structures that exceed 80 feet in height in accordance with FAA requirements, as expressed in the following documents:

- **FAA Advisory Circular 70/7460-1K**
- **FAA Safety Alert for Operators (SAFO) 09007.**

Lighting shall be operational 24 hours a day, 7 days a week for the duration of project construction and operation. Upgrades to the required lighting configurations, types, location, or duration shall be implemented consistent with any changes to FAA obstruction marking and lighting requirements.

Verification: At least 10 days prior to start of operations, the project owner shall provide the CBO and CPM proof in writing of approval by the FAA for all structure marking and lighting.

REFERENCES

CEC 2005a- CEC (CEC-800-2005-001-CMF). El Segundo Power Redevelopment Project Commission Decision, dated 2/2005.

CEC 2010a- CEC (CEC-800-2010-015). El Segundo Power Redevelopment Project Amendment Commission Decision, dated 6/2010.

CEC 2013a- CEC / C. Marxen (TN 70818). Notice of Receipt for the Petition to Amend, dated 5/14/2013. Submitted to CEC on 4/23/2013.

LL 2013e- Locke Lord / J. McKinsey (TN 200464). Applicant's Responses to Data Requests in Set One (#1-83). Submitted to CEC on 9/12/2013.

LL 2013f- Locke Lord / J. McKinsey (TN 200532). Applicant's Responses to Data Requests in Set Two (#84-90). Submitted to CEC on 9/19/2013.

LL 2013g- Locke Lord / J. McKinsey (TN 200532). Applicant's Supplemental Responses to Certain Data Requests in Set One (17, 19, 23, 34, 36, 38, 40 and 56). Submitted to CEC on 9/23/2013.

LL 2013i- Locke Lord / J. McKinsey (TN 200097). Sierra Research Supplemental Impact Analysis for the EI Segundo Power Facility Modification Project. Letter dated July 31, 2013, to South Coast Air Quality Management District. Submitted to CEC on 7/31/2013.

LL 2013j- Locke Lord / J. McKinsey (TN 201082). Data Request 87 of Data Request Set Two. Submitted to CEC on 10/30/2013.

LL 2013k- Locke Lord / J. McKinsey (TN 201092). Data Requests in Set Three (#91-92). Submitted to CEC on 10/31/2013.

LL 2013n- Locke Lord / J. McKinsey (TN 201186). Applicant's Responses to Data Requests in Set Four (#93). Submitted to CEC on 11/13/2013.

NRG 2013a- NRG / El Segundo Energy Center LLC (TN 70442) Petition to Amend, dated April 2013. Submitted to CEC on 04/23/2013.

NRG 2013b- NRG / El Segundo Energy Center LLC (TN 201000) ESEC Operational Employees. Submitted to CEC on 10/23/2013.

TRAFFIC AND TRANSPORTATION - FIGURE 1

El Segundo Energy Center - Regional Road Network

CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCE: AFC Figure 3.11-1

TRAFFIC AND TRANSPORTATION - FIGURE 2

El Segundo Energy Center - Local Road Network

TRAFFIC AND TRANSPORTATION

CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCE: AFC Figure 3.11-2

TRAFFIC AND TRANSPORTATION - FIGURE 3

El Segundo Energy Center - Study Intersections

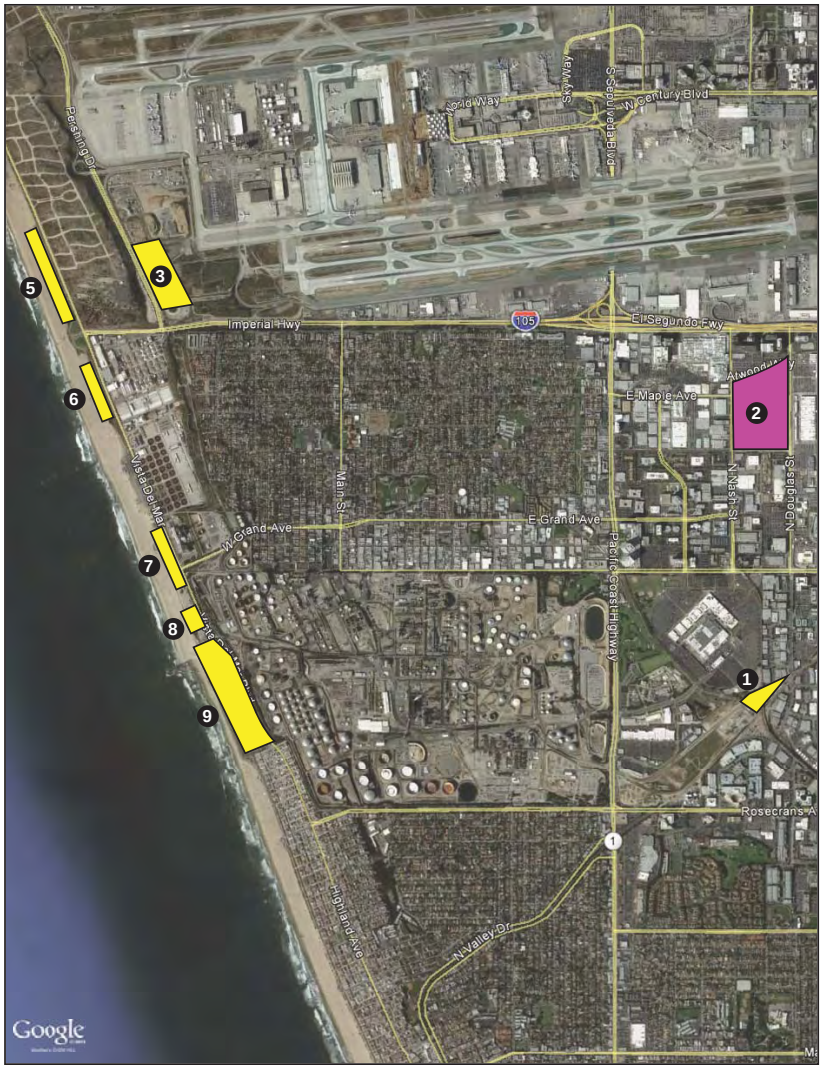
TRAFFIC AND TRANSPORTATION

CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCE: AFC Figure 3.11-3

TRAFFIC AND TRANSPORTATION - FIGURE 4

El Segundo Energy Center - Construction Laydown Areas

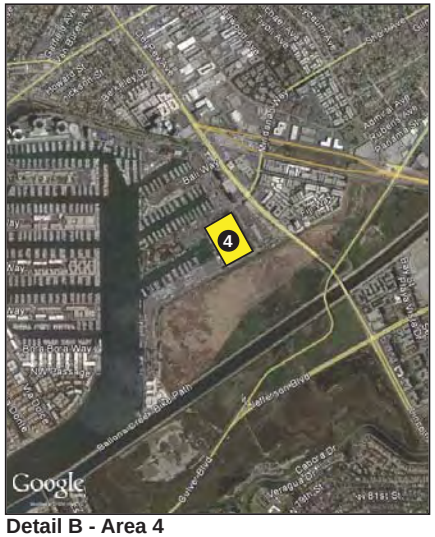


Detail A - Areas 1 through 9 (Excluding 4)

North

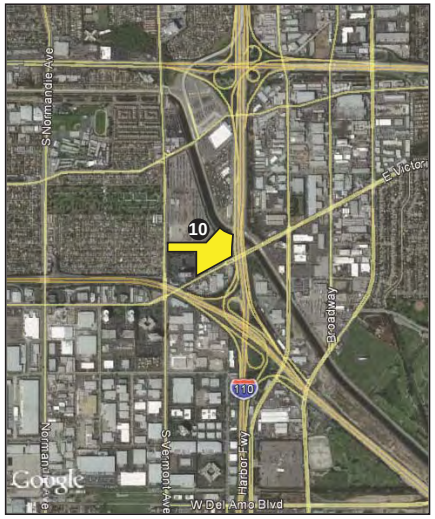
0 1250 2500

Approximate scale in feet



Detail B - Area 4

Off-Site Laydown and Parking Areas Location Map



Detail C - Area 10

Approved Laydown and Parking Areas

PTA Removed Laydown and Parking Area (Approved/Included in Previous PTA)

Laydown and Parking Areas	PARKING	LAYDOWN
1 Kramer		●
2 Fedex	●	●
3 LAX-Pershing	●	●
4 Marina del Rey Boat Launch	●	
5 Dockweiler State Beach	●	
6 Hyperion	●	
7 Grand Avenue	●	
8 Chevron Marine Terminal		●
9 Power Plant Site		●
10 190th Street	●	●

TRAFFIC AND TRANSPORTATION

CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCE: AFC Figure 2-10

TRAFFIC AND TRANSPORTATION - FIGURE 5

El Segundo Energy Center - Other Transportation Systems

CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCE: Bing

TRAFFIC AND TRANSPORTATION-APPENDIX-1
PLUME VELOCITY ANALYSIS

Wenjun Qian, Ph.D., P.E.

INTRODUCTION

The following provides the assessment of the proposed new gas turbines with heat recovery steam generator (HRSG) and auxiliary boiler exhaust stack plume velocities at El Segundo Energy Center (ESEC). Energy Commission staff (staff) completed calculations to determine the worst-case vertical velocities at different heights above the stacks using the project owner's proposed gas turbines/HRSGs design.

PROJECT DESCRIPTION

The facility owner proposes to replace existing boiler Units 3 and 4 with a GE 7FA combined-cycle gas combustion turbine generator with HRSG and two Rolls Royce Trent 60 simple-cycle gas turbines. Cooling for the combined-cycle unit would be provided by a Heller dry cooling tower system. The combined-cycle unit would also include a small auxiliary boiler rated at 36 MMBtu/hr to reduce start-up duration.

PLUME VELOCITY CALCULATION METHOD

Staff has selected a calculation approach from a technical paper (Best 2003) to estimate the worst-case plume vertical velocities for the proposed new ESEC exhausts. The calculation approach, which is also known as the "Spillane approach", used by staff is limited to calm wind conditions, which are the worst-case wind conditions. The Spillane approach uses the following equations to determine vertical velocity for single stacks during dead calm wind (i.e. wind speed = 0) conditions:

(1) $(V^*a)^3 = (V^*a)_o^3 + 0.12^*F_o^*[(z-z_v)^2-(6.25D-z_v)^2]$
(2) $(V^*a)_o = V_{exit}^*D/2^*(T_a/T_s)^{0.5}$
(3) $F_o = g^*V_{exit}^*D^2*(1-T_a/T_s)/4$
(4) $Z_v = 6.25D^*[1-(T_a/T_s)^{0.5}]$

Where: V = vertical velocity (m/s), plume-average velocity

a = plume top-hat radius (m, increases at a linear rate of $a = 0.16*(z- z_v)$
F_o= initial stack buoyancy flux m^4/s^3
z = height above ground (m)
z_v= virtual source height (m)
V_{exit}= initial stack velocity (m/s)
D = stack diameter (m)
T_a= ambient temperature (K)
T_s= stack temperature (K)
g = acceleration of gravity (9.8 m/s^2)

Equation (1) is solved for V at any given height above ground that is above the momentum rise stage for single stacks (where z > 6.25D) and at the end of the plume merged stage for multiple plumes. This solution provides the plume-average velocity for the area of the plume at a given height above ground; the peak plume velocity would be higher than the plume-average velocity predicted by this equation. As can be seen the stack buoyancy flux (F_o) is a prominent part of Equation (1). The calm condition calculation basis clearly represents the worst-case conditions, and the vertical velocity will decrease substantially as wind speed increases.

For multiple stack plumes, where the stacks are equivalent, the multiple stack plume velocity during calm winds was calculated by staff in a simplified fashion as follows:

(5) $V_m = V_{sp} * N^{0.25}$

Where: V_m = multiple stack combined plume vertical velocity (m/s)
V_{sp} = single plume vertical velocity (m/s), calculated using Equation (1)
N = number of stacks

Staff notes that this simplified multiple stack plume velocity calculation method predicts somewhat lower velocity values than the full Spillane approach methodology as given in data results presented in the Best paper (Best 2003). However, the simplified multiple stack approach is still conservative given the conservatism of the rest of the calculation.

VERTICAL PLUME VELOCITY ANALYSIS

The calm wind condition vertical plume velocities were calculated for the proposed gas turbines and HRSG. The worst case ambient and exhaust conditions for the gas turbines/HRSG and the only exhaust condition supplied for the dry cooling tower (which is for a high ambient temperature case that may not be the worst case), operating at full load, are provided below in **PLUME VELOCITY Table 1**.

For the gas turbines/HRSG, the conditions modeled are worst case or full load operating conditions under 41°F ambient temperature. Staff also modeled plume velocities using the exhaust parameters at higher ambient temperatures and determined that results for higher ambient temperatures did not exceed the results for the 41°F ambient conditions. For the dry cooling tower, the facility owner only provided one exhaust condition and staff is not certain if lower temperatures would have worse thermal plumes. But staff expects that lower temperature conditions would be only marginally worse assuming that the heat rejection demand for the dry cooling tower does not drop substantially at lower ambient temperatures.

PLUME VELOCITY Table 1
Gas Turbines/HRSG and Dry Cooling Tower Parameters

Case	GE turbine/HRSG		Trent turbines	Dry Cooling Tower
	Non-duct fired	Duct Fired		
Ambient Temperature °F	41			83.7
Stack Height ft (m)	210 (64)		150 (45.72)	67 (20.42)
Stack Diameter ft (m)	20 (6.096)		11.1 (3.38)	36 (10.97) – each of the 7 cells
Stack Velocity ft/s (m/s)	66.6 (20.31)	65.5 (20.00)	121.8 (37.12)	28.64 (8.73)
Exhaust Temperature °F (K)	233 (384.8)	219 (377.04)	799 (699.26)	176 (353.15)

Source: NRG 2013a, LL 2013e, LL 2014b

Using the Spillane calculation approach, the plume average vertical velocity at different heights above ground was determined by staff for calm wind conditions. Staff's calculated plume average velocity values are provided in **PLUME VELOCITY Table 2**. The GE turbine/HRSG plume velocities are calculated as single exhaust with and without duct firing. The Trent turbines plume velocities are calculated for a single gas turbine exhaust and the worst case combined gas turbine exhaust (equivalent to two gas turbines using Equation 5 listed above). The separation between the two Trent turbine stacks is only 6.5 meters. It is assumed that plumes from the two stacks will have merged at the height where the plume average velocity drops below 4.3 m/s under worst case conditions. The dry cooling tower was modeled using 7 cells as shown on the site plan. It is assumed that plumes from these 7 cells will have merged under worst case conditions.

As explained in the Transportation and Traffic section a vertical velocity of 4.3 m/s has been determined as the critical velocity of concern to light aircraft. For the GE turbine cases, the heights at which the plume average velocity drops below 4.3 m/s are calculated to be approximately 830 feet with duct firing and 870 feet without duct firing for the 41°F ambient temperature. For the Trent turbines case, single turbine and maximum combined turbines, the heights at which the plume average velocity drops below 4.3 m/s are calculated to be approximately 950 feet and 1,460 feet, respectively for the 41°F operating case. For the dry cooling tower, the height at which the plume average velocity drops below 4.3 m/s is calculated to be approximately 2,020 feet assuming plumes from the 7 cells have merged. It should be noted that the distance of separation between the dry cooling tower and the GE turbine is about 34 meters and the distance of separation between the GE turbine and the Trent turbines is about 48 meters. Additional thermal plume merging between the gas turbines/HRSG and the dry cooling tower could occur and increase the plume heights where vertical velocities of 4.3 m/s are exceeded under worst case conditions. The model used for this analysis is not able to add different kinds of thermal plumes together. However, the approach is still conservative given the conservatism built in the model.

Staff also calculated the plume velocity from the auxiliary boiler and found the plume average velocity drops below 4.3 m/s at 80 feet, which would have less than significant impacts to aviation.

PLUME VELOCITY Table 2
Gas Turbines/HRSG Worst-Case Predicted Plume Velocities

	GE turbine/HRSG		Trent turbines		Dry Cooling Tower
Height (ft)	Non-duct fired 41°F	Duct Fired 41°F	Single Turbine 41°F	Two Turbines Combined 41°F	Seven Cells Combined 83.7°F
300	13.80	13.57	8.89	10.58	7.19
400	7.53	7.40	6.74	8.01	7.24
500	6.01	5.88	5.83	6.93	6.87
600	5.27	5.16	5.29	6.29	6.50
700	4.81	4.70	4.90	5.83	6.18
800	4.48	4.38	4.62	5.49	5.91
900	4.23	4.13	4.39	5.22	5.68
1,000	4.03	3.94	4.20	4.99	5.48
1,100	3.86	3.77	4.04	4.80	5.30
1,200	3.72	3.63	3.90	4.64	5.15
1,300	3.60	3.51	3.78	4.49	5.01
1,400	3.49	3.41	3.67	4.37	4.88
1,500	3.40	3.32	3.58	4.25	4.76
1,600	3.31	3.23	3.49	4.15	4.66
1,700	3.23	3.16	3.41	4.06	4.56
1,800	3.16	3.09	3.34	3.97	4.47
1,900	3.10	3.02	3.27	3.89	4.39
2,000	3.04	2.96	3.21	3.82	4.31
2,100	2.98	2.91	3.15	3.75	4.24

Source: Staff calculations.

The values listed above in **PLUME VELOCITY Table 2** are plume average velocities across the area of the plume. The maximum plume velocity, based on a normal Gaussian distribution, is two times the plume average velocities shown in the table.

WIND SPEED AND TEMPERATURE STATISTICS

PLUME VELOCITY Table 3 provides the hourly average wind speed and temperature statistics for the meteorological data at Los Angeles International Airport (LAX) during 2005-2009 provided in the Petition to Amend (NRG 2013a). Calm or very low wind speeds can also occur for shorter periods of time within each of the monitored average hourly conditions. It should be noted that LAX is somewhat sheltered by the El Segundo Dunes and the wind speeds at the ESEC site are likely higher than those measured at LAX, so these data should conservatively represent the ESEC site.

PLUME VELOCITY Table 3
Wind Speed and Temperature Statistics for LAX

Wind Speed		Temperature		Temperature and Wind Speed	
≤ 1 m/s	22.53%	≤ 40°F	0.08%	≤ 1 m/s, ≤ 40°F	0.00%
≤ 2 m/s	52.25%	≤ 50°F	5.94%	≤ 1 m/s, ≤ 50°F	2.17%
≤ 3 m/s	69.13%	≤ 60°F	45.83%	≤ 1 m/s, ≤ 60°F	14.39%

Source: Staff data reduction of LAX meteorological data (NRG 2013a).

Calm conditions/ low wind speeds are not frequent in the site area but that they do occur, which is the condition most favorable for the formation of higher velocity thermal plumes from gas turbines, HRSGs, and dry cooling towers.

CONCLUSIONS

The calculated worst case calm wind condition vertical plume average velocities from the proposed new gas turbines/HRSG and dry cooling tower (high temperature case for the dry cooling tower rather than being the known worst case) are predicted to exceed 4.3 m/s at heights as much as approximately 870 feet, 1,460 feet, and 2,020 feet above ground level for the GE turbine/HRSG, Trent turbines, and dry cooling tower, respectively. There is the potential, depending on the heat rejection and exhaust parameters at lower ambient temperatures, that the dry cooling tower vertical plume average velocities would be estimated to exceed 4.3 m/s at elevations somewhat higher than the 2,020 feet estimated for an ambient temperature of 83.7°F for calm wind conditions at lower ambient temperatures. Also, there is the potential for additional thermal plume merging between the gas turbines/HRSG and the dry cooling tower that could increase the plume heights where vertical velocities of 4.3 m/s are exceeded under worst case conditions. Ambient conditions (wind speeds less than 1m/s) conducive to the formation of thermal plume velocities of concern would occur on average approximately 22.5 percent of the time.

REFERENCES

Best, P. et al. 2003. Aviation Safety and Buoyant Plumes. Presented at the Clean Air Conference, Newcastle, New South Wales, Australia. By Peter Best, Lena Jackson, Mark Kanowski of Katestone Environmental, Toowong, Queensland, Australia and Kevin Spillane of Bendigo, Victoria, Australia.

LL 2013e - Locke Lord / J. McKinsey (TN 200464). Applicant's Responses to Data Requests in Set One (#1-83). Submitted to CEC on 9/12/2013.

LL 2014b - Locke Lord / J. McKinsey (TN 201467). Response to Data Request Set Five (#94). Submitted to CEC on 1/6/2014.

NRG 2013a - NRG / El Segundo Energy Center LLC (TN 70442) Petition to Amend, dated April 2013. Submitted to CEC on 04/23/2013

VISUAL RESOURCES

Testimony of William Kanemoto

SUMMARY OF CONCLUSIONS

California Energy Commission staff (hereafter referred to as staff) has analyzed visual resource-related information pertaining to the proposed modification plan to the El Segundo Energy Center (ESEC) and concludes that the proposed amended project would result in less than significant impacts to existing visual resources within the project viewshed.

If the Energy Commission approves the El Segundo Power Facility Modification (ESPFM), staff recommends that conditions of certification from the Commission Decision for the originally certified El Segundo Power Redevelopment (ESPR) Project (ESEC 2005 and 2007), as modified and augmented herein by staff, be adopted in order to minimize impacts and ensure the amended project conforms with all applicable laws, ordinances, regulations, and standards (LORS).

INTRODUCTION

Visual resources are the natural and cultural features of the environment that can be viewed. This analysis focuses on whether the ESEC would cause significant adverse visual consequences and whether the project would be in compliance with applicable LORS. The California Environmental Quality Act (CEQA) requires the Energy Commission to determine the potential for significant impacts to visual resources resulting from the proposed project. **Appendix VR-1** describes the visual resources methodology employed for the CEQA analysis (Energy Commission staff's methodology), and the "Method and Threshold for Determining Significance," subsection below, describes the thresholds for determining environmental consequences (as discussed above in the "Summary of Conclusions" subsection). In accordance with staff's procedure, conditions of certification are proposed as needed to reduce potentially significant impacts (under CEQA) to less than significant levels or to the extent possible, and to ensure LORS conformance, if feasible.

EXISTING PROJECT VISUAL SETTING

The existing El Segundo Generating Station (ESGS), including the previously permitted ESPR 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 vicinity of the project site southward, views to the Bay from Vista del Mar are blocked by developed portions of the existing ESGS site, 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 proposed ESPFM project would be located within the existing ESGS site in the approximate location of the existing Units 3 and 4 power block, which would be demolished and replaced by the proposed Units 9, 10, 11 and 12. The proposed ESPFM Units 9 – 12 site occupies the central portion of the ESGS facility, directly south of Units 5 through 8. The site is situated at the foot of a tall coastal bluff (approximately 90 feet tall in the project vicinity) that extends for much of the Santa Monica Bay coastline. **Visual Resources Figure 1**, **ESEC Project Site**, depicts views of the existing ESGS site.

The site is currently visually dominated by the recently constructed Units 5 though 8, in the northernmost portion of the site, and the Units 3 and 4 power block immediately to their south. The tall heat-recovery steam generators (HRSGs) and exhaust stacks of Units 5 and 7, and the large power block and tall exhaust stacks of Units 3 and 4, are visible to background distances of 3 miles or more in views to the north and south. Units 3 and 4 have a top-of-power block elevation of 156 feet, and a top-of-exhaust stack height of 215 feet. Exhaust stacks of Units 5 and 7 are comparable in height to Units 3 and 4; the HRSGs are less tall than the Unit 2 and 3 power block, with considerably smaller footprints. (Units 6 and 8 are lower in height than the HRSGs). Thus, the existing power block and exhaust stacks extend above the top of the bluff and Vista del Mar. The existing structures (Units 2 and 3, and 5 through 8) present disordered, visually cluttered views of 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 site recently planted landscape screening on most of its eastern (Vista del Mar) frontage, which will ultimately help screen and soften the presence of the power plants from the immediately adjacent section of roadway with maturation of the plantings. A recently- constructed, approximately 1,700-foot-long decorative seawall adjoins the public bike path/hiking trail immediately west of the project site, at the edge of the adjoining section of state beach. A landscaped berm installed in accordance with original Condition of Certification **VIS-9,** borders the southern edge of the ESEC site along 45th Avenue, and the southwest frontage facing the bike path and the beach.

PROJECT VIEWSHED

The *viewshed* or area of potential visual effect (the area within which the project could potentially be seen) is delineated in **Visual Resources Figure 2**, **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) in views 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 project viewshed into landscape units, 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 key observation points (KOPs) are discussed 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 2**, the viewshed is divided into a coastal industrial zone within which the ESGS itself is located; coastal open space, encompassing the areas with unimpeded views to Santa Monica Bay, including Manhattan and Dockweiler State Beaches; and residential neighborhoods of the Cities of Manhattan Beach and El Segundo.

Coastal Industrial Landscape

The project site, although situated within the scenic coastal zone, occupies a portion of an extensive coastal heavy industry zone extending to the 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 45th Avenue north to Imperial Highway, approximately 1-1/2 miles to the north of the site. Industrial uses within this area include the adjacent Chevron marine loading facility immediately to the north of the site, the Chevron Refinery to the east, and the Los Angeles Department of Water and Power (LADWP) Scattergood Power Plant and Hyperion Wastewater Treatment facilities to the north. Public coastal access to the beach west of the project site 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 project site. (**Visual Resources Figure 3, Industrial Facilities in the Project Viewshed**), depicts this area.

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, 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 a generally attractive roadway corridor. 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 Wastewater 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 marked by

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 project, views from Vista del Mar to the Bay are largely blocked by a combination of the power plant facilities and perimeter landscape screening. These power plant facilities and the perimeter landscape screening filter 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 ESGS power blocks and stacks are the only features within the wider viewshed which block views from Vista del Mar to Santa Monica Bay.

This landscape type dominates much of the viewshed, but no KOPs were identified within this landscape type because potential viewers in these locations (Chevron, Scattergood, Hyperion workers, etc.) were presumed to have low visual sensitivity or concern with project impacts due to the industrial, work-related nature of their activities.

Coastal Open Space

This portion of the viewshed consists of the public beaches and adjacent Vista del Mar. Visual quality is high, characterized by predominantly intact, panoramic views of Santa Monica Bay, which extend to the horizon to the north, west, and south and include views of beaches and background mountains. (See **Visual Resources Figure 4**, **Views of Project Site from Nearby Beaches)**. As described above, the ESGS and other industrial facilities compromise the otherwise outstanding visual character and quality of the area. 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, emphasizing seaward views. The portion of Dockweiler State Beach immediately adjoining the project site to the west is generally very narrow due to beach erosion. The Marvin Braude bike trail, abutting the project site, forms a link in this section between the widely-used areas of Dockweiler State Beach to the north and Manhattan State Beach to the south. 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 bluff-top position, offering largely unobstructed views of Santa Monica Bay. Viewer concern is considered high on the beaches due to the recreational and scenery-oriented nature of viewers' activities; and moderately high on Vista del Mar, reflecting the combination of recreationists, tourists, and residents with higher viewer concern, and commuters and others with lower levels of viewer concern.

The project owner's simulations were taken from the 2013 PTA. To follow the analysis of this staff assessment, a new KOP numbering system is adopted for this report, as described below and depicted in **Visual Resources Figure 3**. For each KOP, the equivalent KOP number from the Applicant's 2013 PTA is provided in parentheses.

Key viewpoints within this landscape unit include:

KOP 1 - Dockweiler Beach (Petition To Amend (PTA) KOP 1)

KOP 2 - Dockweiler Beach West of ESGS (PTA KOP 7)

KOP 3 - Manhattan Beach State Park (PTA KOP 2)

KOP 4 - Vista del Mar – Manhattan Beach (PTA KOP 3)

KOP 5 - Vista del Mar – El Segundo (PTA KOP 8)

Manhattan Beach Residential

Potential sensitive receptors within this portion of the viewshed include residents of homes in the city of Manhattan Beach along 45th Street and The Strand. Views of the project site from the vicinity of 45th Street are largely screened by the existing landscaped berm, and Units 5 -8 are screened to a large extent by the nearer existing Units 3 and 4. Residents of 45th Street would have views of the proposed Units 9 –12, and very prominent views of laydown and construction activities at the tank farm site. **Visual Resources Figure 5, Views from Manhattan Beach Residences**, presents views to the project site from the nearby residential neighborhood. Key viewpoints within the Manhattan Beach residential landscape unit include:

KOP 6 – 45th Street, Manhattan Beach (PTA 10)

AMENDED PROJECT VISUAL DESCRIPTION

Visual Resources Table 1 provides a list of the major project features that would contribute to visual change of the landscape, with their dimensions. A more detailed discussion of the proposed project is presented in the **Project Description** section of this document.

Visual Resources Table 1: Key Project Components

TABLE 2-1
Dimensions of Significant Structures

Structure	Dimensions (FT)		
	Height	Length	Width
NEW STRUCTURES			
Combined Cycle Turbine			
Combustion Turbines	25	102	23
HRSGs (New), Tier 1	80.0	107	35
CTG Inlet	70	51	27
Simple Cycle Turbines			
Trent60 CTG x 2	15	104	31
CTG to Stack Transition x2	35	48	36
Other equipment			
Main Aux Transformer	30	42	26
Fin-Fan Cooler	29	93	44

TABLE 2-1
Dimensions of Significant Structures

Structure	Dimensions (FT)		
	Height	Length	Width
Elect Room	10	44	17
Steam Transformer	30	42	26
Steam Turbine	20	100	32
Cooling Tower	67	232	53
New Administration/Warehouse Building	40	150	100

Note: Table B-1 NRG El Segundo building dimensions used for air quality modeling.

Visual Resources Figure 6 depicts a schematic isometric view of the proposed Units 9 through 12, illustrating the relative scale and proportion of the major power plant components.

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 proposed Unit 9 would have a top-of-HRSG elevation of 80 feet, considerably shorter than the existing power block, and a top-of-stack elevation of 210 feet, similar to the existing stacks. The new cooling tower structure would be 67 feet tall and 232 feet long. The exhaust stack structures of Units 11/12 would be directly adjoined. Unit 10 would not have a traditional exhaust stack. Individually, the new components would be smaller than the existing Units 3 and 4 power block; taken together, they would also be smaller and considerably less tall and bulky than the existing units.

The proposed new administration/warehouse building would be two stories (up to 40 feet tall), located on the northwest corner of the elevated building pad of the former storage tank site, approximately 600 feet south of the proposed power plant site, and approximately 100 feet east of the bike trail. **Visual Resources Figure 7** depicts a simulated view of the proposed administration building from Dockweiler State Beach looking east.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS (LORS)

Staff also evaluates the project to determine compliance with federal, state and local LORS. **Visual Resources Table 3** lists relevant LORS pertaining to aesthetics or the preservation and protection of sensitive visual resources, and presents a discussion of project conformance with them. **Visual Resources Table 3** may be found at the end of the section, following the discussion of project impacts and mitigation under CEQA, under “Compliance with Applicable LORS.”

The principal visual resource issues of this and previous phases of the project's proceedings have involved LORS conformance. In the current proceeding, as in the original proceeding, the mitigation measures required under the visual resources conditions of certification were not in response to project impacts against the baseline of the existing power plant. Because the visual baseline of the pre-existing ESGS facility represented a setting of poor visual quality (due primarily to the power plant itself), the continuation of that condition of poor visual quality through introduction of new generation units would not constitute a significant adverse change in visual quality, but simply a continuation of a degraded condition. Rather, the original conditions of certification were generated in response to the fact that both the existing and proposed site constitute a 'visually degraded area' of the coastal zone as described in Section 30251 of the Coastal Act. The Coastal Commission and Energy Commission staff interpret the intent of that section to require visual restoration and improvement of such sites to the extent feasible if such uses are approved.

In the original proceeding staff found, and the California Coastal Commission (CCC) concurred, that the project setting was "visually degraded, due in large part to the presence of the [existing] facility," pursuant to Section 30251 of the Coastal Act (see **Appendix VR-2**). Section 30251 requires permitted developments ". . . where feasible, to restore and enhance visual quality in visually degraded areas." The CCC recommended that specific provisions, reproduced in Condition of Certification **VIS-1**, be implemented if the project was certified, pursuant to Section 25523(b) of the Warren-Alquist Act and Section 30413(e) of the Coastal Act. These provisions called for the enhancement of views of the facility from areas accessible to the public.

The provisions of the conditions of certification from the original proceeding, including Condition of Certification **VIS-1,** were incorporated into the subsequent Energy Commission decision approving the amended application for ESEC Units 5 through 8, with modifications to those conditions due to the altered character of the proposed units. Specifically, under the amended ESEC application, the project units 5, 6 and 7 approved in 2005 were replaced with a proposal for ESEC Units 5 through 8, which utilized air-cooling rather than once-through cooling, and different turbine, generation and HRSG units. In contrast to the originally proposed units, the subsequently proposed project HRSGs were physically enclosed units with a visually simpler and less cluttered industrial appearance than those proposed under the original license of the project. They were also somewhat smaller in profile and footprint than the originally proposed units, and thus less visually obtrusive. With the 2007 ESEC modification of the power plant design, architectural screening of the HRSGs, required under Condition of Certification **VIS-1**, was considered by staff to no longer be necessary (since the bulk of the plant piping and equipment would already be architecturally enclosed as part of the manufacturer's design). Architectural screening under Conditions of Certification **VIS-1** and **VIS-4** was thus deleted and not included in Decision on the 2007 amendment. Other requirements of Condition of Certification **VIS-1**, including perimeter landscaping on Vista del Mar, construction of a decorative seawall along the beach, and construction of a tall landscaped berm on the ESGS site's 45th Avenue and southwest fence-lines (south and west of former storage tank site), were retained in the Decision and have largely been completed by the project owner. Thus, staff believes VIS-1 does not need to be retained for the current amendment. However, certain issues with implementation

of these measures remain, which are addressed in recommended modifications to Condition of Certification **VIS-2**. The project site with these improvements in their current state represents the baseline for evaluation of the ESPFM Units 9 through 12 in this analysis.

Although the now-operational ESEC Units 5 through 8 are less visually obtrusive than the originally proposed ESPR Units 5 through 7, they remain highly prominent industrial features that dominate the adjacent coastal landscape to middle-ground distance to the north, west and south. The site's prominent industrial character continues to contrast greatly with the surrounding natural beach environment, and remains incompatible with the nature- and scenery-oriented recreational and residential land uses that surround it. The ESGS site thus continues to be a 'visually degraded area' as defined under Section 30251 of the Coastal Act. However, extensive restoration and enhancement measures required under Conditions of Certification **VIS-1** through **VIS-9** for Units 5 through 8 have been carried out or are near completion. While these measures by no means negate the visual impairment of the coastal landscape by the power plant, they will in the long term result in visual improvement over the previously existing condition, and may represent the limit of feasible visual improvement measures in the context of the ESGS site. Staff has not identified additional available measures to further improve the site's visual condition, except as reflected in proposed modifications to recommended Conditions of Certification.

The current proposed replacement of existing Units 3 and 4 with Units 9 through 12 would result in noticeable visual improvement of the ESEC site, greatly reducing the bulk, footprint and industrial character of the site by the replacement of the Units 3 and 4 power block with smaller, lower components. However, even with this improvement, the ESGS would remain a highly prominent facility of very industrial character and would continue to be a 'visually degraded area' of the coastal zone. Unfortunately, beyond recommended modifications to Conditions included in this analysis, it is unclear that further substantial visual restoration or enhancement opportunities exist at the ESEC site, due to the absence of locations or opportunities for additional screening.

As discussed further below, if the Energy Commission approves the amended project, the previously required Conditions of Certification with recommended staff modifications should continue to be required under the current amendment.

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

This section includes information about the following:

1. Method and threshold for determining significance
2. Direct/indirect impacts and mitigation
3. Cumulative impacts and mitigation

METHOD AND THRESHOLD FOR DETERMINING SIGNIFICANCE

CEQA Criteria of Significance

The following regulatory criteria were considered in determining whether a visual impact would be significant under CEQA.

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?

As discussed above, because of the visually degraded baseline condition of the project site, significant visual impacts under CEQA are not anticipated, and are not the primary visual concern of the analysis. However the KOP analysis below provides a detailed CEQA analysis of anticipated impacts.

Key Observation Points (KOPs)

The visual resources approach is based on detailed analysis from representative Key Observation Points (KOPs). KOPs are selected to be representative of the most critical locations from which the project would be seen, based on strong anticipated project effects and high viewer sensitivity. KOPs for the proposed project include ones (1) along major travel corridors (Vista del Mar in Manhattan Beach (southbound) and El Segundo ((northbound)); (2) from recreational areas with visual access (Manhattan State Beach, Dockweiler State Beach); (3) at high-sensitivity residential locations with visual exposure to the project (Manhattan Beach residences along 45th Avenue and The Strand).

At each KOP, the existing landscape is characterized. Photographs were obtained to indicate existing conditions without the project and then were modified to include a simulation of the project. Consequently, staff has a visual representation of the viewshed before and after a project is introduced to assist in the analysis.

Energy Commission staff evaluated the visual setting and proposed project in detail from several viewing areas represented by existing and simulated views of the following

six key observation points, provided by the project owner and shown in **Visual Resources Figure 3,** *Key Observation Points (KOPs).* The project owner's simulations were taken from the 2013 PTA. To follow the analysis of this staff assessment, a new KOP numbering system is adopted for this report, as described below and depicted in **Visual Resources Figure 3**. For each KOP, the equivalent KOP number from the Applicant's 2013 PTA is provided in parentheses.

- KOP 1 Dockweiler State Beach (PTA KOP 1)
- KOP 2 Dockweiler State Beach (near bike trail, ESGS site) (PTA KOP 7)
- KOP 3 Manhattan State Beach (PTA KOP 2)
- KOP 4 Vista del Mar - Manhattan Beach (northbound) (PTA KOP 3)
- KOP 5 Vista Del Mar - El Segundo (southbound) (PTA KOP 8)
- KOP 6 Manhattan Beach Residences (45th Avenue) (PTA KOP 10)

Each of these six key observation points is shown on **Visual Resources Figure 3**. At each KOP a visual analysis was conducted. A discussion of the visual setting and anticipated visual change for each KOP is presented in the subsection entitled, "C. Visual Character or Quality," below, and summarized in **Visual Resources Table 2**. Existing and simulated views of the KOPs may be found at the end of this section, with other figures.

DIRECT/INDIRECT IMPACTS AND MITIGATION

This analysis considered the potential impacts of the proposed project in relation to the four significance criteria for visual resource impacts listed in Appendix G of the CEQA Guidelines, under Aesthetics, specified above.

A. Scenic Vistas

"Would the project have a substantial adverse effect on a scenic vista?"

For the purposes of this analysis, a *scenic vista* is defined as a designated scenic vista (identified in public planning documents); a view of high scenic quality perceived through and along a corridor or opening; or a view from a designated scenic area.

No. Views from the two adjacent state beaches, and from Vista del Mar, may be considered scenic vistas. The proposed Units 9 – 12 project would result in improvement to these views through removal of the very large Units 3 and 4 power block and their replacement with much smaller Units 9 – 12. While views from beaches to the north and south would be improved slightly, views from the adjoining beach and bike path to the west of ESGS would be improved substantially, and views of the Santa Monica Bay from Vista del Mar to the east would be opened considerably.

B. Scenic Resources

”Would the project substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?”

For the purpose of this analysis, *scenic resources* include a unique water feature (waterfall, transitional water, part of a stream or river, estuary); a unique physical geological terrain feature (rock masses, outcroppings, layers or spires); a tree having a unique/historical importance to a community (a tree linked to a famous event or person, an ancient, old growth tree); historic building; or other scenically important physical features, particularly if located within a designated federal scenic byway or state scenic corridor.

No. There are no scenic resources within the project site, so construction of the proposed units would not affect any such physical features.

C. Visual Character or Quality

”Would the project substantially degrade the existing visual character or quality of the site and its surroundings?”

CEQA Criterion C is determined in this analysis by staff’s visual sensitivity/visual change assessment methodology, applied through analysis of representative KOPs throughout the project viewshed.

No. Within the framework of CEQA analysis, this study treats the existing condition, comprising Units 2, 3, and 5 through 8, as the baseline condition. From this perspective, the removal of the Units 3 and 4 power block and their replacement with proposed Units 9 through 12 would reduce the bulk and prominence of the generation facilities and increase view corridors to the Santa Monica Bay as seen from Vista del Mar. Thus, from all KOPs, the proposed condition would represent a visual improvement over the existing condition, a beneficial impact overall.

A detailed CEQA analysis is provided below by KOP. The visual analysis under Criterion C is organized into two categories: 1) construction impacts and 2) operational impacts.

Construction Impacts and Mitigation

Both construction activities and construction laydown and storage could create prominent, visually cluttered views that strongly detract from scenery-oriented recreational activities at adjoining beaches, or from scenic vistas of the bay and beaches as seen from Vista del Mar or other public roads in the coastal zone.

The entire construction and commissioning schedule is anticipated to last approximately 30 months. The decommissioning, demolition, and removal of existing Units 3 and 4 is anticipated to take approximately 6 months. Following completion of site preparation activities, construction and startup of the ESEC from site

mobilization to commercial operation is expected to take approximately 24 months. No beach delivery of equipment is proposed.

Laydown and storage would be handled in three phases. Those items requiring long-term storage would be located at the offsite facility at 190th Street in Los Angeles near the intersection of the 110 and 405 freeways, used previously in the 2010 amendment for staging of Units 5 - 8. Components scheduled to be placed into their final location will be staged onsite in the area of the currently abandoned fuel oil storage tanks at the south end of the property. Components located here will be temporary and on a revolving short-term basis. As construction logistics allow, some items will be located directly in the work area.

Off-site staging has occurred over the period of construction of Units 5 – 8 and has not had adverse impacts. The off-site staging site at 190th Street is screened at the perimeter with opaque fencing, and is located in an industrial area with poor visual quality and low visual sensitivity. No adverse effects are thus anticipated from that site's continued use.

Construction activities at the former tank farm staging and laydown site have been a concern of residents in Manhattan Beach. The landscaped berm installed under previous Condition of Certification **VIS-9** was intended in part to provide partial screening of the tank farm laydown activities. However, at this date the landscape plantings on the berm are not mature and do not provide visual screening of proposed equipment laydown. Staff thus recommends new Visual Resources Condition of Certification **VIS-10, Screening of Construction and Laydown Sites** to address potential impacts of equipment staging during the construction period. Although this measure would not eliminate all visual impacts from construction or construction staging, it would reduce the visual clutter and disorder of such activities and, because the activities would be temporary, help reduce their effects to a less-than-significant level.

Operational Impacts and Mitigation

An analysis of operation impacts was conducted for the view areas represented by the key viewpoints selected for in-depth visual analysis. The results of the operation impact analysis are discussed below by each KOP presented in **Visual Resources Table 2**. The visual impacts of night lighting are discussed in a separate section of this analysis. For each KOP, an evaluation of visual contrast, project dominance, and view blockage is presented with a concluding assessment of the overall degree of visual change caused by the proposed project. Visual change is then considered within the context of the landscape's visual sensitivity to arrive at a determination of visual impact significance.

The analysis that follows is based in part on visual simulations provided by the project owner and reproduced at the end of this section. These images were reviewed by staff at 'life-sized' scale to support the impact analysis. It should be noted that judgments of visual contrast and dominance should ideally be based on reproductions of the simulations at such 'life-sized' scale (i.e., at a scale that reproduces the viewing conditions as seen by the naked eye at the site of the KOP).

Based on camera lens information provided to staff, this implies figure reproduction at approximately ledger-size, viewed at normal reading distance. If simulations are viewed at a smaller reproduction scale, the resulting reduction in *apparent* visual scale should be borne in mind by the reader.

KOP 1 – Dockweiler State Beach

Visual Resources Figure 8A 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. This KOP represents typical conditions within the largest, most-used portion of the beach to the north of the ESGS.

Visual Quality: Moderately high. Views of the ESGS facility from foreground distance are of moderately low quality. From foreground distance the facility is large-scale, highly prominent, and visually unavoidable. The visually cluttered, disordered industrial character of the facility combines with prominent oil storage tanks of the Chevron refinery to the east to contrast strongly with its otherwise scenic, predominantly natural surroundings. However, despite the prominence of the existing ESGS facility, the visual quality at this KOP is considered moderately high overall due to the open panoramic views of the Bay and beaches in all other directions of view.

Viewer Concern: High. Viewer concern is considered high due to the recreational and scenery-oriented focus of beach visitors and their strong expectations of high scenic quality.

Viewer Exposure: Moderately low. Viewer exposure to the ESPFM Units 9 through 12 project site is moderately low from Dockweiler Beach to the north. This is because the HRSG/power block of existing ESEC Unit 5 would largely block views of the larger, taller components of Units 9 through 12, including portions of the tall exhaust stacks.

Overall Visual Sensitivity: Overall visual sensitivity of this KOP is therefore moderately high.

Visual Resources Figure 8B presents a visual simulation of the proposed project and illustrates the visibility of the project area as viewed from KOP 1.

Visual Contrast: Low. Visual contrast of the proposed Units 9 through 12 would be low as seen from the majority of Dockweiler Beach to the north of the ESGS due to screening of the units by the existing ESEC Unit 5 power block, and due to the similar industrial character of those proposed components that would be visible. Portions of the proposed new units would be visible and present moderate form contrast against the visual background of the city of Manhattan Beach. However, with surface color treatment with recessive, non-reflective colors to blend with the

background as called for in Condition of Certification **VIS-5**, as modified, contrast could be minimized.

Project Dominance*:* Low. In relation to the existing industrial setting dominated by ESEC Units 5 – 8, the visual dominance of Units 9 – 12 would be low from this KOP.

View Blockage: Low. View blockage from KOP 1 would also be low, for similar reasons. The existing Unit 5 would block views of much of proposed Units 9 – 12.

Overall Visual Change: Low.

Visual Impact Significance: Despite high overall viewer sensitivity at Dockweiler Beach, visual change from Units 9 – 12 would be low. Therefore, impacts would be less than significant.

Mitigation: In order to minimize potential contrast of new structures where visible from beaches, Condition of Certification **VIS-5**, Surface Color Treatment of Structures, as modified, is recommended. Staff recommends specification of painting of new units such that lower elevation (non-exhaust stack, non-office) structures be painted in a blue color to match existing Units 5 – 8, in order to provide maximum visual unity and harmony between the units.

Residual Impact Significance After Mitigation. Residual impacts in relation to the existing condition would be negligible.

KOP 2 – Dockweiler State Beach (foreground)

Visual Resources Figure 9A depicts the view toward the site from the rock groin at the northern boundary of the project site in Dockweiler Beach. In this discussion the view is meant to provide an overview of viewer conditions from adjoining portions of the beach, and particularly from the bike path abutting the site's western fence-line. Baseline conditions of this KOP are essentially similar to those just described for nearby KOP 1. However, dominance of the ESGS is higher due to viewers' proximity.

Visual Quality: Moderately high. Views of the ESGS facility and ESEC site from adjoining viewpoints are of moderately low quality. Even more than from KOP 1, the power plant components loom over viewers and completely dominate views to the north, east, and south. The visually cluttered, disordered industrial character of the facility contrasts strongly with the otherwise scenic, predominantly natural character of the beach and sea to the west. As depicted in **Visual Resources Figure 1** above, however, the highly industrial character of views from these adjoining areas has been greatly moderated by the addition of a tall, well-designed decorative sea wall adjoining much of the bike path along the plant's western fence-line. The 2200-foot-long wall introduces a substantial degree of visual unity to the path, and a strong element of decorative design. The wall also serves to screen views into the ground plane of the site, and to direct views westward away from the plant and toward the bay. As at KOP 1, visual quality is considered moderately high overall because of the outstanding quality of views away from the plant, toward the bay.

Viewer Concern: High. Viewer concern is considered high due to the recreational and scenery-oriented focus of beach visitors, bicyclists, and pedestrians, and their strong expectations of high scenic quality.

Viewer Exposure: High. Viewer exposure to the ESPFM Units 9 through 12 project site is very high from the bike path and adjoining beach.

Overall Visual Sensitivity: Overall visual sensitivity of this KOP is therefore high.

Visual Resources Figure 9B presents a visual simulation of the proposed project and illustrates the visibility of the project area as viewed from KOP 2.

Visual Contrast: As depicted in the simulation, the contrast of both the existing Units 3 and 4 and the proposed Units 9 – 12 with the surrounding scenic beach landscape is extremely strong. However, the overall *change* in contrast of nearby views as a result of the ESPFM project would be somewhat beneficial; that is, the contrast with the surrounding scenic beach setting would be similar in character but reduced somewhat by the reduced dominance of the new, smaller units. Contrast is thus low.

Project Dominance*:* Similarly, visual dominance of the proposed units, like the existing units, would be strong. However, the overall dominance of nearby views would be reduced somewhat by the new ESEC units because of their overall reduced profile, footprint and overall scale.

View Blockage: Substantial view blockage of sky as seen from the bike path occurs due to existing Units 3 and 4, and this would remain true but to a reduced degree under the proposed ESPFM project. Because of the reduced footprint and spatial separation of tall components under the new project, view blockage of the sky would decrease considerably.

Overall Visual Change: Overall contrast, dominance and view blockage of views from KOP 4 would be reduced in relation to the surrounding beach environment to a moderate degree by the proposed ESPFM project.

Visual Impact Significance: Visual impacts of the proposed project would be somewhat beneficial.

Mitigation: In order to minimize potential contrast of new structures where visible from beaches and to enhance visual unity of the power plant components, coloring of the cooling tower and all other non-exhaust stack features in a blue color to match the Units 5 – 8 HRSGs is recommended under Condition of Certification **VIS-5**, Surface Color Treatment of Structures.

Residual Impact Significance After Mitigation. Residual impacts in relation to the existing condition would be moderately beneficial.

KOP 3 - Manhattan Beach State Park

Visual Resources Figure 10A 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 near the project site.

Visual Quality – High. Visual quality from the area of this KOP is high due to the panoramic Bay views in three directions. The ESEC Units 5 - 8 are currently hidden behind Units 3 and 4 power block. The project facilities as a whole are visually co-dominant with the tank farm berm in the foreground.

Viewer Concern – High. Viewer concern is high due to the recreation and scenery focus of viewer activity.

Viewer Exposure – Moderate. Visibility of the proposed ESPFM site from this KOP is moderate. While the taller features of stacks and power block are currently highly visible, the lower elevations of the ESEC site are screened by the foreground berm. Overall exposure is thus moderate, despite the very high numbers of viewers.

Overall visual sensitivity is thus moderately high.

Visual Resources Figure 10B presents a visual simulation of the proposed project site and illustrates the visibility of the project area. The on-site storage tanks visible in both the existing and simulated views are existing Chevron storage tanks east of Vista del Mar. ESEC project laydown would be conducted at the level site atop and behind the landscaped berm during project construction.

Visual Contrast: While contrast with the natural surroundings of the ESGS facility, including the new units, would remain strong, the overall *change* in contrast as a result of the ESEC project would be somewhat beneficial; that is, the contrast with the surrounding scenic beach setting would be reduced somewhat by the elimination of the massive existing Units 3 and 4 power block.

Project Dominance*:* Visual dominance of the proposed units, like the existing units, would remain moderately strong. However, the overall dominance of views would be reduced somewhat by the elimination of the massive Units 3 and 4 power block and the reduced profile and overall scale of the new ESEC units.

View Blockage: View blockage of the sky would decrease considerably due to the elimination of the massive existing Units 3 and 4 power block.

Overall Visual Change: Overall contrast, dominance and view blockage of views from KOP 2 would be reduced in relation to the surrounding beach environment to a moderate degree by the proposed ESPFM project.

Visual Impact Significance: Visual impacts of the proposed project would be somewhat beneficial.

Mitigation: Conditions of certification as required under the original and previously approved amendment decisions, should also be applied to the current ESPFM proposal. In particular, implementation of the landscaped berm depicted in KOP 2 is not complete, and has encountered issues of plant survival and suitability of landscape plantings. In addition, approximately 800 feet of chain link fencing along the bike path has rusted due to the corrosive nature of the ocean's salt air. Staff has added an additional measure to **VIS-2** requiring replacement of this fencing with green coated fencing to match the existing perimeter fencing. Modifications to the landscape plan and installation , including fencing may be required to ensure effectiveness of these measures, as described under modifications of Condition of Certification **VIS-2**.

Residual Impact Significance After Mitigation. With successful resolution of issues with the landscaped berm, visual impacts of the proposed project would be somewhat beneficial as seen from KOP 2. However, timely resolution of tree survival issues is critical to achieving mitigation under previous and current conditions of certification.

KOP 4 - Vista del Mar - Manhattan Beach (Northbound)

Visual Resources Figure 11A depicts the view of motorists and residents looking toward the project site from Vista del Mar in Manhattan Beach at foreground distance (approximately ½ mile). From this portion of Vista del Mar, views of the power plant are visually subordinate to co-dominant, seen through a narrow view corridor framed by low-rise residential development on each side. At 45th Street, views of the plant become dominant in the viewer's immediate foreground.

Visual Quality – Moderate. Visual quality from this viewing area is generally moderate, typified by medium density residential structures with little or no street-front landscaping and limited scenic views, but also including some views of the Santa Monica Bay and Mountains.

Viewer Concern – Moderately high. Viewer concern is considered moderately high due to the combination of recreationists, tourists, and residents with higher viewer concern, with commuters and others with lower levels of viewer concern.

Viewer Exposure – Moderately high. Viewer exposure to the plant increases from moderate to high as one approaches the plant. Near-distance views of the existing Units 3 and 4 power block are highly prominent, looming above the roadway and strongly sky-lined against a background of bay and mountains at the horizon.

Overall visual sensitivity is thus considered moderately high.

Visual Resources Figure 11B presents a visual simulation of the proposed project as viewed from KOP 4.

Visual Contrast: The contrast of the ESGS with the surrounding setting, particularly in views toward the bay, would be reduced dramatically by the

elimination of the massive existing Units 3 and 4 power block and their replacement with the lower and much smaller Units 9 – 12.

Project Dominance*:* Visual dominance of the ESGS facility would be reduced dramatically from KOP 3 by the elimination of the existing Units 3 and 4 power block, which currently dominates these views. Although the new exhaust stacks would remain visible and prominent, looming views of the existing power block would be replaced by open views of the bay.

View Blockage: Existing blockage of views to the bay by the existing power block, which is severe, would be largely eliminated by its replacement with the proposed ESPFM units. The much lower, spatially separated units would greatly increase available views to the bay.

Overall Visual Change: Overall contrast, dominance and view blockage of views from KOP 3 would be reduced substantially by elimination of Units 3 and 4 under the proposed ESPFM project.

Visual Impact Significance: Visual impacts of the proposed project from KOP 3 would be beneficial.

Mitigation: None needed.

KOP 5 - Vista del Mar – El Segundo (Southbound)

Visual Resources Figure 12A depicts the view toward the ESEC project from Vista del Mar, immediately adjacent to the ESGS site, southbound. For southbound motorists on Vista del Mar, views of the existing ESEC Units 5 - 8 become highly dominant from a distance of roughly 1/2 mile. However, the existing ESEC exhaust stacks and HRSGs are a prominent feature of the El Segundo/Vista del Mar landscape for southbound motorists from over 1.5 miles or more to the north, as depicted in **Visual Resources Figure 3**.

Visual Quality – Moderate. Within the immediate roadway foreground 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 perimeter to the east contributes to moderately high scenic quality. On the other, the existing views of the plant itself, including power blocks, HRSGs, exhaust stacks, and 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 visual quality was considered to be moderate.

Viewer Concern – Moderately high. High numbers of motorists passing the site include a combination of tourists and recreationists with high scenic expectations, together with commuters, workers and others who would be expected to have lower levels of scenic expectation and concern.

Viewer Exposure – Moderately high. Visibility of the existing Units 5 - 8 is high, due to the height and prominence of the existing HRSGs and exhaust stacks above the

level of the roadway in the immediate foreground. Recently planted landscape screening in this portion of roadway will help considerably in filtering views of the existing and proposed units in the future, reducing viewer exposure with greater maturity. Older existing landscaping near the site perimeter also contribute to visual filtering of the plant from Vista del Mar, improving the quality of views in this segment of road.

Very high numbers of motorists see the ESGS facilities from the roadway at very close distances, but the duration of exposure within the 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 considered moderately high.

Visual Resources Figure 12B depicts a visual simulation of the proposed project from KOP 5.

Visual Contrast: The contrast of the ESGS with the surrounding setting, particularly in views toward the bay, would be reduced dramatically by the elimination of the massive existing Units 3 and 4 power block and their replacement with the lower and much smaller Units 9 – 12.

Project Dominance*:* Visual dominance of the project facility would be reduced dramatically from KOP 5 by the elimination of the existing Units 3 and 4 power block, which currently dominates these views. Although the new exhaust stacks would remain visible and prominent, looming views of the existing power block would be replaced by open views of the bay.

View Blockage: Existing blockage of views to the bay by the existing Units 3 and 4 power block, which is severe, would be largely eliminated by its replacement with the proposed ESEC units. The much lower, spatially separated units would greatly increase available views to the bay. Intrusion into scenic bay views by Units 5 – 8, and by the exhaust stacks of Units 9 – 12, would remain strong and prominent.

Overall Visual Change: Overall contrast, dominance and view blockage of views from KOP 5, though still strong, would be reduced substantially by elimination of Units 3 and 4 under the proposed ESPFM project.

Visual Impact Significance: Visual impacts of the proposed project from KOP 5 would be beneficial.

Mitigation: None needed

KOP 6 – 45th Street, Manhattan Beach Residences

Visual Resources Figure 13A depicts the view from residences on 45th Street and The Strand, Manhattan Beach (El Porto) looking north toward the ESGS site. Potential sensitive receptors within this portion of the viewshed include residents of

homes in the city of Manhattan Beach along 45th Street or The Strand (views from homes further south are largely blocked by intervening structures). While views of the ESEC from the vicinity of 45th Street are largely screened by the intervening landscaped berm, residents of 45th Street could have very prominent views of laydown and construction activities at the former tank farm site.

Visual Quality – High. Views of the bay are visible from most residences exposed to views of this portion of the ESEC site. The mechanical/industrial features of the power plant are largely screened from view due to the landscaped berm on 45th Street.

Viewer Concern – High. Viewer concern of residents is typically considered high.

Viewer Exposure – Moderately high. Visibility and exposure to the ESEC project site would be low, but to the tank farm laydown site, moderately high.

Overall visual sensitivity is thus considered high.

Visual Resources Figure 13B depicts a visual simulation of the proposed project from KOP 10.

Visual Contrast: As depicted in **VISUAL RESOURCES Figure 13B,** ESEC project contrast would be low. It is not clear why the existing Units 3 and 4 exhaust stacks are visible in this view, but the proposed Units 9, 10, and 11 as depicted would not be, since they are of similar height and in similar locations. Nevertheless, even if these stacks would be visible in these views, the level of contrast would remain moderately low. However, temporary contrast of large equipment or material staging could in the worst cases be moderately high.

Project Dominance*:* As depicted, visual dominance of the ESEC units would be low. However, dominance of large equipment staging could be moderate.

View Blockage: As depicted, view blockage of the ESEC units from this KOP would be negligible. Equipment staging at the tank farm site would not block views of the bay and would thus also be negligible.

Overall Visual Change: Overall long-term visual change from the project would be negligible. However, short-term visual change from staging and laydown could be moderate.

Visual Impact Significance: Long-term impact significance of the project would be negligible. However, temporary construction laydown impacts could potentially be significant.

Mitigation: A key part of the visual effect of the ESEC facility from this area depends upon the landscaped berm and associated plantings required under conditions of the prior project proceedings. Staff has observed that these recent

plantings have experienced some survival issues. Measures for further study and replanting on the berm have thus been added to Condition of Certification **VIS-9.**

In addition, to further address potential impacts of project staging/laydown at the tank farm site, a new Visual Resources Condition of Certification **VIS-10** is recommended.

Residual Impact Significance After Mitigation. With success of plantings on the landscaped berm, long-term visual effects of the ESEC project would be beneficial.

In addition, with new Visual Resources Condition of Certification **VIS-10,** though potential temporary impacts of construction would not be eliminated, they could be reduced to acceptable, less-than-significant levels.

Visual Resources Table 2
KOP Ratings: Visual Sensitivity/Visual Change and
Impact Significance under CEQA Criterion C

KOP No.	VISUAL SENSITIVITY (Existing Condition)						
			Viewer Exposure				
	Visual Quality	Viewer Concern	Visibility	No. of Viewers	Duration of View	Overall Viewer Exposure	Overall Visual Sensitivity
1	Moderately high	High	Mod. low	High	Moderate	Moderately low	Moderately high
2	Moderately high	High	High	High	Moderate	High	High
3	High	High	Moderate	High	Moderate	Moderate	Moderately high
4	Moderate	Moderately high	Mod. high	High	Moderate	Moderately high	Moderately high
5	Moderate	Moderately high	High	High	Mod. low	Moderately high	Moderately high
6	High	High	Mod. High (Tank farm)	Moderate (Tank farm)	High (Tank farm)	Moderately high (Tank farm)	High (Tank farm)

KOP No.	VISUAL CHANGE (Project effect in relation to CEQA baseline)			
	Contrast	Dominance	View Blockage	Overall Visual Change
1	Low (reduced)	Low (reduced)	Low	Low
2	Low (reduced)	Low (reduced)	Low	Moderately beneficial
3	Low(reduced)	Low (reduced)	Low	Moderately beneficial
4	Low (reduced)	Low (reduced)	High	Moderately beneficial
5	Low (reduced)	Low (reduced)	Low (reduced)	Beneficial

6	Low (reduced) Tank farm staging: Moderately high	Low (reduced) Tank farm staging: Moderate	None Tank farm staging: Negligible	Moderately beneficial Tank farm staging: Moderate

KOP No.	**KOP VISUAL IMPACT SIGNIFICANCE DETERMINATION – (CEQA Criterion C)**			
	Overall Visual Sensitivity	**Overall Visual Change**	**Visual Impact Significance**	**Mitigation (See Staff Proposed KOP Visual Mitigation Measures)**
1	Moderately high	Low	Less than Significant	VIS-5
2	Moderately high	Mod. beneficial	Beneficial	VIS-5
3	Moderately high	Mod. beneficial	Beneficial	VIS-2
4	Moderately high	Mod. beneficial	Beneficial	None
5	Moderately high	Beneficial	Beneficial	None
6	Moderately high	Project: Mod. Beneficial Tank farm staging: Moderate	Project: Beneficial Tank farm staging: Potentially significant With all conditions: Less than significant	VIS-9 and VIS-10 (To address construction impacts)

Water Vapor Plumes

Staff employs a threshold for significant visible vapor plumes of 20 percent of seasonal daylight clear hours. Visible vapor plumes occurring more frequently than this threshold are considered to represent potentially significant visual impacts and subjected to further modeling to determine visible plume size as well as frequency. Staff modeled the GE turbine/HRSG plumes using the Combustion Stack Visible Plume (CSVP) model with a six-year (1990-1995) LAX meteorological data set obtained from the National Climatic Data Center. This analysis determined that frequency of visible plumes from the GE turbine/HRSG (Unit 9) would be nil (0 percent) and from the Trent turbine (Unit's 11 and 12) also to be nil. The proposed auxiliary boiler would have a visible plume frequency of 0.3 percent under 25percent load conditions, and 0.1percentunder full load. The potential for adverse visual impact from visible vapor plumes of the proposed units is thus predicted to be virtually nil (Wenjun 2013).

D. Light And Glare

"Would the project create a new source of substantial light or glare that would adversely affect daytime or nighttime views in the area?"

No. With recommended Conditions of Certification **VIS-6** and **VIS-8**, both permanent operational lighting and temporary construction lighting associated with the proposed units would be hooded and shielded, directed downward and restricted to within the boundaries of the ESGS site. Consistent with safety requirements, lighting would be of minimum necessary brightness and kept off when not in use and employ motion detectors. A lighting complaint resolution form would be kept to document and report all lighting complaints received, and included in the project Annual Compliance Report.

CUMULATIVE IMPACTS AND MITIGATION

A project may result in a significant adverse cumulative impact where its effects are cumulatively considerable. "Cumulatively considerable" means that the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects (Cal. Code Regs., tit. 14, § 15130).

Cumulative impacts to visual resources may occur where project facilities occupy the same field of view as other built facilities or impacted landscapes, and an adverse change in the visible landscape character is perceived. In some cases, a cumulative impact could also occur if a viewer perceives that the general visual quality or landscape character of a localized area is diminished by a proliferation of visible structures or construction effects, even if the changes are not within the same field of view as existing (or future) structures or facilities. The result is a perceived “industrialization” of the existing landscape character.

Past cumulative projects are relevant to the extent that they contribute to potential cumulative impacts of the proposed project, when considered with pending and future projects. In the present case, the numerous past industrial facilities in the ESGS’s coastal viewshed, including the Chevron refinery, Scattergood Power Plant, and Hyperion Wastewater Treatment facility, with the ESGS, have cumulatively created a landscape strongly and adversely influenced by these large-scale industrial facilities. The coastal strip between Imperial Highway to the north and 45th Avenue in Manhattan Beach has historically been dominated and visually degraded by these industrial uses. On the other hand, each of these past industrial projects has implemented substantial measures to screen and reduce their industrial character as seen by the public. These measures have included architectural enclosures and facades over mechanical equipment, landscaped berms, and extensive landscape plantings. These measures have substantially improved the Vista del Mar viewshed, reducing the overall industrial character. These measures now include the various visual mitigation and enhancement measures implemented as part of the past project proceedings.

The proposed ESPFM Units 9 – 12 project would be visible within the same viewshed as projects 1 and 4 of the project’s Cumulative Projects list as identified in the **Executive Summary** of the Final Staff Assessment. These projects are: 1) ESEC Units 5 – 8 (existing); and 4) proposed construction of 4 new generation units at the LADWP Scattergood Generating Station, located approximately ½- mile north of the ESGS.

The proposed ESPFM amendment would contribute to the highly industrial visual presence of the previous, adjacent ESEC Units 5 – 8. Despite Conditions of Certification for those prior units, they remain a highly prominent, highly industrial feature of the coastal viewshed.

The existing Scattergood plant is also a highly prominent feature in the Vista del Mar viewshed to the north of the ESGS, and is prominently visible together with the project site facilities in views from Vista del Mar. The existing cumulative visual effect of the Scattergood and the project's facilities is greatly moderated, however, by the architectural enclosure and screening of mechanical equipment at the Scattergood plant, which appears as a simple large building rather than a visually cluttered collection of mechanical equipment.

The potential cumulative impact associated with ESEC and the proposed modification of the Scattergood plant would thus depend upon the design of the Scattergood modifications. If the proposed new Scattergood units employ an architecturally enclosed design similar to the existing facility, their adverse visual effects could be minimized. The incremental visual effects of the new ESPFM units would also be minimal or beneficial, as discussed previously. Thus, the cumulative impacts of the two projects together could also be minor or negligible. If however the replacement units at Scattergood were to be unscreened or otherwise result in adverse visual impacts to the Vista del Mar viewshed, then the overall condition of that viewshed could potentially decline substantially. In such a situation, significant adverse cumulative visual impacts could occur between the existing ESEC Units 5 – 8, the proposed ESPFM Units 9 – 12, and the proposed new Scattergood units. Under such a scenario the contribution of the proposed ESPFM Units 9 – 12 would be cumulatively considerable.

COMPLIANCE WITH APPLICABLE LORS

The proposed project would be subject to the LORS of the CCC and city of El Segundo. Compliance with these LORS is summarized in **Visual Resources Table 3.**

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Visual Resources Table 3
Laws, Ordinances, Regulations and Standards

Applicable LORS	Description	Consistency (assumes implementation of staff-recommended conditions of certification)
Federal		
None		
State		
California Coastal Act	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)	Consistent. Conditions of Certification **VIS-2, VIS-5, VIS-6, VIS-8, and VIS-10** comprise a collection of feasible visual mitigation and enhancement measures to rehabilitate the degraded visual condition of the ESGS site. While the visual degradation of the coastal zone has not been completely eliminated and restored, substantial improvements have or will be made, and identified feasible measures have been applied.
Local		
City of El Segundo Coastal Zone Specific Plan/Local Coastal Program	***Policy LU5-2.1.*** New industrial developments shall provide landscaping in parking areas and around the buildings. This landscaping is to be permanently maintained.	Consistent. The landscape plan implemented by the applicant subsequent to the 2010 Committee Decision includes enhanced perimeter landscape treatments on three boundaries of the ESGS, which are to be permanently maintained.
	Policy LU5-2.2. All outdoor storage shall be properly screened by masonry walls and landscaping.	Consistent. With Conditions of Certification **VIS-2, VIS-9** and **VIS-10**, outdoor storage and staging would be screened by a combination of fencing 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.	Consistent. Conditions of Certification **VIS-2, VIS-5, VIS-6, VIS-8, and VIS-10** comprise a collection of feasible mitigation and enhancement measures to rehabilitate the degraded visual condition of the ESGS site.

NOTEWORTHY PUBLIC BENEFITS

The proposed ESPFM would result in beneficial visual impacts at several public view locations due to the overall reduced profile, footprint and scale of the new units compared to the existing ESGS Units 3 and 4.

RESPONSE TO AGENCY AND PUBLIC COMMENTS

Comments from Michelle Murphy:

Commenter Michelle Murphy expressed concern both at the April 22, 2014 Preliminary Staff Assessment workshop, and in written comments, about the poor current condition of the new landscaping installed previously as required by conditions of certification approved under the 2010 Commission Decision and prior proceedings. Staff is well aware of the survival and implementation issues that have occurred, and have been involved in an on-going effort to resolve these issues. The CPM, biological and visual resources staff have consulted with the project owner, local nurseries and others to develop recommendations and plan modifications to address these issues. It is anticipated that these implementation problems will be resolved. Staff will also consult with the Coastal Commission and the cities of El Segundo and Manhattan Beach for input on future modifications and improvements to the landscape plan.

Michelle Murphy also commented at the April 22, 2014 workshop that she didn't know how the existing stacks came to be painted blue and wondered if it was possible to consider an artistic treatment for the new stacks such as a Hawaiian shirt pattern or something like the Wyland whales seen on water tanks in the region. Staff explained that the blue was settled on in a prior amendment and addressed in VIS-5, Surface Color Treatment of Structures. It should be noted that VIS-5 remains as a condition of certification in this current amendment.

Comments from the Project Owner:

Project owner proposed changes in wording to Conditions of Certification **VIS-2** and **VIS-10**, referencing on-going implementation of previously approved conditions as applied under the 2010 Commission Decision. The proposed changes would not alter the meaning or requirements of the conditions in any way, so the proposed changes have been included in the text of the Final Staff Assessment, as modified below.

CONCLUSIONS

As discussed in the preceding analysis, the amended ESEC project is not expected to result in significant adverse impacts in relation to the existing CEQA baseline condition, because of the already degraded condition of the site and viewshed.

Instead, the principal visual issues of the project revolve around LORS conformance with the California Coastal Act. As in prior project proceedings, staff found, and the California Coastal Commission (CCC) concurred, that the project setting was "visually degraded, due in large part to the presence of the [existing] facility," pursuant to Section 30251 of the Coastal Act. Section 30251 requires permitted developments ". . . where feasible, to restore and enhance visual quality in visually degraded areas." The CCC recommended that specific provisions, described in Condition of Certification **VIS-1**, be implemented if the original project was certified, pursuant to Section 25523(b) of the Warren-Alquist Act and Section 30413(e) of the Coastal Act. These provisions called for the enhancement of views of the facility from areas accessible to the public. These and

associated Conditions of Certification **VIS-2** through **VIS-9** have largely been implemented. Staff recommends that Conditions of Certification VIS-2, VIS-5, VIS-6 and VIS-8, as modified herein, be carried forward to the current proceeding. Although the condition of the project site and viewshed would remain 'visually degraded' even with complete implementation of these measures, all identified feasible mitigation measures have been applied, and substantial visual improvements are anticipated over the long term. Staff thus finds that the proposed project with all recommended conditions conforms with applicable LORS.

Staff further notes that significant cumulative visual impacts could potentially be anticipated if the proposed and foreseeable replacement of generation units at the LADWP Scattergood Plant should result in adverse visual impacts in the coastal viewshed of Dockweiler Beach and Vista del Mar.

CONDITIONS OF CERTIFICATION

All Conditions of Certification shall remain the same as approved in the 2010 Commission Decision, except as modified below. The Energy Commission should adopt all of the conditions of certification previously applied to the project in the 2010 Decision, as modified, if it approves the amended project. Staff has proposed modifications to the conditions of certification as shown below. (Note: New text is **bold and underlined**. Deleted text is in ~~strikethrough~~.)

~~**VIS-1 Facility Visual Enhancement Plan.** Before starting construction, the project owner shall complete a comprehensive visual enhancement plan that includes 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:~~

~~Landscaping: Where used to screen the facility, vegetation shall be selected and 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 (e.g.,seacliff buckwheat), or at a minimum, non-invasive species. To help native plant species succeed where efforts are made to establish them, non-native and aggressive ice plant should be removed to prevent it from out competing native dune vegetation due to its dense character and vigorous growth. Soils shall be tested, amended as needed or replaced to ensure plant survival.~~

~~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 and 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, the City of Manhattan Beach, and the City of El Segundo, and review and approval by the CPM. 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 ground disturbance, 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 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 Coastal Commission staff, the Cities, and CPM a revised submittal.~~

VIS-2 Perimeter screening and on-site landscaping. The project owner shall ~~prepare~~ **continue with implementation of the**~~ and implement an approved~~ perimeter screening and on-site landscape plan **developed and approved in compliance with the Conditions of Certification applied to the 2010 Decision, as modified. Modifications shall include those recommended by the Compliance Project Manager (CPM) in consultation with the staff of the Coastal Commission and the cities of Manhattan Beach and El Segundo.**

~~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 proposed 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 power plant units 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)~~ **1)The project owner shall ensure survival of and effective screening by tree and other landscape plantings and maintain a**~~A~~ procedure for monitoring and replacement of all unsuccessful plantings for the life of the project, **including monitoring and replacement of pre-existing perimeter landscape plantings.**

The project owner shall consult with the CPM to modify the perimeter landscape plan as needed to replace unsuccessful plantings, adjust the plantings on the top of the berm to preserve the views of residences toward the ocean and the Santa Monica Mountains, .

~~7)~~ **2)** A chart and key plan showing conformance with City of El Segundo landscape regulations.

~~8)~~ **3)** Soil tests shall be performed on both on-site and imported soil and where landscaping is to take place. Soil shall be amended on the basis of those tests if needed to ensure long-term viability of plantings.

~~9)~~ **4) upgrade the condition and appearance of existing chain link fencing along the Braude bike path with green coated fencing.**

~~The property owner shall meet the city of El Segundo's requirements for Vehicle Use Area (VUA) landscaping in the tank farm area by providing the required trees on the existing containment berm and other areas immediately adjacent to the portion of the tank farm area to be used for staging, not including the area to be striped for vehicle parking.~~

~~The landscaping plan shall be consistent with the Landscape Concept Plan presented at Evidentiary Hearings, with modifications for VUA landscaping, revisions to depict the 45th Street landscape berm, and modifications to accord with item #2 above.~~

The project owner shall not implement the plan **or revisions to 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 CPM for review and approval, in consultation with **staff of** the Coastal Commission and the Cities of El Segundo and Manhattan Beach. 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 **revisions to the** landscape plan **within 90 days of CPM approval**.

The project owner shall notify the CPM within seven days after completing installation of the **revisions to 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, consistent with the Landscape Concept Plan, to the Executive Director of 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 Executive Director of 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 Deleted.**~~

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~~ 9 through 12 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. **Major project structures and appurtenances, excluding the exhaust stacks and administration building, shall be painted blue to match the coloring of existing Units 5 through 8. The stacks shall be painted with an approved FAA white finish to match the existing stacks. Color treatment for the administration building shall be determined once final architectural drawings are submitted to the CPM for review and approval**

Prior to the start of construction, the project owner shall submit to the CPM for review and approval (in consultation with the Coastal Commission and the cities of El Segundo and Manhattan Beach) 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~~**9 through 12**, 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, including administration office interior lighting, shall be kept off when not in use;

d) Design of administration office shall include use of darkened glass to minimize visibility of nighttime interior lighting to public view; and

e) 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, particularly in Manhattan Beach, after demolition of Units 3 and 4; 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 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. Monday through Friday and 9:00 a.m. to 6:00 p.m. Saturday, 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 City of Manhattan Beach and 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. Soils shall be tested, amended as needed or replaced to ensure plant survival. 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 Executive Director of 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 an all-inclusive list of proposed tree, plant, 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 plant species that would be viable and non-invasive 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 for the entire project site, including any needed irrigation and a plan for routine and regular debris removal as needed to preserve a neat and well-maintained appearance, 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 representatives of California Exotic Pest Plant Council, the Executive Director of 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 45th Street berm that the berm is ready for inspection. 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 report landscape maintenance activities, including replacement of dead vegetation, for the previous month of construction in the Monthly Compliance Report.~~

VIS-10 Screening of On- and Off-Site Construction and Laydown Sites. Prior to the start of commercial operation, the project owner shall design and install continuous new opaque perimeter fencing around all proposed construction and laydown sites within the coastal zone, including the Units 3 and 4 portion of the ESGS site facing the beach, and the former tank farm site facing the beach or 45th Avenue. Fencing shall be of sufficient height and extent to minimize the visibility of stored equipment and materials as seen by off-site public viewers. Opaque fencing material shall be maintained and, where damaged or worn, replaced in a timely manner.

Fencing plans shall be prepared for all construction, staging and laydown sites in the coastal zone where construction or staging could be visible from public beaches or roadways. In determining the need for the

construction fencing, account should be taken of the screening effects of berms and landscaping installed in compliance with the Conditions of Certification applied to the 2010 Decision as modified.

Prior to start of demolition or laydown activities, project owner shall submit a temporary perimeter fencing plan to the CPM for review and approval. The plan shall provide:

a) A detailed fencing plan at a reasonable scale showing proposed fence locations, fencing types and heights, and fencing details.

b) A detailed schedule for completion of the installation.

c) A procedure for monitoring and replacement of damaged or worn fencing.

Verification: At least 60 days prior to start of ground disturbance, the project owner shall submit the temporary perimeter fencing plan to the CPM for review and approval. If the CPM notifies the project owner that revisions of the submittal are needed before the CPM will approve the submittal, 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 fencing plan that the fencing is ready for inspection.

The project owner shall report fencing maintenance activities, including replacement of damaged or worn fencing, for the previous month of construction in the monthly compliance report.

REFERENCES

California Coastal Commission (CCC). 2002a.CEC 2002a-CEC 2010a-NRG 2013aCoastal Commission Visual Findings on AFC-POS. Submitted to the California Energy Commission on March 6, 2002.

CEC (TN 26655). Final Staff Assessment – El Segundo Redevelopment Project, dated 9/2002.

CEC (CEC-800-2010-015). El Segundo Power Redevelopment Project Amendment Commission Decision, dated 6/2010.

NRG / El Segundo Energy Center LLC (TN 70442) Petition to Amend, dated April 2013. Submitted to CEC on 04/23/2013.

City of El Segundo (COES), 1980.City of Manhattan Beach (COMB).-Coastal Zone Specific Plan/Local Coastal Program. 1988. General Plan.

APPENDIX VR-1

ENERGY COMMISSION VISUAL RESOURCE ANALYSIS EVALUATION CRITERIA

Energy Commission staff conducts a visual resource analysis according to Appendix G, "Environmental Checklist Form—Aesthetics," California Environmental Quality Act (CEQA). The CEQA analysis requires that commission staff make a determination of impact ranging from "Adverse and Significant" to "Not Significant."

Staff's analysis is based on Key Observation Points or KOPs. KOPs are photographs of locations within the project area that are highly visible to the public—for example, travel routes; recreational and residential areas; and bodies of water as well as other scenic and historic resources.

Those photographs are taken to indicate existing conditions without the project and then modified to include a simulation of the project. Consequently, staff has a visual representation of the viewshed before and after a project is introduced and makes its analysis accordingly. Information about that analytical process follows.

VISUAL RESOURCE ANALYSIS WITHOUT PROJECT

When analyzing KOPs of existing conditions without the project, staff considers the following conditions: visual quality, viewer concern, visibility, number of viewers, duration of view. Those conditions are then factored into an overall rating of viewer exposure and viewer sensitivity. Information about each condition and rating follows.

Visual Quality

An expression of the visual impression or appeal of a given landscape and the associated public value attributed to the resource. Visual quality is rated from *high* to *low*. A high rating is generally reserved for landscapes viewers might describe as picture-perfect.

Landscapes rated high generally are memorable because of the way the components combine in a visual pattern. In addition, those landscapes are free from encroaching elements, thus retaining their visual integrity. Finally, landscapes with high visual quality are visually coherent and harmonious when each element is considered as part of the whole. On the contrary, landscapes rated *low* are often dominated by visually discordant human alterations.

Viewer Concern

Viewer concern represents the reaction of a viewer to visible changes in the viewshed an area of land visible from a fixed vantage point. For example, viewers have a high expectation for views formally designated as a scenic area or travel corridor as well as for recreational and residential areas. Viewers generally expect that those views would be preserved. Travelers on highways and roads, including those in agricultural areas, are generally considered to have moderate viewer concerns and expectations.

However, viewers tend to have low-to-moderate viewer concern when viewing commercial buildings. And industrial uses typically have the lowest viewer concern. Regardless, the level of concern could be lower if the existing landscape contains discordant elements. In addition, some areas of lower visual quality and degraded visual character may contain particular views of substantially higher visual quality or interest to the public.

Visibility

Visibility is a measure of how well an object can be seen. Visibility depends on the angle or direction of views; extent of visual screening; and topographical relationships between the object and existing homes, streets, or parks. In that sense, visibility is determined by considering any and all obstructions that may be in the sightline—trees and other vegetation; buildings; transmission poles or towers; general air quality conditions such as haze; and general weather conditions such as fog.

Number of Viewers

Number of viewers is a measure of the number of viewers per day who would have a view of the proposed project. *Number of viewers* is organized into the following categories: residential according to the number of residences; motorist according to the number of vehicles; and recreationists.

Duration of View

Duration of view is the amount of time to view the site. For example, a high or extended view of a project site is one reached across a distance in two minutes or longer. In contrast, a low or brief duration of view is reached in a short amount of time—generally less than ten seconds.

Viewer Exposure

Viewer exposure is a function of three elements previously listed, *visibility*, *number of viewers*, and *duration of view*. Viewer exposure can range from a *low* to *high*. A partially obscured and brief background view for a few motorists represents a low value; and unobstructed foreground view from a large number of residences represents a high value.

Visual Sensitivity

Visual sensitivity is comprised of three elements previous listed, *visual quality*, *viewer concern*, and *viewer exposure*. Viewer sensitivity tends to be higher for homeowners or people driving for pleasure or engaged in recreational activities and lower for people driving to and from work or as part of their work.

Visual Resource Analysis with Project

Visual resource analyses with photographic simulations of the project involve the elements of contrast, dominance, view disruption, and visual change. Information about each element follows.

Contrast

Contrast concerns the degree to which a project's visual characteristics or elements — form, line, color, and texture — differ from the same visual elements in the existing landscape. The degree of contrast can range from *low* to *high*. A landscape with forms, lines, colors, and textures similar to those of a proposed energy facility is more visually absorbent; that is, more capable of accepting those characteristics than a landscape in which those elements are absent. Generally, visual absorption is inversely proportional to visual contrast.

Dominance

Dominance is a measure of (a) the proportion of the total field of view occupied by the field; (b) a feature's apparent size relative to other visible landscape features; and (c) the conspicuousness of the feature due to its location in the view.

A feature's level of dominance is lower in a panoramic setting than in an enclosed setting with a focus on the feature itself. A feature's level of dominance is higher if it is (1) near the center of the view; (2) elevated relative to the viewer; or (3) has the sky as a backdrop. As the distance between a viewer and a feature increases, its apparent size decreases; and consequently, its dominance decreases. The level of dominance ranges from *low* to *high*.

View Disruption

The extent to which any previously visible landscape features are blocked from view constitutes view disruption. The view is also disrupted when the continuity of the view is interrupted. When considering a project's features, higher quality landscape features can be disrupted by lower quality project features, thus resulting in adverse visual impacts. The degree of view disruption can range from *none* too *high*.

Visual Change

Visual change is a function of *contrast*, *dominance*, and *view disruption*. Generally, *contrast* and *dominance* contribute more to the degree of visual change than does *view disruption*.

APPENDIX VR-2
Coastal Commission Letter

CALIFORNIA COASTAL COMMISSION
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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 Plan[1]: 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 - FIGURE 1

El Segundo Power Project Amendment - Project Site

Units 3 and 4 power block, Units 5 – 8 stacks, from Vista del Mar, Manhattan Beach looking northwest.

Units 3 and 4 powerblock, Units 5 – 8, from Vista del Mar, El Segundo. looking west toward Santa Monica Bay.

Units 3 and 4 powerblock from bike path, looking north.

Seawall along bike path west of ESGS site.

CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCE: William Kanemoto & Associates

VISUAL RESOURCES - FIGURE 2
El Segundo Power Project Amendment - Project Viewshed and KOPs

Project Viewshed
(Visible area, from 210' top of stack)

No Scale.

Viewshed in Manhattan Beach has been adjusted to account for view blockage by intervening structures.

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SOURCE: William Kanemoto & Associates

VISUAL RESOURCES - FIGURE 3

El Segundo Power Project Amendment - Industrial Facilities in Project Viewshed

LADWP Scattergood Plant looking south from Vista del Mar. ESGS/ESEC is visible to the right.

Hyperion Wastewater Treatment Plant from Vista del Mar.

ESEC Units 5 – 8 from Vista del Mar.

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SOURCE: William Kanemoto & Associates

VISUAL RESOURCES - FIGURE 4

El Segundo Power Project Amendment - Views of Project Site from Beaches

ESEC Units 5 – 8 in foreground, ESGS Units 3 and 4 (proposed project site) from Dockweiler State Beach, looking south.

Wide-angle view of 45th Street landscaped berm, ESGS Units 3 and 4 powerblock from Manhattan State Beach, looking north.

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SOURCE: William Kanemoto & Associates

VISUAL RESOURCES - FIGURE 5

El Segundo Power Project Amendment - Views of Site from Manhattan Beach Residences

45th Street landscaped berm from Strand residences, looking north.

Strand residences adjoining ESGS, former tank farm site.

View of landscaped berm from 45th Street residences, looking west.

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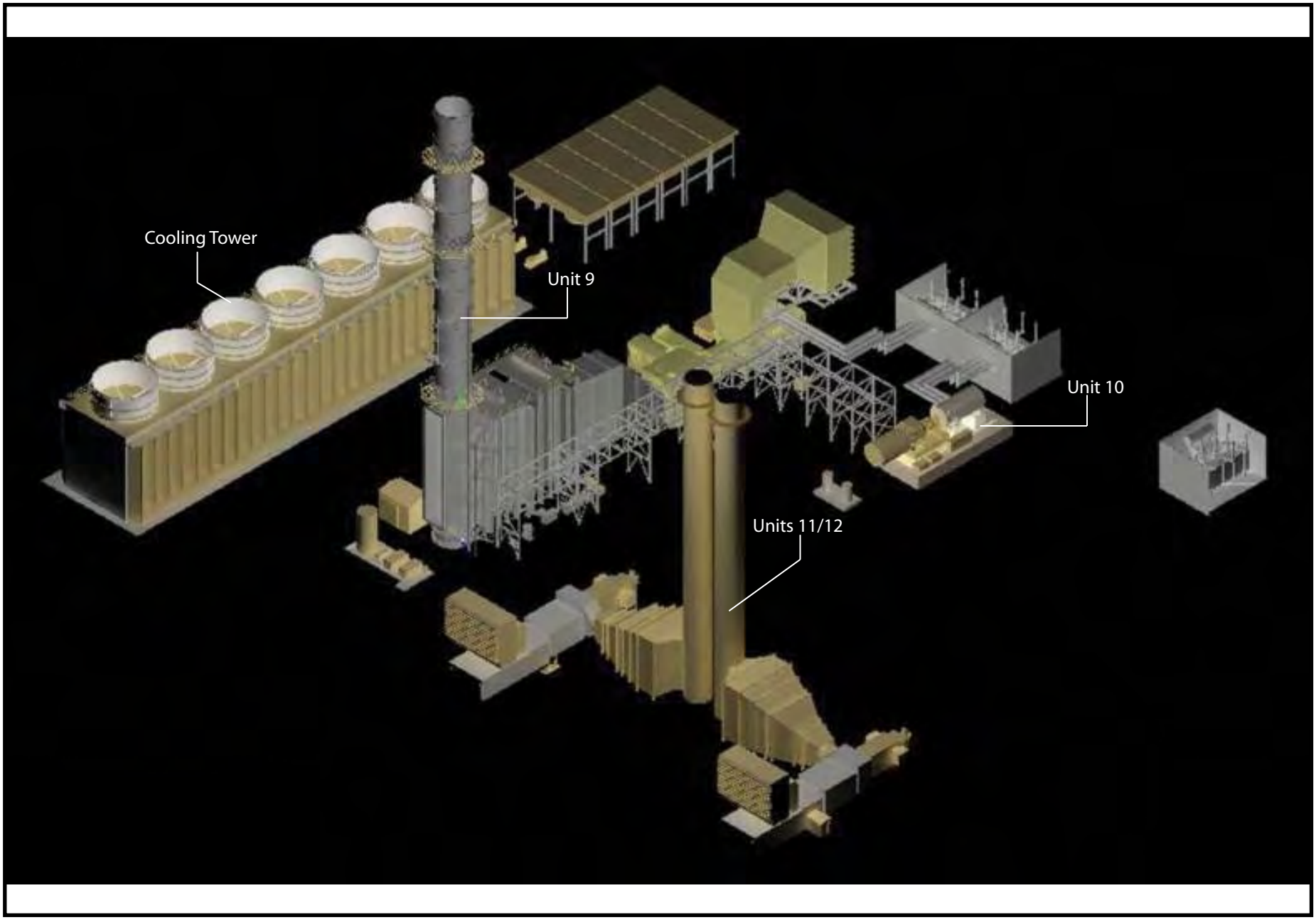
SOURCE: William Kanemoto & Associates

VISUAL RESOURCES - FIGURE 6

El Segundo Power Project Amendment - Schematic Isometric View, Proposed Units 9 - 12



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SOURCE: 3-D El Segundo Power, Fig. DR1-1, NRG

VISUAL RESOURCES - FIGURE 7

El Segundo Power Project Amendment - Simulated View of Proposed Administration Building

CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCE:

VISUAL RESOURCES - FIGURE 8

El Segundo Power Project Amendment - KOP 1 - Dockweiler State Beach Looking South

A. View looking south-southeast toward ESGS from Dockweiler Beach State Park in El Segundo.
ESGS is visible in the center of the view, and Manhattan Beach is visible.

B. View from KOP 1 showing ESPFM. Landscaping is shown as it would appear 5 years after installation.
ESGS is visible in the center of the view, and Manhattan Beach is visible.

CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCE: April 2013 Petition to Amend 00-AFC-14

VISUAL RESOURCES - FIGURE 9

El Segundo Power Project Amendment - KOP Point 2 - Dockweiler State Beach Looking Southeast

A. View to the southeast toward ESGS from a jetty along Dockweiler Beach in El Segundo. The southern and central portions of ESGS are visible in this view, with the Chevron El Segundo Refinery and City of Manhattan Beach visible as backdrop. Landscaping required as part of existing COCs for 00-AFC-14 is shown as it would appear 1 year after installation.

B. View from KOP 7 showing ESPFM. Landscaping is shown as it would appear 5 years after installation.

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SOURCE: April 2013 Petition to Amend 00-AFC-14

VISUAL RESOURCES - FIGURE 10

El Segundo Power Project Amendment - View from Key Observation Point 3

A. View looking north toward ESGS from Manhattan Beach State Park in Manhattan Beach. ESGS is visible in the center of the view. Landscaping required as part of existing COCs for 00-AFC-14 is shown as it would appear 1 year after installation and is concentrated along the southern and southwestern edge of the project site.

B. View from KOP 3 showing ESPFM. Landscaping is shown as it would appear 5 years after installation.

CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCE: April 2013 Petition to Amend 00-AFC-14

VISUAL RESOURCES - FIGURE 11

El Segundo Power Project Amendment - View from Key Observation Point 4

A. View to the north-northwest toward ESGS from Highland Avenue, in Manhattan Beach. ESGS is visible in the center of this view from within a residential portion of Manhattan Beach near 43rd Street. Landscaping required as part of existing COCs for 00-AFC-14 is shown as it would appear 1 year after installation.

B. View from KOP 4, showing ESPFM. Landscaping is shown as it would appear 5 years after installation.

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SOURCE: April 2013 Petition to Amend 00-AFC-14

VISUAL RESOURCES - FIGURE 12

El Segundo Power Project Amendment - View from Key Observation Point 5

A. View looking south-southeast toward ESGS from Vista Del Mar in El Segundo. El Segundo Energy Center is visible in the center of the view from the roadway that passes along the eastern edge of the ESEC site. Landscaping required as part of existing COCs for 00-AFC-14 is shown as it would appear 1 year after installation.

B. View from KOP 5 showing ESPFM. Landscaping is shown as it would appear 5 years after installation.

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SOURCE: April 2013 Petition to Amend 00-AFC-1

VISUAL RESOURCES - FIGURE 13

El Segundo Power Project Amendment - View from Key Observation Point 6

A. View looking north toward ESGS from The Strand, near 44th Street, in Manhattan Beach. Views toward the center of ESGS are mostly obstructed by the 45th Street berm and landscaping required as part of existing COCs for 00-AFC-14, shown as it would appear 1 year after installation.

B. View from KOP 6 showing ESPFM. Landscaping is shown as it would appear 5 years after installation.

CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCE: April 2013 Petition to Amend 00-AFC-14

WASTE MANAGEMENT

Testimony of Ellie Townsend-Hough

SUMMARY OF CONCLUSIONS

Management of the waste generated during demolition, construction, and operation of the El Segundo Power Facility Modification (ESPFM) would not result in any significant adverse impacts and would comply with applicable waste management laws, ordinances, regulations, and standards, if the measures proposed in the staff's analysis are implemented. The implementation of the current conditions of certification, including a modification to Condition of Certification **WASTE-8**, and the addition of Condition of Certification **WASTE-9** for the El Segundo Energy Center (ESEC), 00-AFC-14C, will continue to mitigate impacts to below significance for the decommissioning and demolition of Units 3 and 4, and the construction and operation of Units 9, 10, 11, and 12. Condition of Certification **WASTE-8** was modified to reflect South Coast Air Quality Management District's (SCAQMD) reporting requirements for the disposal of asbestos-containing materials in the South Coast air basin and Condition of Certification, **WASTE-9**, was added to mitigate any potential impact from the demolition of El Segundo Generating Station (ESGS) Units 3 and 4.

There are a number of Recognized Environmental Conditions (RECs) located on the project's parcel where the ESPFM would be constructed. The project owner has established programs in place to develop and implement remediation strategies and worker safety standards that would mitigate these conditions and protect the environment and ESEC personnel.

INTRODUCTION

This analysis investigates issues associated with wastes generated from the proposed demolition, construction, and operation of the ESPFM. 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 non-hazardous wastes. The technical scope of this analysis encompasses solid wastes existing on site and those to be generated during demolition, and facility construction and operation. Management and discharge of wastewater is addressed in the **Soil and Water Resources** section of this document. Additional information related to waste management may also be covered in the **Worker Safety/Fire Protection** and **Hazardous Materials Management** sections of this document.

Energy Commission staff's objectives in conducting this waste management analysis are to ensure that:

- the management of project wastes would be in compliance with all applicable laws, ordinances, regulations, and standards (LORS). Compliance with LORS ensures that wastes generated during the construction and operation of the proposed project would be managed in an environmentally safe manner.

- the disposal of project wastes would not result in significant adverse impacts to existing waste disposal facilities, or result in other waste-related significant adverse effects on the environment.
- upon project completion, the site is managed in such a way that project wastes and waste constituents would not pose a significant risk to humans or the environment.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS (LORS)

The following federal, state, and local environmental LORS have been established to ensure the safe and proper management of both solid and hazardous wastes in order to protect human health and the environment. Project compliance with the various LORS is a major component of staff's determination regarding the significance and acceptability of the ESPFM with respect to management of waste.

WASTE MANAGEMENT Table 1
Laws, Ordinances, Regulations, and Standards (LORS)

Applicable Law	Description
Federal	
Title 42, United States Code, §§ 6901, et seq. Solid Waste Disposal Act of 1965 (as amended and revised by the Resource Conservation and Recovery Act of 1976, et al.)	The Solid Waste Disposal Act, as amended and revised by the Resource Conservation and Recovery Act (RCRA) et al., establishes requirements for the management of solid wastes (including hazardous wastes), landfills, underground storage tanks, and certain medical wastes. The statute also addresses program administration, implementation, and delegation to states, enforcement provisions, and responsibilities, as well as research, training, and grant funding provisions. RCRA Subtitle C establishes provisions for the generation, storage, treatment, and disposal of hazardous waste, including requirements addressing: • generator record keeping practices that identify quantities of hazardous wastes generated and their disposition; • waste labeling practices and use of appropriate containers; • use of a manifest when transporting wastes; • submission of periodic reports to the United States Environmental Protection Agency (U.S. EPA) or other authorized agency; and • corrective action to remediate releases of hazardous waste and contamination associated with RCRA-regulated facilities. RCRA Subtitle D establishes provisions for the design and operation of solid waste landfills. RCRA is administered at the federal level by U.S. EPA and its 10 regional offices. The Pacific Southwest regional office (Region 9)

	implements U.S. EPA programs in California, Nevada, Arizona, and Hawaii.
Title 42, United States Code, §§ 9601, et seq. Comprehensive Environmental Response, Compensation and Liability Act	The Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), also known as Superfund, establishes authority and funding mechanisms for cleanup of uncontrolled or abandoned hazardous waste sites, as well as cleanup of accidents, spills, or emergency releases of pollutants and contaminants into the environment. Among other things, the statute addresses: • reporting requirements for releases of hazardous substances; • requirements for remedial action at closed or abandoned hazardous waste sites and brownfields; • liability of persons responsible for releases of hazardous substances or waste; and • requirements for property owners/potential buyers to conduct "all appropriate inquiries" into previous ownership and uses of the property to 1) determine if hazardous substances have been or may have been released at the site and 2) establish that the owner/buyer did not cause or contribute to the release. A Phase I Environmental Site Assessment is commonly used to satisfy CERCLA "all appropriate inquiries" requirements.
Title 40, Code of Federal Regulations (CFR), Subchapter I – Solid Wastes	These regulations were established by U.S. EPA to implement the provisions of the Solid Waste Disposal Act and RCRA (described above). Among other things, the regulations establish the criteria for classification of solid waste disposal facilities (landfills), hazardous waste characteristic criteria and regulatory thresholds, hazardous waste generator requirements, and requirements for management of used oil and universal wastes. • Part 246 addresses source separation for materials recovery guidelines. • Part 257 addresses the criteria for classification of solid waste disposal facilities and practices. • Part 258 addresses the criteria for municipal solid waste landfills. • Parts 260 through 279 address management of hazardous wastes, used oil, and universal wastes (i.e., batteries, mercury-containing equipment, and lamps). U.S. EPA implements the regulations at the federal level. However, California is an authorized state so the regulations are implemented by state agencies and authorized local agencies in lieu of U.S. EPA.
Title 49, CFR, Parts 172 and 173 Hazardous Materials Regulations	U.S. Department of Transportation established standards for transport of hazardous materials and hazardous wastes. The standards include requirements for labeling, packaging, and shipping of hazardous materials and hazardous wastes, as well as training requirements for personnel completing shipping papers and manifests. Section 172.205 specifically addresses use and preparation of hazardous waste

	manifests in accordance with Title 40, CFR, section 262.20.
State	
California Health and Safety Code, Chapter 6.5, §§ 25100, et seq. Hazardous Waste Control Act of 1972, as amended	This California law creates the framework under which hazardous wastes must be managed in California. The law provides for the development of a state hazardous waste program that administers and implements the provisions of the federal RCRA program. It also provides for the designation of California-only hazardous wastes and development of standards (regulations) that are equal to or, in some cases, more stringent than federal requirements. The California Environmental Protection Agency (Cal/EPA), Department of Toxic Substances Control (DTSC) administers and implements the provisions of the law at the state level. Certified Unified Program Agencies (CUPAs) implement some elements of the law at the local level.
Title 22, California Code of Regulations (CCR), Division 4.5 Environmental Health Standards for the Management of Hazardous Waste	These regulations establish requirements for the management and disposal of hazardous waste in accordance with the provisions of the California Hazardous Waste Control Act and federal RCRA. As with the federal requirements, waste generators must determine if their wastes are hazardous according to specified characteristics or lists of wastes. Hazardous waste generators must obtain identification numbers, prepare manifests before transporting the waste off site, and use only permitted treatment, storage, and disposal facilities. Generator standards also include requirements for record keeping, reporting, packaging, and labeling. Additionally, while not a federal requirement, California requires that hazardous waste be transported by registered hazardous waste transporters. The standards addressed by Title 22, CFR include: • Identification and Listing of Hazardous Waste (Chapter 11, §§ 66261.1, et seq.) • Standards Applicable to Generators of Hazardous Waste (Chapter 12, §§ 66262.10, et seq.) • Standards Applicable to Transporters of Hazardous Waste (Chapter 13, §§ 66263.10, et seq.) • Standards for Universal Waste Management (Chapter 23, §§ 66273.1, et seq.) • Standards for the Management of Used Oil (Chapter 29, §§ 66279.1, et seq.) • Requirements for Units and Facilities Deemed to Have a Permit by Rule (Chapter 45, §§ 67450.1, et seq.) The Title 22 regulations are established and enforced at the state level by DTSC. Some generator standards are also enforced at the local level by CUPAs.
California Health and Safety Code, Chapter 6.11 §§ 25404–	The Unified Program consolidates, coordinates, and makes consistent the administrative requirements, permits, inspections, and enforcement activities of the six environmental and emergency response programs

25404.9 Unified Hazardous Waste and Hazardous Materials Management Regulatory Program (Unified Program)	listed below. • Aboveground Storage Tank Program • Business Plan Program • California Accidental Release Prevention (CalARP) Program • Hazardous Material Management Plan / Hazardous Material Inventory Statement Program • Hazardous Waste Generator / Tiered Permitting Program • Underground Storage Tank Program The state agencies responsible for these programs set the standards for their programs while local governments implement the standards. The local agencies implementing the Unified Program are known as Certified Unified Program Agencies (CUPAs). Los Angeles County Department of Environmental Health is the area CUPA. Note: The Waste Management analysis only considers application of the Hazardous Waste Generator/Tiered Permitting element of the Unified Program. Other elements of the Unified Program may be addressed in the **Hazardous Materials** and/or **Worker Health and Safety** analysis sections.
Title 27, CCR, Division 1, Subdivision 4, Chapter 1, §§ 15100, et seq. Unified Hazardous Waste and Hazardous Materials Management Regulatory Program	While these regulations primarily address certification and implementation of the program by the local CUPAs, the regulations do contain specific reporting requirements for businesses. • Article 9 – Unified Program Standardized Forms and Formats (§§ 15400–15410). • Article 10 – Business Reporting to CUPAs (§§ 15600–15620).
Public Resources Code, Division 30, §§ 40000, et seq. California Integrated Waste Management Act of 1989.	The California Integrated Waste Management Act of 1989 (as amended) establishes mandates and standards for management of solid waste. Among other things, the law includes provisions addressing solid waste source reduction and recycling, standards for design and construction of municipal landfills, and programs for county waste management plans and local implementation of solid waste requirements. The act was amended in 2011 (AB 341) to include a legislative declaration of a state policy goal that not less than 75 percent of solid waste generated be source reduced, recycled, or composted by the year 2020. The 2011 amendments expand recycling to businesses and apartment buildings; require the state to develop programs to recycle three-quarters of generated waste; and require commercial and public entities that generate more than four cubic yards of commercial solid waste per week, and multifamily residential dwellings of five units or more, to arrange for recycling services beginning July 1, 2012.

Title 14, CCR, Division 7, § 17200, et seq. California Integrated Waste Management Board	These regulations further implement the provisions of the California Integrated Waste Management Act and set forth minimum standards for solid waste handling and disposal. The regulations include standards for solid waste management, as well as enforcement and program administration provisions. • Chapter 3 – Minimum Standards for Solid Waste Handling and Disposal. • Chapter 3.5 – Standards for Handling and Disposal of Asbestos Containing Waste. • Chapter 7 – Special Waste Standards. • Chapter 8 – Used Oil Recycling Program. • Chapter 8.2 – Electronic Waste Recovery and Recycling.
California Health and Safety Code, Division 20, Chapter 6.5, Article 11.9, §25244.12, et seq. Hazardous Waste Source Reduction and Management Review Act of 1989 (also known as SB 14).	This law was enacted to expand the state's hazardous waste source reduction activities. Among other things, it establishes hazardous waste source reduction review, planning, and reporting requirements for businesses that routinely generate more than 12,000 kilograms (~ 26,400 pounds) of hazardous waste in a designated reporting year. The review and planning elements are required to be done on a 4-year cycle, with a summary progress report due to DTSC every 4th year.
Title 22, CCR, § 67100.1 et seq. Hazardous Waste Source Reduction and Management Review.	These regulations further clarify and implement the provisions of the Hazardous Waste Source Reduction and Management Review Act of 1989 (noted above). The regulations establish the specific review elements and reporting requirements to be completed by generators subject to the act.
California Health and Safety Code Section 101480 101490	These regulations authorize a local officer, such as the director of the Los Angeles County Department of Environmental Health to enter into voluntary agreements for the oversight of remedial action at sites contaminated by wastes.
Title 22, CCR, Chapter 32, §67383.1 – 67383.5	This chapter establishes minimum standards for the management of all underground and aboveground tank systems that held hazardous waste or hazardous materials, and are to be disposed, reclaimed or closed in place.
Title 8, CCR §1529 and §5208	These regulations require the proper removal of asbestos containing materials in all construction work and are enforced by California Occupational Safety and Health Administration (Cal-OSHA).
Title 14, Chapter 9 Division 7 –(AB 939)	AB 939 established the organization, structure, and mission of California Integrated Waste Management Board (CIWMB) in 1989. AB 939 not only mandated local jurisdictions to meet numerical diversion goals of 25% by 1995 and 50% by 2000, but also established an

	integrated framework for program implementation, solid waste planning, and solid waste facility and landfill compliance. Other elements included encouraging resource conservation and considering the effects of waste management operations. The diversion goals and program requirements are implemented through a disposal based reporting system by local jurisdictions under CIWMB regulatory oversight. Facility compliance requirements are implemented under a different approach primarily through local government enforcement agencies. Cal Recycle, formerly known as the CIWMB, is the state's leading authority on recycling, waste reduction, and product reuse officially known as the Department of Resources Recycling and Recovery
Cal OSHA's Lead in Construction Standard is contained in Title 8, Section 1532.1 of the California Code of Regulations	The regulations address all of the following areas: permissible exposure limits (PELs); exposure assessment; compliance methods; respiratory protection; protective clothing and equipment; housekeeping; medical surveillance; medical removal protection (MRP); employee information, training, and certification; signage; record keeping; monitoring; and agency notification.
Title 17, CCR, Division 1, Chapter 8, Section 35001	Requirements for lead hazard evaluation and abatement activities, accreditation of training providers, and certification of individuals engaged in lead-based paint activities.
Local	
South Coast Air Quality Management District (SCAQMD) Rule 1403	This rule establishes survey requirements, notification and work practice requirements to prevent asbestos emissions from emanating during renovation and demolition activities. SCAQMD Rule 1403 incorporates the requirements of the federal asbestos requirements found in National Emissions Standard for Hazardous Air Pollutants (NESHAP) in code of Federal Regulations (CFR) Title 40, Part 61, Subpart M.
Los Angeles County Integrated Waste Management Plan	The plan provides guidance for local management of solid waste and household hazardous waste (incorporates the county's Source Reduction and Recycling Elements, which detail means of reducing commercial and industrial sources of solid waste).
Los Angeles County Health Care Agency - Environmental Health Division, Hazardous Waste Inspection Program	Hazardous Material Division is the Certified Unified Program Agency (CUPA) for Los Angeles County that regulates and conducts inspections of businesses that handle hazardous materials, hazardous wastes, and/or have underground storage tanks. Hazardous Material Division programs include assistance with oversight on property re-development (i.e., brownfields) and voluntary or private oversight cleanup assistance.
LACOFD Health Hazardous Materials Division	Regulates hazardous waste generator permitting and hazardous waste handling and storage.
Los Angeles County Code Section 68.905	Incorporates by reference the California Health & Safety Code Division 20, Chapter 6.11 which requires the facility to operate as a unified

	program facility.
Policy	
Construction & Demolition (C&D) Recycling and Reuse Program Policy	This policy and ensuing program are designed to assist the county in compliance with this state mandate. The Integrated Waste Management Act of 1989 (AB939) required cities and counties to reduce, by 50%, the amount of waste disposed of in landfills by the year 2000 and beyond or potentially incur fines of up to $10,000 per day.

SETTING

PROPOSED PROJECT

The El Segundo Power Facility Modification (ESPFM) is a Petition to Amend (PTA) the ESEC project by replacing existing once-through-cooled (OTC) boiler Units 3 and 4 with new efficient dry-cooled, units 9, 10, 11, and 12. ESPFM would make substantial changes to the ESEC, California Energy Commission license 00-AFC-14.

The ESEC is located on a 33-acre parcel at 301 Vista Del Mar Boulevard in El Segundo, California. ESEC is situated on a highly disturbed industrial brownfield site. The project is located on the coast of the Pacific Ocean between Dockweiler State Beach and the city of Manhattan Beach, and 2.5 miles southwest of the Los Angeles International Airport. Other industrial projects located within a half-mile or less of the project include the Los Angeles Department of Water and Power's Scattergood Generating Station, the city of Los Angeles' Hyperion Wastewater Treatment Plant, the Chevron Marine Terminal and the Chevron Refinery (NRG 2013a, page 2-2).

The PTA proposes to:

- Shutdown and demolition of ESGS Units 3 and 4;
- Removal and remediation of existing ESEC retention basins;
- Change in location for the permitted administration building to a lower elevation;
- Construction of a new administration, maintenance and operations support building;
- Modifications to existing site access; and
- Improvements to beach access (NRG 2013a, page 2-1).

The offsite laydown area would be located at 777 W. 190th Street in Gardena, California. The 190th Street laydown area was incorporated in the 2010 ESEC PTA and would continue to be used for the ESPFM. The 12.1-acre site is paved with asphalt and has night lighting and includes a perimeter security fence (NRG 2013a 3-172).

The demolition of the ESGS Units 3 and 4, remediation of existing retention basins, and the construction and operation of Units 9 through 12, would produce a variety of mixed wastes, such as soil, wood, metal, and concrete. Waste would be recycled where practical and non-recyclable waste would be deposited in a Class III landfill. The

hazardous waste generated during this phase of the project would consist of asbestos debris, heavy metal dust, used oils, universal wastes, solvents, and empty hazardous waste material containers (NRG 2013a, § 2.4). Universal wastes are hazardous wastes that contain mercury, lead, cadmium, copper, and other substances hazardous to human and environmental health. Examples of universal wastes are batteries, fluorescent tubes, and some electronic devices.

Operation and maintenance of the plant and associated facilities would generate a variety of wastes, including a small quantity of hazardous wastes. To control air emissions, the project's turbine units would use selective catalytic reduction and oxidation catalyst equipment and chemicals, which generate both solid and hazardous waste.

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

METHOD AND THRESHOLD FOR DETERMINING SIGNIFICANCE

This waste management analysis addresses: a) existing project site conditions and the potential for contamination associated with prior activities on or near the project site, and b) the impacts from the generation and management of wastes during project construction and operation.

A. For any site in California proposed for the construction of a power plant, the applicant must provide documentation about the nature of any potential or existing releases of hazardous substances or contamination at the site. If potential or existing releases or contamination at the site are identified, the significance of the release or contamination would be determined by site-specific factors, including, but not limited to: the amount and concentration of contaminants or contamination; the proposed use of the area where the contaminants/contamination is found; and any potential pathways for workers, the public, sensitive species or environmental areas could be exposed to the contaminants. Any unmitigated contamination or releases of hazardous substances that pose a risk to human health or environmental receptors would be considered significant by Energy Commission staff.

   As a first step in documenting existing site conditions, the Energy Commission's power plant site certification regulations require that a Phase I Environmental Site Assessment (ESA) be prepared[41] and submitted as part of an application for certification. The Phase I ESA is conducted to identify any conditions indicative of releases and threatened releases of hazardous substances at the site and to identify any areas known to be contaminated (or a source of contamination) or near the site.

[41] Title 20, California Code of Regulations, section 1704(c) and Appendix B, section (g)(12)(A). Note that the Phase I ESA must be prepared according to American Society for Testing and Materials protocol or an equivalent method agreed upon by the applicant and the Energy Commission staff.

In general, the Phase I ESA uses a qualified environmental professional to conduct inquiries into past uses and ownership of the property, research hazardous substance releases and hazardous waste disposal at the site and within a certain distance of the site, and visually inspect the property, making observations about the potential for contamination and possible areas of concern. After conducting all necessary file reviews, interviews, and site observations, the environmental professional then provides findings about the environmental conditions at the site. In addition, since the Phase I ESA does not include sampling or testing, the environmental professional may also give an opinion about the potential need for any additional investigation. Additional investigation may be needed, for example, if there were significant gaps in the information available about the site, an ongoing release is suspected, or to confirm an existing environmental condition.

If additional investigation is needed to identify the extent of possible contamination, a Phase II ESA may be required. The Phase II ESA usually includes sampling and testing of potentially contaminated media to verify the level of contamination and the potential for remediation at the site.

In conducting its assessment of a proposed project, Energy Commission staff will review the project's Phase I ESA and work with the appropriate oversight agencies as necessary to determine if additional site characterization work is needed and if any mitigation is necessary at the site to ensure protection of human health and the environment from any hazardous substance releases or contamination identified.

B. Regarding the management of project-related wastes generated during construction and operation of the proposed project, staff reviewed the applicant's proposed solid and hazardous waste management methods and determined if the methods proposed are consistent with the LORS identified for waste disposal and recycling. The federal, state, and local LORS represent a comprehensive regulatory system designed to protect human health and the environment from impacts associated with management of both non-hazardous and hazardous wastes. Absent any unusual circumstances, staff considers project compliance with LORS to be sufficient to ensure that no significant impacts would occur as a result of project waste management.

   Staff then reviewed the capacity available at off-site treatment and disposal sites and determines whether or not the proposed power plant's waste would have a significant impact on the volume of waste a facility is permitted to accept. Staff used a waste volume threshold equal to 10 percent of a disposal facility's remaining permitted capacity to determine if the impact from disposal of project wastes at a particular facility would be significant.

DIRECT/INDIRECT IMPACTS AND MITIGATION

Existing Site Contamination

The ESGS was built on the project site as a gas-fired, ocean-cooled steam-powered electricity generating station. Units 1 and 2 were constructed in the 1950s, and Units 3

and 4 were constructed in the 1960s. The demolition and removal of the original Units 1 and 2 occurred in 2009 through 2010. ESEC Units 5, 6, 7 and 8 were located on the site previously occupied by Units 1 and 2. The PTA proposes to remove steam boiler Units 3 and 4 and replace them with efficient dry-cooled natural gas-fired combustion turbines Units 9, 10, 11 and 12.

A Phase I ESA dated October 24, 2013, was prepared by Environmental Resources Management for the ESEC. The ESA encompassed 33 acres situated on four parcels, 4138-029-800, 4138-029-802, 4138-029-803, and 4138-029-004. The ESA was completed in accordance with the American Society for Testing and Materials Standard Practice E 1527-05 for ESAs (LL 2013j). The RECs and Historical RECs identified are included in **WASTE MANAGEMENT Table 2** and **WASTE MANAGEMENT Figure 1**.

WASTE MANAGEMENT Table 2
Recognized Environmental Conditions (RECs)

REC	**Description**	**Remediation Responsibility**
Groundwater contamination flowing onsite from the adjacent Chevron Refinery	The Los Angeles Regional Water Quality Board (LARWQCB) issued a Cleanup and Abatement Order No. 88-55 in 1988 to Chevron USA. They were directed to clean up a petroleum hydrocarbon and volatile organic compound release to soil and groundwater at the Chevron Refinery and surrounding areas. Releases from the Chevron Refinery have resulted in soil and groundwater contamination beneath the entire ESGS site. SWRCB Geotracker ID SL372482441	In 1995, LARWQCB issued a Revised Cleanup and Abatement Order to Chevron Refinery for contaminant clean up in groundwater and soil beneath ESGS.
Uninvestigated Areas of Concern (AOC)	The AOCs are located beneath the administration trailers, the parking and laydown area, the Cutter Oil AST and the Southern California Edison (SCE) Switchyard.	These shall be addressed during decommissioning and demolition of Units 3 and 4.
Areas of Potential Concern (APOC)	Twenty-nine areas of AOPCs were identified on the ESGS site. Twenty-one were located in the location of current ESEC area/Units 1 & 2. Most of the features have been removed or remediated	The AOPCs are considered Historical Recognized Environmental Concerns HRECs. These shall be address during decommissioning and demolition of Units 3 and 4.
Retention Basins	The soil and groundwater beneath, and at localized areas parallel to, the pipelines between the generating units and the retention basins have been impacted by heavy metals, primarily nickel and vanadium. DTSC Envirostor ID number 60001197	SCE is required to mitigate impacted soil and groundwater under DTSC oversight during closure activities.SCE has completed a Draft Closure Plan for public review.

Visitor Parking Area	Two bulk aboveground storage tanks (ASTs) were removed from the current parking and laydown area in 2011 and 2013. The soil beneath the ASTs is impacted with hydrocarbons. Protective asphalt caps were installed to prevent infiltration of surface water/rainwater to keep facility personnel from coming into contact with impacted soil.	NRG would be conducting additional investigation to assess the impacted areas.
Suspect Structures and Metal-Impacted Soil	Boiler chemical waste was discharged to trenches/pits located adjacent to the west switchyard, and north of the Gas Compressor building. Laboratory results of black-stained soil around switchyard and compressor building indicates elevated concentrations of metals, arsenic, lead, nickel and vanadium. Several other metals were detected above background concentrations at these locations.	NRG would conduct further assessments as part of the decommissioning of Units 3 & 4.
PCB-impacted groundwater	PCBs were detected at the soil-groundwater interface in two areas of the ESGS, the northwest and southwest corners of the former Units 1 and 2 foundations.	NRG is in the process of implementing a groundwater assessment program.
Source: NRG Phase I ESA, dated October 24, 2013 (LL 2013j).		

In 1996, Southern California Edison Company (SCE) implemented a Water Quality Monitoring Program in response to a Final Judgment pursuant to a Stipulation, handed down by the Superior Court in California. The Stipulation determined that SCE has stored hazardous wastes in non-permitted wastewater retention basins at many of their electrical generating stations in southern California. The ESGS is one of the facilities cited in the agreement. Edison agreed to close these basins according to Chapter 15 of Title 22, California Code of Regulations.

SCE developed a Closure Plan for the Department of Toxic Substances Control (DTSC). The purpose of the Closure Plan is to allow DTSC and public review of the proposed plans, standards, and contingencies for remediating the ESGS retention basin site. The Closure Plan included areas where historical boiler cleaning operations may have led to contamination. Those areas include the retention basin, pipelines, drains and sumps that conveyed chemicals and wastewater to the retention basin (SCE 2010, page 14). The basins have not stored hazardous wastewater for 17 years (SCE 2010, page 19).

In 1965, the ESGS had a single wastewater retention basin. In 1987, the wastewater retention basin was partitioned into two basins separated by a thick concrete wall. The larger, northern portion of the original basin was designated as the Retention Basin. The smaller, southern portion was used as a Boiler Chemical Cleaning Basin. In 1989, a double liner of HDPE and leachate collection system was installed over the asphaltic

liner. Currently, the North Retention Basin is used to collect and store non-hazardous wastewater and stormwater runoff from the facility. No process wastewater would be discharged from the ESEC facility via the existing retention basin or either outfall structure (NRG 2013a, page 2-20). Plant drains that conveyed plant wastes from Units 3 and 4 to the retention basin and the retention basin would be removed (NRG 2013a, 2-21).

Chevron USA was directed to clean up a total petroleum hydrocarbon and volatile organic compound release to soil and groundwater at the Chevron Refinery and surrounding areas. Releases from the Chevron Refinery have resulted in soil and groundwater contamination beneath the ESGS site.

The project owner would come in contact with many of the RECs listed in **WASTE MANAGEMENT Table 2** during demolition. The project owner and SCE has indicated they would contact the regulatory agency and, when required complete remediation, of contaminated areas prior to construction. SCE is accountable for some of the environmental liability associated with the past operation. SCE is currently working with the DTSC on the closure of the ESEC retention basin site and all related equipment (Jamison and Associates 2012).

Staff has reviewed the existing conditions of certification which were adopted for the ESEC. These conditions were developed to address site contamination during, demolition, construction, and operation of ESEC. Staff believes these conditions are sufficient to ensure that the demolition and construction of ESPFM would not result in any impacts to the environment and health and safety of site personnel. Condition of Certification **WASTE-1** requires that the project owner maintain a Waste Generator Identification. This number is used to identify and track the project activities related to storage and transportation of hazardous waste from the site. The project owner would be required to temporary storage and transport waste, use licensed hazardous waste haulers, and recycle or dispose of waste at authorized disposal facilities in accordance with established standards applicable to generators of hazardous waste with Title 22, CCR, §§ 66262.10 et seq. Proper hazardous material handling and good housekeeping practices would help keep spill wastes to a minimum. However, to ensure proper cleanup and management of any contaminated soils or waste materials generated from hazardous materials spills, staff proposes Condition of Certification **WASTE-2** requiring the project owner/operator to report, clean up, and remediate as necessary, any hazardous materials spills or releases in accordance with all applicable federal, state, and local requirements. More information on hazardous material management, spill reporting, containment, and spill control and countermeasures plan provisions for the project are provided in the Hazardous Materials Management section of the ESPFM PTA staff analysis.

Furthermore, Conditions of Certification **WASTE-4**, **WASTE-5**, **WASTE-6**, and **WASTE-9** address any soil contamination contingency that may be encountered during project construction. Condition of Certification **WASTE-4** requires that an experienced and qualified Professional Engineer or Professional Geologist be available for consultation in the event contaminated soil not previously identified is encountered. If contaminated soil is identified, Condition of Certification **WASTE-5** requires that the Professional Engineer

or Professional Geologist inspect the site, determine what is required to characterize the nature and extent of contamination, and provide a report to the CPM with findings and recommended actions. Conditions of Certification **WASTE–6** and **WASTE-9** also addresses identification and investigation of any previously unidentified soil or groundwater contamination that may be encountered. Condition of Certification **WASTE-9** is added to reflect the changes associated with the ESPFM.

ESEC has programs in place to deal with waste management issues at the project site from the demolition of Units 1 and 2 and the fuel oil tanks, and the construction of Units 5 through 8. SCE has a Draft Closure Plan for the retention basins. The Chevron Refinery cleanup is ongoing. The ESEC staff has historically complied with the conditions of certification. Previous examples of compliance with conditions and regulation include a March 3, 2011, submittal, in response to the fuel oil storage tank demolition. ESEC provided staff with asbestos surveys, a mercury remediation certification letter, waste manifests for disposal of asbestos containing material (ACM) and the Hazardous Waste Tank Inspection certification, in response to Conditions of Certification **LAND-6**, **WORKER SAFETY-3**, and **WASTE-6**.

Demolition and Construction Impacts and Mitigation

The entire construction and commissioning schedule is anticipated to last approximately 30 months. The decommissioning, demolition, and removal of existing Units 3 and 4 is anticipated to take approximately six months. Following completion of site preparation activities, construction and startup of the ESPFM are expected to take approximately 24 months, from site mobilization to commercial operation. Site preparation, demolition, and construction of the proposed power plant and associated facilities would generate both nonhazardous and hazardous wastes in solid and liquid forms. Before demolition and construction can begin, the project owner would be required to develop and implement a demolition for Units 3 and 4, and Construction Waste Management Plan for Units 9,10, 11, and 12, per proposed Condition of Certification **WASTE-3**.

Nonhazardous Wastes

Nonhazardous waste would be generated from the demolition and construction of Units 3 and 4, and the construction and installation of ESPFM Units 9, 10, 11 and 12. Demolition and construction waste would consist of wood, glass, plastic, paper, scrap metals, concrete, and asphalt. All non-hazardous wastes would be recycled to the extent possible and non-recyclable wastes would be collected by a licensed hauler and disposed in a solid waste disposal facility, in accordance with Title 14, California Code of Regulations, section 17200 et seq.

Nonhazardous waste streams from construction include paper, scrap wood, glass, metal, plastics, concrete, asphalt, oil absorbent mats, and oily rags (NRG 2013a, Table 2-12). The applicant estimates that about 20-40 cubic yards of these types of wastes would be generated on a weekly basis plus about 1000 square 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. PTA Table 2-12 provides descriptions of construction and demolition waste streams and management methods (NRG 2013a, pages 2-16).

PTA Table 2-12 also lists wastes typically generated during construction which 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 most likely be recycled. PTA Table 2-12 additionally lists the management methods of the wastes.

Nonhazardous liquid wastes would also be generated during construction, including sanitary wastes, dust suppression and stormwater drainage, and equipment wash and test water. Sanitary wastes would be collected in portable, self-contained chemical toilets and pumped periodically for disposal at an appropriate facility. Potentially contaminated equipment wash and/or test water would be contained at designated areas, tested to determine if hazardous, and either discharged to the storm water retention basin (if nonhazardous) or transported to an appropriate treatment/disposal facility. Please see the **Soil and Water Resources** section of this document for more information on the management of project wastewater.

Hazardous Wastes

Demolition, dewatering, and construction are expected to generate both solid and liquid hazardous wastes (NRG 2013a, Table 2-12). The waste generated would include: asbestos waste, electrical equipment, used oils, universal wastes and lead-acid storage batteries (NRG 20013a, page 2-16). Demolition of Units 3 and 4 would generate 122,767 square feet of asbestos containing materials that would be disposed of in a permitted facility (NRG 2013a, Table 2-10 and 2-11). The project owner shall submit a survey of all Asbestos-Containing Materials (ACM) and Regulated Building Materials (RBM) that contain lead-based paint to the El Segundo Fire Department. The South Coast Air Quality Management District (SCAQMD) Rule 1403 requires the owner or operator of a demolition or renovation to submit an Asbestos Demolition or Renovation Operation Plan at least 10 working days before any asbestos stripping or removal work begins. Condition of Certification **WASTE-8** requires that the project owner submit the ACM and lead survey to the El Segundo Fire Department, and the SCAQMD Asbestos Notification Form for review and approval prior to removal and disposal of asbestos. This program ensures there would be no release of asbestos that could impact public health and safety. The generation of other hazardous wastes anticipated during construction includes empty hazardous material containers, solvents, waste paint, oil absorbents, used oil, oily rags, batteries, and cleaning wastes. The amount of waste generated would be minor if handled in the manner identified in the PTA (NRG 2013a).

During demolition, as much as 20,000 cubic yards of contaminated soil would be excavated and managed. More may be encountered in other areas including soils beneath the footprints of Units 3 and 4 and other structures to be demolished. All excavated soil would be characterized and managed according to the Waste Management Plan and Condition of Certification **WASTE-3**. The soil would be transported to a soil recycling facility or a Class I landfill.

Should any construction waste management-related enforcement action be taken or initiated by a regulatory agency, the project owner would be required by proposed

Condition of Certification **WASTE-2** to notify the Energy Commission's CPM whenever the owner becomes aware of any such action.

In the event that construction excavation, grading, or trenching activities for the proposed project encounter potentially contaminated soils and/or specific handling, disposal, and other precautions that may be necessary pursuant to hazardous waste management LORS, staff finds that proposed Conditions of Certification **WASTE-4** and **WASTE-5** would be adequate to address any soil contamination contingency that may be encountered during construction of the project and would ensure compliance with LORS. Absent any unusual circumstances, staff considers project compliance with LORS to be sufficient to ensure that no significant impacts would occur as a result of project waste management activities.

Operation Impacts and Mitigation

The proposed ESPFM would generate non-hazardous and hazardous wastes in both solid and liquid forms under normal operating conditions. Section 2.4, Table 2-13, of the project PTA provides a summary of the operation waste streams, expected waste volumes and generation frequency, and management methods proposed. Before operations can begin, the project owner would be required to develop and implement an Operation Waste Management Plan pursuant to proposed Condition of Certification **WASTE-3**.

Non-Hazardous Solid Wastes

The generation of non-hazardous solid wastes expected during project operation includes routine maintenance wastes as well as domestic and office wastes (such as office paper, newsprint, aluminum cans, plastic, and glass). All non-hazardous wastes would be recycled to the extent possible, and non-recyclable wastes would be regularly transported off site to a local solid waste disposal facility.

Non-Hazardous Liquid Wastes

Non-hazardous liquid wastes would be generated during facility operation and are discussed in the **Soil and Water Resources** section of this document.

Hazardous Wastes

The generation of hazardous wastes expected during routine project operation includes used hydraulic fluids, oils, greases, oily filters and rags, spent selective catalytic reduction catalysts, cleaning solutions and solvents, and batteries. In addition, spills and unauthorized releases of hazardous materials or hazardous wastes may generate contaminated soils or materials that may require corrective action and management as hazardous waste. Proper hazardous material handling and good housekeeping practices would help keep spill wastes to a minimum. However, to ensure proper cleanup and management of any contaminated soils or waste materials generated from hazardous materials spills, staff proposes Condition of Certification **WASTE-5** requiring the project owner/operator to report, clean up, and remediate as necessary, any hazardous materials spills or releases in accordance with all applicable federal, state, and local requirements. More information on hazardous material management, spill reporting, containment, and spill control and countermeasures plan provisions for the

project are provided in the Hazardous Material Management section of the PTA analysis.

Hazardous wastes likely to be generated during routine project operation include oily water, Combustion Turbine Generator wastewater, heat recovery steam generator (HRSG) washwater, spent selective catalytic reduction (SCR) catalysts, and minimal amounts of used cleaning solvents. About 5 gallons per day of oily water, 7200 gallons per year of CTG wastewater, 50,000 gallons of HRSG wash water 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 (NRG 2013a, Table 2-13). The amount of hazardous wastes generated during the operation of ESPFM would be minor with source reduction and recycling of wastes implemented whenever possible (NRG 2013a, Table 2-13).

The hazardous wastes would be temporarily stored on site, transported off site by licensed hazardous waste haulers, and recycled or disposed at authorized disposal facilities in accordance with established standards applicable to generators of hazardous waste (Title 22, CCR, §§ 66262.10 et seq.). Should any operations waste management-related enforcement action be taken or initiated by a regulatory agency, the project owner would be required by proposed Condition of Certification **WASTE-2**, to notify the CPM whenever the owner becomes aware of any such action.

Impact on Existing Waste Disposal Facilities

Non-Hazardous Wastes

The ESPFM facility would generate nonhazardous solid waste that would add to the total waste generated in Los Angeles County, California. The proposed project would generate approximately 25, 200 cubic yards of solid waste during demolition and construction of ESPFM, and less than 100 cubic yards per year would be produced during operation. Nonhazardous waste would be disposed in a California Class III landfill (NRG 2013a, Section 2.4).

WASTE MANAGEMENT Table 3 presents details of three non-hazardous (Class III) waste disposal facilities that could potentially take the non-hazardous construction and operation wastes that would be generated but could not be diverted by the ESPFM. Total solid waste disposal in Los Angeles County in 2014, was 6.4 million tons[42]. The remaining capacity for the three landfills listed in Waste Table 3 combined is approximately 471 million cubic yards. The total amount of non-hazardous waste generated from project demolition and construction is 25, 200 cubic yards based on a 30-month schedule. During operation the majority of solid waste generated would be recycled and diverted to the maximum extent feasible (NRG 2013 a, Tables 2-12 and 2-13). Less than 100 cubic yards per year would be generated during operation. Solid waste disposal from ESPFM would contribute less than one percent of the available landfill capacity. Staff concludes that disposal of the solid wastes generated by ESPFM

[42] http://www.calrecycle.ca.gov/SWFacilities/Directory/default.htm

could occur without significantly impacting the capacity or remaining life of any of these facilities.

Hazardous Wastes

WASTE MANAGEMENT Table 3 displays information on the Class I landfills available in California. The Kettleman Hills facility also accepts Class II and Class III wastes. Kettleman Hills and Buttonwillow landfills have a combined approximately 15 million cubic yards of remaining hazardous waste disposal capacity, with up to 30 years of maximum remaining operating lifetime.

WASTE MANAGEMENT Table 3
Recycling/Disposal Facilities

Landfill[43]	**Location**	**Maximum Permitted Capacity**	**Remaining Capacity**	**Estimated Closure Date**
	City	Cubic yards	Cubic yards	
Class III - Nonhazardous				
Frank Bowerman Sanitary Landfill	Irvine, CA	266 million	205 million	2053
El Sobrante Landfill	Corona, CA	185 million	146 million	2045
Simi Valley Landfill	Simi Valley, CA	120	120 million	2052
Class I - Hazardous Waste				
Chemical Waste Management-Kettleman (Class I, II, III)	Kettleman, CA	10 million	6 million	2044
Clean Harbors Buttonwillow (Class I)	Kern, CA	14.3 million	9.2 million	2040
Source: CEC 2005a,Capacities updated using CalRecycle Solid Waste Information System (SWIS)				

Hazardous wastes generated during demolition, construction, and operation would be recycled to the extent possible and practical. Those wastes that cannot be recycled would be transported off site to a permitted treatment, storage, or disposal facility. Approximately 122,767 square feet of friable asbestos, would be generated from the demolition of Units 3 and 4. Less than 100 cubic yards per year of other hazardous waste would be generated during demolition, construction and operation of ESPFM. The total amount of hazardous wastes generated by the ESPFM project would consume less than one percent of the 15 million cubic yards of remaining permitted capacity.

[43] List of landfills obtained from AFC 00-AFC-14 Waste Management section.

Therefore, impacts from disposal of ESPFM generated hazardous wastes would have a less than significant impact on the remaining capacity at Class I landfills.

CUMULATIVE IMPACTS AND MITIGATION

The CEQA Guidelines (Section 15355) define cumulative effects as “two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts.”

Long-term cumulative impacts are not anticipated with the implementation of ESPFM and the listed projects in the **Project Description’s ESPFM Master List of Cumulative Impacts** because each project is required to comply with CEQA guideline requirements for evaluating potential cumulative impacts, and /or obtain approval from the city prior to permitting and construction by demonstrating conformance to existing CalRecycle (Title 24) and the County of Los Angeles C&D regulations or ordinances. As proposed, the amount of non-hazardous and hazardous wastes generated during construction and operation of the ESPFM would add to the total quantity of waste generated in the State of California, however, project wastes would be generated in modest quantities. Approximately 25,200 cubic yards of solid waste and approximately 122,767 square-feet of asbestos would be generated during demolition of Units 3, and 4 and construction of Units 9 through 12, and less than 100 tons per year of hazardous waste would be generated during operation (NRG 2013a, pages 2-12 through 2-17). Waste recycling would be employed wherever practical, and sufficient capacity is available at several treatment and disposal facilities to handle the volumes of wastes that would be generated by the project. In 2012, 6.4 million tons of solid waste was landfilled in Los Angeles County. ESPFM’s contribution would be less than one percent of the county’s waste generation.

COMPLIANCE WITH LORS

Energy Commission staff concludes that the proposed ESPFM would comply with all applicable LORS regulating the management of hazardous and non-hazardous wastes during both facility construction and operation. The project owner is required to recycle and/or dispose hazardous and non-hazardous wastes at facilities licensed or otherwise approved to accept the wastes. Because hazardous wastes would be produced during both project construction and operation, the ESPFM would be required to obtain a hazardous waste generator identification number from U.S. EPA. The ESPFM would also be required to properly store, package, and label all hazardous waste; use only approved transporters; prepare hazardous waste manifests; keep detailed records; and appropriately train employees, in accordance with state and federal hazardous waste management requirements.

In the **Socioeconomics** section of this staff assessment, staff presents census information that shows that there are minority populations within one mile and six miles of the project. Since staff has added conditions of certification that would reduce the risk associated with hazardous waste to a less than significant level, staff concludes that there would be no significant impact from construction or operation of the power plant

on minority populations. Therefore, there are no environmental justice issues for Waste Management.

NOTEWORTHY PUBLIC BENEFITS

The noteworthy Waste Management public benefits for the ESEC include the mitigation and/or remediation of the majority of Recognized Environmental Conditions outlined in **WASTE MANAGEMENT Table 2**. Areas of potential concern, the retention basins, the visitor parking area, areas of metal impacted soil and PCB-impacted soil would be accessible with the demolition and removal of the older units.

RESPONSE TO AGENCY AND PUBLIC COMMENTS

There were no agency or public comments on the project related to Waste Management.

CONCLUSIONS

Consistent with the three main objectives for staff's waste management analysis (as noted in the Introduction section of this analysis), staff provides the following conclusions:

1) After review of the applicant's proposed waste management procedures, staff concludes that project wastes would be managed in compliance with all applicable waste management LORS. Staff notes that demolition, construction and operation wastes would be characterized and managed as either hazardous or non-hazardous waste. All non-hazardous wastes would be recycled to the extent feasible, and nonrecyclable wastes would be collected by a licensed hauler and disposed of at a permitted solid waste disposal facility. Hazardous wastes would be accumulated onsite in accordance with accumulation time limits and then properly manifested, transported to, and disposed of at a permitted hazardous waste management facility by licensed hazardous waste collection and disposal companies.

   However, to help ensure and facilitate ongoing project compliance with LORS, staff proposes Conditions of Certification **WASTE-1** through **WASTE-9**. These conditions would require the project owner to do all of the following:

   - Once the ESPFM project owner identifies which areas of contamination will be remediated staff proposes conditions that ensure the project site is investigated and any contamination identified is remediated as necessary, with appropriate professional and regulatory agency oversight (**WASTE-1**, **2**, **4**, 5 and **9**).

   - Report any waste management-related LORS enforcement actions and how violations will be corrected (**WASTE-2**).

- Prepare Construction Waste Management and Operation Waste Management Plans detailing the types and volumes of wastes to be generated and how wastes will be managed, recycled, and/or disposed of after generation (**WASTE-3**).

2) Conditions at the ESPFM project site do include areas where prior site uses and/or demolition activities may have resulted in releases of hazardous substances or soil contamination. To ensure that the project site is investigated and remediated as necessary and to reduce any impacts from prior or future hazardous substance or hazardous waste releases at the site to a level of insignificance, staff proposes Conditions of Certification **WASTE-1**, **2**, **4**, **5**, **6**, **7, 8** and **9**. These conditions would require the project owner to ensure that the project site is investigated and remediated as necessary; demonstrate that project wastes are managed properly; and ensure that any future spills or releases of hazardous substances or wastes are properly reported, cleaned-up, and remediated as necessary. Therefore, staff concludes that demolition, construction, and operation of the proposed ESPFM project would not result in contamination or releases of hazardous substances that would pose a substantial risk to human health or the environment.

3) Regarding impacts of project wastes on existing waste disposal facilities, staff uses a waste volume threshold equal to ten (10) percent of a disposal facility's remaining capacity to determine if the impact from disposal of project wastes at a particular facility would be significant. The existing available capacity for the three Class III landfills that may be used to manage nonhazardous project wastes exceeds 471 million cubic yards. The total amount of nonhazardous wastes generated from construction and operation of ESPFM would contribute less than 0.1 percent of the remaining landfill capacity. Therefore, disposal of project generated non-hazardous wastes would have a less than significant impact on Class III landfill capacity.

   In addition, the two Class I disposal facilities that could be used for hazardous wastes generated by the construction and operation of ESPFM have a combined remaining capacity in excess of 15 million cubic yards. The total amount of hazardous wastes generated by the ESPFM project would contribute less than one percent of the remaining permitted capacity. Therefore, impacts from disposal of ESPFM generated hazardous wastes would also have a less than significant impact on the remaining capacity at Class I landfills.

Staff concludes that management of the waste generated during demolition, construction and operation of the ESPFM project would not result in any significant adverse impacts, and would comply with applicable LORS, if the waste management practices and mitigation measures proposed in the ESPFM project and staff's proposed conditions of certification are implemented.

PROPOSED CONDITIONS OF CERTIFICATION

Condition of Certification **WASTE-8** was updated to reflect additional LORS required for the disposal of asbestos. Staff added Condition of Certification **WASTE-9** to reflect the

changes for ESPFM, which include the demolition of Units 3 and 4 and the construction of Units 9, 10, 11, and 12.

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. **Submittal of the notification and issued number documentation to the CPM is only needed once unless there is a change in ownership, operation, waste generation, or waste characteristics that requires a new notification to U.S. EPA. Documentation of any new or revised hazardous waste generation notifications or changes in identification number shall be provided to the CPM in the next scheduled compliance report.**

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 CPM for review and approval, and to local agencies, if applicable, for review and **timely** comment, a waste management plan for all wastes generated during construction and operation of the facility, respectively. The plans shall contain, at a minimum, the following:

- A description of all waste streams, including projections of frequency, amounts generated and hazard classifications; and
- Methods of managing each waste, including 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 demolition and construction waste management plan to and to local agencies, if applicable, for review and **timely** comment, 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 Los Angeles Regional Water Quality Control Board, the **Chatsworth Field** Office of the California Department of Toxic Substances Control the CPM, and other local agencies, if applicable, for guidance and possible oversight.

Verification: The project owner shall submit any reports filed by the Registered Professional Engineer or Geologist to the CPM and the City of El Segundo Fire Department 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 either the fuel oil tanks or the existing generator buildings and any other building, respectively, 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 **Chatsworth Field Office** of the California Department of Toxic Substances Control, the Los Angeles Regional Water Quality Control, and the City of El Segundo Fire Department, and other local agencies, if applicable, for review and **timely** 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 fuel tank or structure demolition, respectively, the project owner shall provide the RI Workplan to the **Chatsworth Field Office** of the California Department of Toxic Substances Control, the Los Angeles Regional Water Quality Control Board, the City of El Segundo Fire Department, other agencies, if applicable, 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 **Chatsworth Field Office** of the California Department of Toxic Substances Control, the Los Angeles Regional Water Quality Control Board, the City of El Segundo Fire Department, other agencies, if applicable, and the CPM for review and guidance on possible remediation.

WASTE-7 Before demolition of, the existing generator buildings and any other building, the project owner shall ensure that the appropriate portion of the site is surrounded by a berm or other solid structures capable of containing any runoff from that portion of 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.

Verification: 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.

WASTE-8 Prior to modification or demolition of existing structures, the project owner shall complete and submit a survey of all Asbestos-Containing Materials (ACM) and Regulated Building Materials (RBM) that contain lead-based paint to the El Segundo Fire Department **and a South Coast Air Quality Management District Asbestos Demolition Notification Form (SCAQMD Rule 1403)** for review and **timely** comment and to the CPM for approval. After receiving approval, the project owner shall remove all ACM and RBM from the site prior to demolition.

Verification: no less than sixty (60) days prior to commencement of structure demolition, the project owner shall provide the survey to the El Segundo Fire Department **and the South Coast Air Quality Management District** for review and **timely** comment, and to the CPM for review and approval. The project owner shall inform the CPM, via the monthly compliance report, of the data when all ACM and RBM were removed from the site.

WASTE-9 Before demolition of the existing Units 3 and 4 and any other support building or equipment, 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 Chatsworth Field Office of the California Department of Toxic Substances Control (DTSC), the Los Angeles Regional Water Quality Control (LARWQCB), and the City of El Segundo Fire Department, and other local agencies, if applicable, for review and timely comment, and to the 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 Units 3 and 4 demolition or structure demolition, respectively, the project owner shall provide the RI Workplan to the Chatsworth Field Office of the California Department of Toxic Substances Control, the Los Angeles Regional Water Quality Control Board, the City of El Segundo Fire Department, other agencies, if applicable, and the 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 Chatsworth Field Office of the California Department of Toxic Substances Control, the Los Angeles Regional Water Quality Control Board, the City of El Segundo Fire Department, other agencies, if applicable, and the CPM for review and guidance on possible remediation.

REFERENCES

CEC 2005a- CEC (CEC-800-2005-001-CMF). El Segundo Power Redevelopment Project Commission Decision, dated 2/2005.

CEC 2010a- CEC (CEC-800-2010-015). El Segundo Power Redevelopment Project Amendment Commission Decision, dated 6/2010.

CEC 2013a- CEC / C. Marxen (TN 70818). Notice of Receipt for the Petition to Amend, dated 5/14/2013. Submitted to CEC on 4/23/2013.

ESUSD 2013a- El Segundo Unified School District (TN 201003) El Segundo Unified School District Development Fees. Submitted to CEC on 10/23/2013.

ESUSD 2013b- El Segundo Unified School District (TN 201004) El Segundo Unified School District School Capacity. Submitted to CEC on 10/23/2013.

LL 2013a- Locke Lord / J. McKinsey (TN 70977). Applicant's letter dated May 17, 2013 to South Coast Air Quality Management District and Applicant's letter dated May 22, 2013 to South Coast Air Quality Management District. Submitted to CEC on 5/28/2013.

LL 2013b- Locke Lord / J. McKinsey (TN 71011). Applicant's letter dated May 24, 2013 to South Coast Air Quality Management District. Submitted to CEC on 5/29/2013.

LL 2013c- Locke Lord / J. McKinsey (TN 71279). Applicant's letter dated June 10, 2013 to South Coast Air Quality Management District. Submitted to CEC on 6/12/2013.

LL 2013d- Locke Lord / J. McKinsey (TN 200471). El Segundo Application for Confidential Designation of Cultural Resources Records. Submitted to CEC on 9/12/2013.

LL 2013e- Locke Lord / J. McKinsey (TN 200464). Applicant's Responses to Data Requests in Set One (#1-83). Submitted to CEC on 9/12/2013.

LL 2013f- Locke Lord / J. McKinsey (TN 200532). Applicant's Responses to Data Requests in Set Two (#84-90). Submitted to CEC on 9/19/2013.

LL 2013g- Locke Lord / J. McKinsey (TN 200532). Applicant's Supplemental Responses to Certain Data Requests in Set One (17, 19, 23, 34, 36, 38, 40 and 56). Submitted to CEC on 9/23/2013.

LL 2013h- Locke Lord / J. McKinsey (TN 200470). El Segundo Application for Confidential Designation of Air Quality Data Equations, Formulas and

Calculations. Submitted to CEC on 9/12/2013.

LL 2013i- Locke Lord / J. McKinsey (TN 200097). Sierra Research Supplemental Impact Analysis for the El Segundo Power Facility Modification Project. Letter dated July 31, 2013, to South Coast Air Quality Management District. Submitted to CEC on 7/31/2013.

LL 2013j- Locke Lord / J. McKinsey (TN 201082). Data Request 87 of Data Request Set Two. Submitted to CEC on 10/30/2013.

LL 2013k- Locke Lord / J. McKinsey (TN 201092). Data Requests in Set Three (#91-92). Submitted to CEC on 10/31/2013.

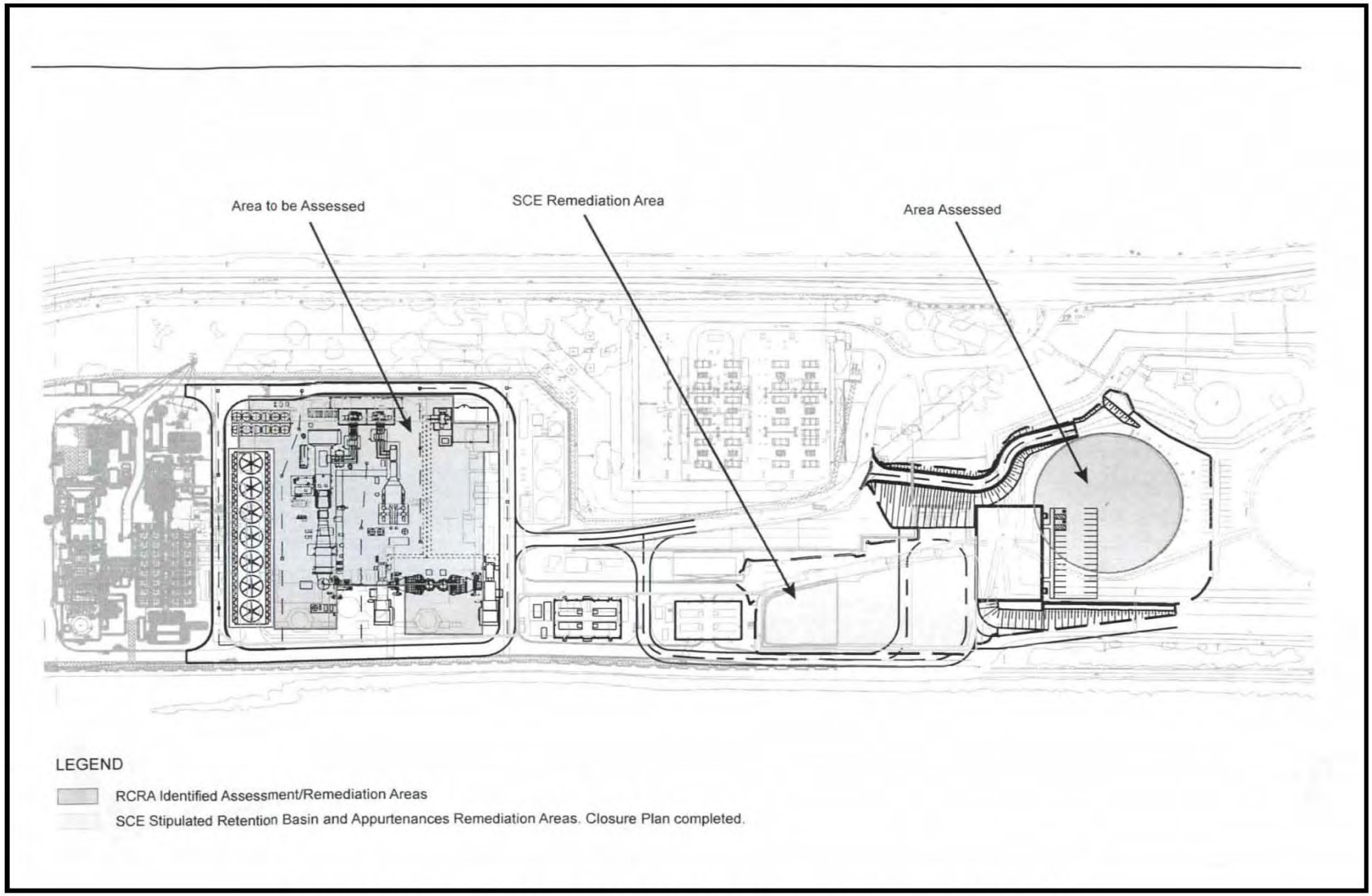
NRG 2013a- NRG / El Segundo Energy Center LLC (TN 70442) Petition to Amend, dated April 2013. Submitted to CEC on 04/23/2013.

NRG 2013b- NRG / El Segundo Energy Center LLC (TN 201000) ESEC Operational Employees. Submitted to CEC on 10/23/2013.

SCE 2010 SCE/Jamison and Associates, Inc. Draft Closure Plan El Segundo Generating Station Retention Basin Site, Los Angeles, California. May 2010.

WASTE MANAGMENT - FIGURE 1

El Segundo Energy Center Amendment (ESEC) - Areas For Investigation or Identified Remediation



CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCE: TN 200532 Figure DR88-1, CH2HILL

WORKER SAFETY AND FIRE PROTECTION

Testimony of Alvin Greenberg, Ph.D.

SUMMARY OF CONCLUSIONS

California Energy Commission staff (staff) evaluated the proposed El Segundo Energy Center, LLC (ESEC LLC) modified project (amendment dated April 23, 2013; NRG 2013a) in terms of worker safety and fire protection matters. 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 workplace safety practices that include engineering controls, administrative controls, and worker 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 controls, special training, or use of protective equipment.

In the period since the original licensing of this project in 2000, a Petition to Amend was filed in 2005, a staff assessment to that Petition was filed in 2005, a Decision was filed in 2005 (CEC 2005a), a second Petition to Amend was filed in 2007, a staff assessment to that Petition was published in 2008, and a Decision was adopted in 2010 (CEC 2010a). Even though substantial and numerous modifications have been made to this power plant over the past ten years and additional changes are now proposed for the modified project, staff is not proposing new conditions of certification for the modified project, also known as the El Segundo Power Facility Modification (ESPFM). The existing Conditions of Certification with minimal revisions to reflect current nomenclature, current Energy Commission practice, and to clarify requirements during demolition activities would be sufficient to ensure compliance with all LORS.

Therefore, this Final Staff Assessment (FSA) indicates that with the continued implementation of the currently-required six (6) mitigation measures, worker safety and fire protection at the modified project site would not present a significant risk to on-site workers. These conditions would ensure that the most modern fire prevention, detection, and suppressions systems are installed and implemented. With adoption of the proposed conditions of certification, the ESPFM will comply with all applicable laws, ordinances, regulations, and standards and will not result in any unmitigated significant adverse impacts.

INTRODUCTION

On April 23, 2013, ESEC LLC filed a petition with the Energy Commission requesting to replace utility boiler Units 3 and 4 with one new combined cycle (consisting of a combustion turbine generator (Unit 9), and a one steam turbine generator (Unit 10)) and two simple-cycle combustion turbines (Units 11 and 12) for the project totaling 449 megawatt (MW) (NRG 2013a). The current amendment proposes the demolition of the existing steam boiler Units 3 and 4, to be replaced with combined cycle Units 9 and 10, with dry cooling technology, and simple cycle Units 11 and 12.

The proposed project is located within the existing 33-acre El Segundo Energy Center (ESEC) site. The site is located at the southernmost city limit of the city of El Segundo, on the coast of the Pacific Ocean, between Dockweiler State Beach and the city of Manhattan Beach, in Los Angeles County. See **Project Description Figures 1** and **2.**

The purpose of this Staff Assessment is to assess the worker safety and fire protection measures proposed by the ESPFM and to determine whether the project owner 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.

METHODOLOGY AND THRESHOLDS FOR DETERMINING ENVIRONMENTAL CONSEQUENCES

Two issues are assessed in **Worker Safety and Fire Protection**:

- The potential for adverse impacts on the safety of workers during demolition, construction, and operations activities, and
- Fire prevention/protection, emergency medical response, and hazardous materials spill response during construction and operations.

Worker safety issues are thoroughly addressed by the California Department of Occupational Safety and Health (Cal/OSHA) regulations. If all LORS are followed, workers will be adequately protected. Thus, the standard for staff's review and determination of significant impacts on workers is whether or not the project owner has demonstrated adequate knowledge about, and dedication to, implementing all pertinent and relevant Cal/OSHA standards.

Regarding fire prevention matters, staff reviews and evaluates the on-site fire-fighting systems proposed by the project owner and the time needed for off-site local fire departments to respond to a fire, medical, or hazardous material emergency at the proposed power plant site. If on-site systems do not follow established codes and industry standards, staff recommends additional measures. Staff reviews and evaluates the local fire department capabilities and response time in each area and interviews the local fire officials to determine if they feel adequately trained, manned, and equipped to respond to the needs of a power plant. Staff then determines if the presence of the power plant would cause a significant impact on a local fire department. If it does, staff will recommend that the project owner mitigate this impact by providing increased resources to the fire department.

Staff has also established a procedure when a local fire department has identified either a significant incremental project impact to the local agency or a significant incremental cumulative impact to a local agency. Staff first conducts an initial review of the position and either agrees or disagrees with the fire department's determination that a significant

impact would exist if the proposed power plant is built and operated. A process then starts whereby the project owner can either accept the determination made by staff or refute the determination by providing a Fire Needs Assessment and a Risk Assessment. The Fire Needs Assessment would address fire response and equipment/staffing/location needs while the Risk Assessment would be used to establish that while an impact to the fire department may indeed exist, the risk (chances) of that impact occurring and causing injury or death is less than significant.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS (LORS)

Worker Safety and Fire Protection Table 1 Laws, Ordinances, Regulations, and Standards (LORS)

Applicable LORS	Description
Federal	
Title 29 U.S. Code (USC) section 651 et seq (Occupational Safety and Health Act of 1970)	This act mandates safety requirements in the workplace with the purpose of "[assuring] 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).
Title 29 Code of Federal Regulation (CFR) sections 1910.1 to 1910.1500 (Occupational Safety and Health Administration Safety and Health Regulations)	These sections 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.
29 CFR sections 1952.170 to 1952.175	These sections provide 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 sections 1910.1 to 1910.1500.
State	
Title 8 California Code of Regulations (Cal Code Regs.) all applicable sections (Cal/OSHA regulations)	These sections require that all employers follow these regulations as they pertain to the work involved. This includes regulations pertaining to safety matters during construction, commissioning, and operations of power plants, as well as safety around electrical components, fire safety, and hazardous materials use, storage, and handling.
California Building Standards Code, 2013 edition. 24 Cal Code Regs. section 3, et seq.	This section incorporates the current edition of the International Building Code.
Health and Safety Code section 25500, et seq.	This section presents Risk Management Plan requirements for threshold quantities of listed acutely hazardous materials at a facility.
Health and Safety Code sections 25500 to 25541	These sections require a Hazardous Material Business Plan detailing emergency response plans for hazardous materials emergency at a facility.
Local (or locally enforced)	
City of El Segundo Municipal Code Title 13 Chapter 10: Fire Code	The City of El Segundo Fire Department enforces the 2013 version of the California Fire Code (City Ordinance 1488 adopted Nov. 5, 2013)
City of El Segundo Fire Department, Environmental Safety Division, Municipal Code	The City of El Segundo Fire Department (CESFD), Environmental Safety Division is the CUPA and therefore regulates RMPs (Article 8) and Underground Storage Tanks (Article B) which govern

Applicable LORS	Description
Title 5 Chapter 5	hazardous materials release response plans, inventories, and storage tanks.
NFPA 850	This industry standard of the National Fire Protection Association (NFPA) addresses fire protection at electrical generating stations.

PROPOSED MODIFIED PROJECT

ESEC LLC, a wholly owned subsidiary of NRG Energy, Inc. (NRG), proposes to make substantial changes to the ESEC. These changes are referred to as the ESPFM. Primary changes include the demolition and replacement of two once-through-cooled natural gas-fired utility boiler units (Units 3 and 4), with one new combined cycle generator (Unit 9 combustion turbine and Unit 10 steam turbine generator) and two simple-cycle gas turbines (Units 11 and 12). This change will eliminate the use of ocean water for once-through cooling at the facility. The proposed changes would also upgrade and improve the ESEC's existing and approved site infrastructure, provide fast start and dispatch flexibility capabilities to support Southern California grid load balancing and renewable energy integration, and implement improvements to coastal access. See **Project Description Figures 3**, **4**, **5**, **6** and **7.**

Specific changes proposed through this Petition to Amend (PTA) include:

- Shutdown and demolition of Units 3 and 4;
- Removal and remediation of existing ESEC retention basins;
- Construction of a new, combined administration, maintenance, and operations support building;
- Modifications to existing site access; and
- Improvements to beach access.

The following new major equipment would be installed:

- Unit 9 - One fast start combustion turbine in a combined-cycle configuration, rated at 222 MW net, incorporating a General Electric natural gas combustion turbine generator designed to achieve 75 percent of base load output in 10 minutes;
- As part of the combined cycle, one two-pressure, duct-fired heat recovery steam generator (HRSG) designed for rapid startup with conventional selective catalytic reduction system (SCR)/carbon monoxide (CO) catalysts;
- As part of the combined cycle, Unit 10 - One single-case, non-reheat axial exhaust admission condensing steam turbine generator (STG) rated at 112 MW and designed for non-traditional elevated condensing pressure to minimize cooling system size;
- One Heller dry cooling tower system;
- Units 11 and 12 - Two Rolls Royce Trent 60 generators, rated at a nominal 55 MW/unit net, consisting of advanced aeroderivative simple-cycle gas turbines; and

- One Cleaver Brooks auxiliary boiler consisting of a direct contact spray condenser and a mechanically-induced-draft dry-cooling tower.

SETTING AND EXISTING CONDITIONS

The proposed modified project is located wholly within the city of El Segundo and thus the city of El Segundo Fire Department (CESFD) is the Enforcing Agency and has within it the Fire Code Official under the California Fire Code. Fire support services would come from CESFD Fire Station No. 1 (located at 314 Main Street) which is the closest station to the site. 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 (CESFD 2001). Station 1 is also assigned as the off-site hazardous materials (hazmat) first responder for the ESEC. Station 1 has two designated hazmat personnel and is equipped with a hazmat engine. Station 1 firemen are also hazmat trained (CESFD 2001).

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

WORKER SAFETY

Industrial environments are potentially dangerous during demolition, construction, and operation of facilities. Workers at the proposed modified ESEC would be exposed to loud noises, moving equipment, trenches, and confined space entry and egress problems. The workers may experience falls, trips, burns, lacerations, and numerous other injuries. They have the potential to be exposed to falling equipment or structures, chemical spills, hazardous waste, fires, explosions, and electrical sparks and electrocution. It is important for the ESEC to have well-defined policies and procedures, training, and hazard recognition and control at its facility to minimize such hazards and protect workers. If the facility complies with all LORS and conditions of certification, workers would be adequately protected from health and safety hazards.

A Safety and Health Program would be prepared by the project owner to minimize worker hazards during demolition, construction, and operation. Staff uses the phrase “Safety and Health Program” to refer to the measures that would be taken to ensure compliance with the applicable LORS during the demolition/construction and operational phases of the project.

Demolition and Construction Safety and Health Program

Workers at the ESEC would be exposed to hazards typical of demolition, construction, and operation of a natural gas-fired electric power generating facility. During demolition and construction, one set of worker safety policies and procedures would be followed.

Construction Safety Orders are published at Title 8 California Code of Regulations sections 1502, et seq. These requirements are promulgated by Cal/OSHA and would be applicable to the construction phase of the project. The Construction Safety and Health Program would include the following:

- Demolition and Construction Injury and Illness Prevention Program (8 Cal Code Regs. §1509)
- Demolition and Construction Fire Prevention Plan (8 Cal Code Regs. §1920)
- Personal Protective Equipment Program (8 Cal Code Regs. §§1514-1522)
- Demolition and Emergency Action Program and Plan
- Demolition and Construction Fire Prevention Plan (8 Cal Code Regs 3221)

Additional programs under General Industry Safety Orders (8 Cal Code Regs. §§3200 to 6184), Electrical Safety Orders (8 Cal Code Regs. §§2299 to 2974) and Unfired Pressure Vessel Safety Orders (8 Cal Code Regs. §§450 to 544) would be established and implemented and would address many important worker safety and health issues. It is not staff's intent to list them all but some of the newer and revised Cal-OSHA regulations address such matters as excavation and trenching, employee exposure monitoring, hearing conservation, ergonomics, heat and cold stress monitoring and control, confined space entry, and Lock Out/Tag Out of dangerous operations and electrical circuits. Prior to the start of demolition and through construction, detailed programs and plans would be provided to the Energy Commission Compliance Project Manager (CPM) and to the CESFD pursuant to existing Condition of Certification **WORKER SAFETY-1**.

Operations and Maintenance Safety and Health Program

Prior to the start of operations at ESEC, the Operations and Maintenance Safety and Health Program would be prepared. This operational safety program would include the following programs and plans:

- Injury and Illness Prevention Program (8 Cal Code Regs. §3203)
- Fire Protection and Prevention Program (8 Cal Code Regs. §3221)
- Personal Protective Equipment Program (8 Cal Code Regs. §§3401 to 3411)
- Emergency Action Plan (8 Cal Code Regs. §3220)
- A Hazardous Materials Management Program

In addition, the requirements under General Industry Safety Orders (8 Cal Code Regs. §§3200 to 6184), Electrical Safety Orders (8 Cal Code Regs. §§2299 to 2974) and Unfired Pressure Vessel Safety Orders (8 Cal Code Regs. §§450 to 544) would be applicable to the project. Written safety programs for ESEC, which the project owner would develop, would ensure compliance with the above-mentioned requirements.

Prior to operation of ESEC, all detailed programs and plans would be provided to the CPM and the CESFD pursuant to existing Condition of Certification **WORKER SAFETY-2**.

Fire Prevention Plan

California Code of Regulations requires an Operations Fire Prevention Plan (8 Cal Code Regs. §3221). The plan would accomplish the following:

- determine general program requirements (scope, purpose, and applicability);
- determine potential fire hazards;
- develop good housekeeping practices and proper handling and materials storage;
- determine potential ignition sources and control measures for these sources;
- determine persons responsible for equipment and system maintenance;
- locate portable and fixed fire-fighting equipment in suitable areas;
- establish and determine training and instruction requirements; and
- define recordkeeping requirements.

Under the existing license for the project, the project owner is required to submit a final Fire Prevention Plan to the CPM for review and approval and to the CESFD for review and comment to satisfy existing Conditions of Certification **WORKER SAFETY-1** and **WORKER SAFETY-2**.

Additional Mitigation Measures

Protecting construction workers from injury and disease is among the greatest challenges in occupational safety and health. The following facts are reported by the National Institute for Occupational Safety and Health (NIOSH):

- More than 7 million persons work in the construction industry, representing 6 percent of the labor force. Approximately 1.5 million of these workers are self-employed.
- Of approximately 600,000 construction companies, 90 percent employ fewer than 20 workers. Few have formal safety and health programs.
- From 1980 to 1993, an average of 1,079 construction workers were killed on the job each year—more fatal injuries than in any other industry.
- Falls caused 3,859 construction worker fatalities (25.6 percent) between 1980 and 1993.
- Construction injuries account for 15 percent of workers' compensation costs.
- Assuring safety and health in construction is complex, involving short-term work sites, changing hazards, and multiple operations and crews working in close proximity.
- In 1990, Congress directed NIOSH to undertake research and training to reduce diseases and injuries among construction workers in the United States. Under this mandate, NIOSH funds both intramural and extramural research projects.

The hazards associated with the construction industry are thus well documented. These hazards increase in complexity in the multi-employer worksites typical of large, complex, industrial-type projects such as the construction of natural gas-fired power plants. In order to reduce and/or eliminate these hazards, it has become standard industry practice to hire a Construction Safety Supervisor to ensure a safe and healthful environment for all personnel. That this standard practice has reduced and/or eliminated hazards has been

evident in the audits staff recently conducted of power plants under construction. The federal Occupational Safety and Health Administration (OSHA) has also entered into strategic alliances with several professional and trade organizations to promote and recognize safety professionals trained as Construction Safety Supervisors, Construction Health and Safety Officers, and other professional designations. The goal of these partnerships is to encourage construction subcontractors in four areas:

- to improve their safety and health performance;
- to assist them in striving for the elimination of the four hazards (falls, electrical, caught in/between and struck-by hazards), which account for the majority of fatalities and injuries in this industry and have been the focus of targeted OSHA inspections;
- to prevent serious accidents in the construction industry through implementation of enhanced safety and health programs and increased employee training; and
- to recognize those subcontractors with exemplary safety and health programs.

To date, there are no OSHA or Cal/OSHA requirements that an employer hire or provide for a Construction Safety Officer. OSHA and Cal/OSHA regulations do, however, require that safety be provided by an employer and the term *Competent Person* is used in many OSHA and Cal/OSHA standards, documents, and directives. A Competent Person is usually defined by OSHA as an individual who, by way of training and/or experience, is knowledgeable of standards, is capable of identifying workplace hazards relating to the specific operations, is designated by the employer, and has authority to take appropriate action. Existing Condition of Certification **WORKER SAFETY-4** requires the project owner to designate and provide for a power plant site Construction Safety Supervisor which serves as the Competent Person during both demolition and construction activities as required by OSHA and Cal/OSHA. Staff does not propose any changes to this condition.

As discussed above, the hazards associated with the construction industry are well documented. These hazards increase in complexity in the multi-employer worksites typical of large, complex, industrial-type projects such as the demolition and construction of power plants.

Accidents, fires, and a worker death have occurred at Energy Commission-certified power plants in the past due to the failure to recognize and control safety hazards and the inability to adequately supervise compliance with occupational safety and health regulations. Safety problems have been documented by Energy Commission staff in safety audits conducted in 2005 (and later) at several power plants under construction. The findings of the audit staff include, but are not limited to, such safety oversights as:

- lack of posted confined space warning placards/signs;
- confusing and/or inadequate electrical and machinery lockout/tagout permitting and procedures;

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

In order to reduce and/or eliminate these hazards, it is necessary for the Energy Commission to have a professional Safety Monitor on site to track compliance with Cal/OSHA regulations and periodically audit safety compliance during both demolition and construction activities, commissioning, and for the hand-over to operational status. (The project owner is relieved of the duty to provide a Safety Monitor once all demolition and construction activities are completed.) These requirements are outlined in existing Condition of Certification **WORKER SAFETY-5**. A Safety Monitor, hired by the project owner, yet reporting to the Chief Building Official (CBO) and CPM, would serve as an "extra set of eyes" to ensure that safety procedures and practices are fully implemented at all power plants certified by the Energy Commission. During the audits conducted by staff, most site safety professionals welcomed the audit team and actively engaged it in questions about the team's findings and recommendations. These safety professionals recognized that safety requires continuous vigilance and that the presence of an independent audit team provided a fresh perspective of the site. Staff does not propose any changes to existing **WORKER SAFETY-5**.

FIRE PROTECTION

During demolition, construction and operation of the modified ESEC, there is the potential for both small fires and major structural fires. Electrical sparks, combustion of fuel oil, natural gas or flammable liquids, explosions, and over-heated equipment may cause small fires. Major structural fires may develop from uncontrolled fires or be caused by large explosions of natural gas or other flammable gasses or liquids. Compliance with all LORS would be adequate to assure protection from all fire hazards.

The project would 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 (CESFD).

As mentioned above in this section of the FSA, fire support services from the CESFD would come from Fire Station No. 1, which is the closest station to the site and is located at 314 Main Street, and from Station 2, located at 2161 El Segundo Boulevard. The response times to the project site of less than 3-5 minutes and 4-5 minutes, respectively, (CESFD 2001) are adequate. Station 1 is also assigned as the off-site hazardous materials (hazmat) first responder for the ESEC. Station 1 has two designated hazmat personnel and is equipped with a hazmat engine. Station 1 firemen are also hazmat trained (CESFD 2001).

Staff reviewed the information provided in the PTA regarding available fire protection services and equipment (NRG 2013a, p. 2-24) to determine if the project would adequately protect workers and if it would affect the fire protection services in the area.

The fire protection systems limit personnel injury, loss of life, property loss, and plant downtime due to fire. According to the PTA, the existing power plant firewater system had been upgraded significantly as part of the ESEC project but the location of the existing firewater storage tank and electric motor-driven firewater pump would not change. The firewater supply and pumping system is dedicated solely to fire fighting needs and would provide the required quantity of fire-fighting water to yard hydrants, hose stations, and water spray and sprinkler systems.

There are currently two sources of firewater and these sources would remain: the primary source is the existing firewater storage tank and the secondary source is the water main from the city of Manhattan Beach. A diesel engine-driven pump would take water from the city water line and would also operate as the backup pump to the electric pump for the water tank. Both pumps are capable of supplying maximum water demand for any automatic sprinkler system plus water for fire hydrants and hose stations.

The new firewater distribution system required for Units 5, 6, 7 and 8, proposed Units 9, 10, 11 and 12, the new administration building, maintenance shop, and warehouse, would be incorporated into the existing firewater distribution system. This added demand would not, according to the PTA, affect the ability of the existing fire water loop system and thus water flow and pressure would be maintained as per code. Isolation valves in the firewater loop and system would be added to isolate any failure in one part of the system.

Fire hydrants with hose houses would be spaced at approximately 250-foot intervals around the fire loop as per local fire codes. Fixed fire protection systems would be provided for the steam turbine bearings and lube oil equipment and station transformers. In addition to the fixed fire protection system, portable CO_2 and dry chemical extinguishers would be located throughout the plant (including the switchgear rooms).

The PTA indicates that the administration and maintenance building would be relocated to the existing tank farm area on the southern portion of the site. Staff supports this change in that it would enable improved access for facility and emergency services personnel, and visitors and allow visitor access to the site without vehicles having to traverse through the northern portion of the site from the site entrance. The improved

access would allow for a direct and straight route from the main site entrance to the newly located administration and maintenance building.

Staff concludes that the information in the PTA indicates that the project intends to meet the fire protection and suppression requirements of all applicable LORS. As per Condition of Certifications **WORKER SAFETY-1** and **-2**, the project owner would be required to provide a Fire 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.

Emergency Medical Services Response

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

Staff believes that existing Condition of Certification **WORKER SAFETY-6,** which requires an AED on the site be retained and that certain power plant employees on site during demolition, construction, and operations be trained in its use.

CUMULATIVE IMPACT ANALYSIS

Staff concludes that due to the nature of worker safety and the required adherence by each individual employer to LORS, there is no cumulative impact on worker safety regardless of the number of projects in an area. Therefore, only potential cumulative impacts on fire protection are analyzed.

Staff has analyzed the potential for fire protection cumulative impacts at many other power plant projects located in California and in the region of the proposed ESEC. A significant cumulative fire protection impact is defined as the simultaneous emergency at multiple locations that would require the concurrent response for rescue, fire fighting,

hazardous materials spill control, and/or EMS response. Existing locations that would likely need emergency response, or locations where such facilities might likely be built, were both considered.

The **Executive Summary** section of this document provides detailed information on the potential cumulative projects in the project area (see **Table-1, Master List of Cumulative Projects**). Staff reviewed 30 projects that were deemed completed, planned, or foreseeable. Staff notes that all of these projects or developments in the area or region already have or will need emergency response and fire protection plan reviews and emergency response services provided by the local fire authority, be it the CESFD or that of another jurisdiction such as the nearby Manhattan Beach Fire Department. The need for rescue, fire, hazardous materials, and EMS response is necessary in this area but not particularly frequent at the current power plant facility. All the projects identified in Table-1, as well as other area power plants that are operating, under construction, or proposed, have had any direct fire protection impacts mitigated to a level of less than significant.

Staff believes that while cumulative impacts are theoretically possible, they are not probable because of the many safeguards implemented to both prevent and control the industrial environment, spills, and fires. The chances of one event at any industrial location requiring a concerted response from the CESFD is high because accidents do happen in industrial environments. However, the chance of two or more occurring simultaneously, with resulting draw-down of fire department resources to the point of endangering this or other communities with lack of fire department coverage, is real but not high. Staff believes the risk of draw-down due to an event at the proposed ESEC is less than significant and thus cumulative impacts are also less than significant impact.

The project owner would develop and implement a fire protection program for the ESEC independent of any other projects considered for potential cumulative impacts. Staff believes that the facility, as proposed by the project owner and with the additional mitigation measures proposed by staff, poses a less than significant risk.

- Based upon staff's experience with power plants around the state and the historical record of seismic events, staff concludes that while it is possible that during a major earthquake response to the power plant could have a cumulative impact on the CESFD, the probability of that happening is less than significant given the many fire detection and suppression systems, as well as shut-off valves and other controls that would exist at the modified ESEC. Staff believes that other industrial, commercial, and residential environments would pose a greater challenge during a major seismic event than the proposed ESEC facility. Therefore, this project would not have a significant incremental direct or cumulative impact on the fire department's ability to respond to a fire or other emergency and no mitigation is required.

- The CESFD has stated in the past that its ability to respond to emergency calls would not be affected by the construction and operation of the existing power plant (CESFD 2001) and staff concludes that this would hold true for the modified ESEC facility. Therefore, staff finds that no mitigation is required.

COMPLIANCE WITH LORS

Staff concludes that demolition, construction, and operation of the ESEC project would be in compliance with all applicable LORS regarding long-term and short-term project impacts in the areas of worker safety and fire protection.

NOTEWORTHY PUBLIC BENEFITS

The demolition, construction, and operation activities proposed for the modified ESEC, requires in general, smaller quantities of hazardous materials and materials that are less dangerous to the public than the previously-licensed natural-gas fired power plant currently operating on the site (such as the discontinued use aqueous hydrazine). Building this modified power plant would supply required energy in California more efficiently using modern fast-start technology while at the same time reduce the risks of fire and hazardous materials spills.

RESPONSE TO AGENCY AND PUBLIC COMMENTS

No comments on worker safety or fire protection issues have been received at this time from agencies or the public.

CONCLUSIONS

Staff concludes that existing Conditions of Certifications **WORKER SAFETY-1** through **WORKER SAFETY-6** are adequate to ensure adequate levels of industrial safety and comply with applicable LORS with only minor amendments to reflect current nomenclature, current Energy Commission practice, and to clarify requirements during demolition activities. (revisions are in ~~strikeout~~ or **bold underline**)

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 ~~Safety Program~~ **Illness and Injury 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 Prevention Plan.

The ~~Safety Program~~ Personal Protective Equipment Program, the Exposure Monitoring Program, the Heat Stress Protection Plan, and the **Injury and Illness Prevention Program** shall be submitted to the CPM for review and approval concerning compliance of the program with all applicable safety

orders. The Demolition and Construction Emergency Action Plan and the Fire Prevention Plan shall be submitted to the City of El Segundo Fire Department (CESFD) for review and comment prior to submittal to the CPM for approval.

The Demolition and Construction Fire Protection and Prevention Plan and Emergency Action Plan shall include the following:

1. Methods to maintain fire access roadways and submittal of a fire access layout plan for review by the El Segundo Fire Department and approval by the CPM.
2. Provision of a suitable replacement for the existing fire suppression water reservoir prior to demolishing the existing reservoir.
3. Provision of fire flow calculations to verify that the available water supply proposed will be adequate for emergency operations.
4. A requirement that all temporary fire mains and hydrants shall be adequately braced and tied-down to anticipate the effects of water hammer and that protection from vehicular impact is provided as necessary.

Verification: At least 30 days prior to **commencement of demolition activities or** site mobilization **for construction**, **whichever occurs first,** 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 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;
- ~~Operations and Maintenance Safety Program;~~
- Fire Protection and Prevention Program (8 CCR § 3221); and;
- Personal Protective Equipment Program (8 CCR §§ 3401-3411).

The Operation Injury and Illness Prevention Plan, Emergency Action Plan, and Personal Protective Equipment Program shall be submitted to the CPM for review and comment concerning compliance of the programs with all applicable safety orders. The Fire Prevention Plan and the Emergency Action Plan shall also be submitted to the CESFD for review and comment.

The Project Operations Fire Protection and Prevention Plan and Emergency Action Plan shall address:

1. Provision of remote annunciation for all fire alarm and automatic suppression devices and the placement of remote annunciation at the security station on Vista Del Mar.

2. Provision of a complete fire alarm system and automatic fire sprinklers for the new administration building and any new control buildings.

3. A secondary entrance point for Fire Department operations along the northern boundary of the property.

Verification: At least 30 days prior to the start of operation, the project owner shall submit to the CPM and the CESFD 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.

WORKER SAFETY-4 The project owner shall provide a site Construction Safety Supervisor (CSS) who, by way of training and/or experience, is knowledgeable of power plant construction activities and relevant laws, ordinances, regulations, and standards, is capable of identifying workplace hazards relating to the construction activities, and has authority to take appropriate action to assure compliance and mitigate hazards. The CSS shall:

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

Verification: At least thirty (30) days prior to the **commencement of demolition activities or start of** project mobilization **for construction**, **whichever occurs first**, the project owner shall submit to the CPM the name and contact information for the Construction Safety Supervisor (CSS). The contact information of any replacement (CSS) shall be submitted to the CPM within one business day.

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

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

WORKER SAFETY-5 The project owner shall make payments to the Chief Building Official (CBO) for the services of a Safety Monitor based upon a reasonable fee schedule to be negotiated between the project owner and the CBO. Those services shall be in addition to other work performed by the CBO. The Safety Monitor shall be selected by and report directly to the CBO, and will be responsible for verifying that the Construction Safety Supervisor, as required in **Worker Safety-4**, implements all appropriate Cal/OSHA and Commission safety requirements. The Safety Monitor shall conduct on-site (including linear facilities) safety inspections **during demolition and construction** at intervals necessary to fulfill those responsibilities.

Verification: Prior to the **commencement of demolition activities or** start of construction, **whichever occurs first**, the project owner shall provide proof of its agreement to fund the Safety Monitor services to the CPM for review and approval.

WORKER SAFETY-6 The project owner shall ensure that a portable automatic cardiac defibrillator (also known as an automatic external defibrillator or AED) is located on site during **demolition,** construction, and operations and shall implement a program to ensure that workers are properly trained in its use and that the equipment is properly maintained and functioning at all times. During **demolition,** construction, and commissioning, the following persons shall be trained in its use and shall be on-site whenever the workers that they supervise are on-site: the Construction Project Manager or delegate, the Construction Safety Supervisor or delegate, and all shift foremen **during demolition and construction activities**. During operations, all power plant employees shall be trained in its use. The training program shall be submitted to the CPM for review and approval.

Verification: At least thirty (30) days prior to the start of **commencement of demolition activities or** start of construction mobilization, **whichever occurs first**, the project owner shall submit to the CPM proof that a portable automatic cardiac defibrillator exists on site and a copy of the training and maintenance program for review and approval.

REFERENCES

CEC 2005a- CEC (CEC-800-2005-001-CMF). El Segundo Power Redevelopment Project Commission Decision, dated 2/2005.

CEC 2010a- CEC (CEC-800-2010-015). El Segundo Power Redevelopment Project Amendment Commission Decision, dated 6/2010.

City of El Segundo Fire Department (CESFD). 2001. Personal communication with Rosemarie Radomsky, Administrative Specialist. April 25, 2001.

NRG 2013a- NRG / El Segundo Energy Center LLC (TN 70442) Petition to Amend, dated April 2013. Submitted to CEC on 04/23/2013.

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

ENGINEERING ASSESSMENT

FACILITY DESIGN

Testimony of Edward Brady and Shahab Khoshmashrab

SUMMARY OF CONCLUSIONS

Based on the review of the Petition to Amend (PTA) for the El Segundo Power Facility Modification (ESPFM) project, the California Energy Commission staff concludes that the design, construction, and eventual closure of the project and its linear facilities would likely comply with applicable engineering laws, ordinances, regulations and standards (LORS). The proposed conditions of certification, below, would ensure compliance with these LORS.

INTRODUCTION

Facility design encompasses the civil, structural, mechanical, and electrical engineering design of the last phase of the El Segundo Energy Center (ESEC) project, which is designated ESPFM. The purpose of this analysis is to:

- Verify that the LORS that apply to the engineering design and construction of the project have been identified;
- Verify that both the project and its ancillary facilities are sufficiently described, including proposed design criteria and analysis methods, in order to provide reasonable assurance that the project will be designed and constructed in accordance with all applicable engineering LORS, in a manner that also ensures the public health and safety;
- Determine whether special design features should be considered during final design to address conditions unique to the site which could influence public health and safety; and
- Describe the design review and construction inspection process and establish the conditions of certification used to monitor and ensure compliance with the engineering LORS, in addition to any special design requirements.

Subjects discussed in this analysis include:

- Identification of the engineering LORS that apply to facility design;
- Evaluation of the project owner's proposed design criteria, including identification of criteria essential to public health and safety; and
- Conditions of Certification proposed by the California Energy Commission (Energy Commission) staff, to ensure that the project will be designed and constructed to ensure public health and safety and comply with all applicable engineering LORS.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)

Lists of LORS applicable to each engineering discipline (civil, structural, mechanical, and electrical) are described in the PTA for the ESPFM (NRG 2013a, § 1.10). Key LORS are listed in **FACILITY DESIGN Table 1,** below:

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

Applicable LORS	Description
Federal	Title 29 Code of Federal Regulations (CFR), Part 1910, Occupational Safety and Health standards
State	2013 (or the latest edition in effect) California Building Standards Code (CBSC) (also known as Title 24, California Code of Regulations)
Local	City of El Segundo regulations and ordinances
General	American National Standards Institute (ANSI) American Society of Mechanical Engineers (ASME) American Welding Society (AWS) American Society for Testing and Materials (ASTM)

The following conditions of certification require the project to comply with the California Building Standards Code and city of El Segundo regulations and ordinances to ensure that the project would be built to applicable engineering codes and ensure public health and safety.

For the project to be built in a manner that would ensure public health and safety and operational integrity of project equipment, the LORS listed above in **FACILITY DESIGN Table 1** under the "General" heading, must also be met. The LORS listed under this heading are only some of the key engineering standards applicable to the project.

SETTING

On April 23, 2013, El Segundo Energy Center, L.L.C. (ESEC LLC) filed the ESPFM PTA with the Energy Commission. This PTA requests to replace the existing utility boilers, or Units 3 and 4 at the ESEC with one new combined cycle train consisting of one natural gas combustion turbine generator (CTG), one heat recovery steam generator (HRSG) and one steam turbine generator (STG), and two new simple cycle gas turbines. The PTA also proposes the replacement of a once-through seawater cooling system with dry-cooling technology. The new combined cycle is designated Unit 9 for the CTG and Unit 10 for the HRSG and STG. The two simple cycle gas turbines are designated Units 11 and 12.

The ESPFM would be built on the ESEC site, an existing and operating power plant in the city of El Segundo. For more information on the site and its related project description, please see the **Project Description** section of this document.

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

The purpose of this analysis is to ensure that the project would be built to applicable engineering codes and ensure public health and safety. This analysis further verifies that applicable engineering LORS have been identified and that the project and its ancillary facilities have been described in adequate detail. It also evaluates the project owner's proposed design criteria, describes the design review and construction inspection process, and establishes conditions of certification that would monitor and ensure compliance with engineering LORS and any other special design requirements. These conditions allow both the Energy Commission compliance project manager (CPM) and the project owner to adopt a compliance monitoring program that will verify compliance with these LORS.

SITE PREPARATION AND DEVELOPMENT

Staff has evaluated the proposed design criteria for grading, flood protection, erosion control, site drainage, and site access, in addition to the criteria for designing and constructing linear support facilities such as natural gas and electric transmission interconnections. The project owner proposes the use of accepted industry standards (see NRG 2013a, §1.10), for a representative list of applicable industry standards, design practices, and construction methods in preparing and developing the site. Staff concludes that this project, including its linear facilities, would most likely comply with all applicable site preparation LORS. To ensure compliance, staff proposes the conditions of certification listed below and in the **Geology and Paleontology** section of this document.

MAJOR STRUCTURES, SYSTEMS, AND EQUIPMENT

Major structures, systems, and equipment are structures and their associated components or equipment that are necessary for power production, costly or time consuming to repair or replace, are used for the storage, containment, or handling of hazardous or toxic materials, or could become potential health and safety hazards if not constructed according to applicable engineering LORS.

The ESPFM would be designed and constructed to the 2013 California Building Standards Code (CBSC), also known as Title 24, California Code of Regulations, which encompasses the California Building Code (CBC), California Building Standards Administrative Code, California Electrical Code, California Mechanical Code, California Plumbing Code, California Energy Code, California Fire Code, California Code for Building Conservation, California Reference Standards Code, and other applicable codes and standards in effect when the design and construction of the project actually begin. If the initial designs are submitted to the chief building official (CBO) for review and approval after the update to the 2013 CBSC takes effect, the 2013 CBSC provisions shall be replaced with the updated 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 according to their appropriate lateral force procedure, staff has included Condition of Certification **STRUC-**

1, below, which, in part, requires the project CBO's review and approval of the owner's proposed lateral force procedures before construction begins.

PROJECT QUALITY PROCEDURES

As with the original ESEC project, staff expects that similar quality assurance and quality control programs will be employed to ensure the project's systems and components will be designed, fabricated, stored, transported, installed, and tested in accordance with all appropriate power plant technical codes and standards. Compliance with design requirements would be verified through specific inspections and audits. Implementation of these quality assurance and quality control programs would ensure that ESPFM is actually designed, procured, fabricated, and installed as described in this analysis.

COMPLIANCE MONITORING

Under Section 104 of the 2013 CBC, the CBO is authorized and directed to enforce all provisions of the CBC. The Energy Commission itself serves as the building official, and has the responsibility to enforce the code, for all of the energy facilities it certifies. In addition, the Energy Commission has the power to interpret the CBC and adopt and enforce both rules and supplemental regulations that clarify application of the CBC's provisions.

The Energy Commission's design review and construction inspection process conforms to CBC requirements and ensures that all Facility Design Conditions of Certification are met. As provided by Section 103 of the 2013 CBC, the Energy Commission appoints experts to perform design review and construction inspections and act as delegate CBOs on behalf of the Energy Commission. These delegates may include the local building official and/or independent consultants hired to provide technical expertise that is not provided by the local official alone. The project owner, through permit fees provided by the CBC, pays the cost of these reviews and inspections. While building permits in addition to Energy Commission certification are not required for this project, the project owner pays in lieu of CBC permit fees to cover the costs of these reviews and inspections.

Engineering and compliance staff will invite the city of El Segundo or a third-party engineering consultant to act as CBO for this project. When an entity has been assigned CBO duties, Energy Commission staff will complete a memorandum of understanding (MOU) with that entity to outline both its roles and responsibilities and those of its subcontractors and delegates.

Staff has adopted the conditions of certification included in the original Energy Commission Decision for the ESEC (CEC 2005) to ensure protection of public health and safety and compliance with engineering design LORS. Some of these conditions address the roles, responsibilities, and qualifications of the engineers who would design and build the proposed project (Facility Design Conditions of Certification **GEN-1** through **GEN-8**). These engineers must be registered in California and sign and stamp every submittal of design plans, calculations, and specifications submitted to the CBO. These conditions require that every element of the project's construction (subject to

CBO review and approval) be approved by the CBO before it is performed. They also require that qualified special inspectors perform or oversee special inspections required by all applicable LORS.

While the Energy Commission and delegate CBO have the authority to allow some flexibility in scheduling construction activities, these conditions are written so that no element of construction (of permanent facilities subject to CBO review and approval) which could be difficult to reverse or correct can proceed without prior CBO approval. Elements of construction that are not difficult to reverse may proceed without approval of the plans. The project owner bears the responsibility to fully modify construction elements in order to comply with all design changes resulting from the CBO's subsequent plan review and approval process.

FACILITY CLOSURE AND NON-OPERATION

Facility closure is defined in the **Compliance Conditions and Compliance Monitoring Plan** section of this document, as a facility shutdown with no intent to restart operation. It may also be the cumulative result of unsuccessful efforts to re-start over an increasingly lengthy period of non-operation, condemned by inadequate means and/or lack of a viable plan. Facility closures can occur due to a variety of factors, including, but not limited to, irreparable damage and/or functional or economic obsolescence.

Non-operation is defined in the **Compliance Conditions and Compliance Monitoring Plan** section as a time-limited event, and can encompass part, or all, of a facility. Non-operation can be a planned event, usually for minor equipment maintenance or repair, or unplanned, usually the result of unanticipated events or emergencies. Future conditions that could affect facility closure and non-operation are largely unknown at this time.

In order to ensure that facility closure and non-operation would be completed in a manner that is environmentally sound, safe, and protects the public health and safety, the project owner must submit a closure plan to the Energy Commission for review and approval prior to the commencement of closing the facility, as required in Condition of Certification **COM-14** (Non-Operation) and **COM-15** (Facility Closure Planning) in the **Compliance Conditions and Compliance Monitoring Plan** section of this document.

The requirements in the **Compliance Conditions and Compliance Monitoring Plan** section of this documentare adequate protection, even in the unlikely event of project abandonment.

NOTEWORTHY PUBLIC BENEFITS

Staff has identified no noteworthy public benefits in the area of Facility Design.

RESPONSE TO AGENCY AND PUBLIC COMMENTS

Staff has not received any public or agency comments in the area of Facility Design.

CONCLUSIONS AND RECOMMENDATIONS

- The LORS identified in the PTA and supporting documents directly apply to the project.
- 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 will likely comply with applicable engineering LORS.
- The existing conditions of certification will ensure the ESPFM is designed and constructed in accordance with applicable engineering LORS. This will be accomplished through design review, plan checking, and field inspections that will be performed by the CBO or other Energy Commission delegate. Staff will audit the CBO to ensure satisfactory performance.
- Though future conditions that could affect facility closure and non-operation are largely unknown at this time, it can reasonably be concluded that if the project owner complies with Condition of Certification **COM-14** (Non-Operation) and submits a facility closure plan as required by Condition of Certification **COM-15**, as provided in the **Compliance Conditions and Compliance Monitoring Plan** section of this document, prior to decommissioning, decommissioning procedures will comply with all applicable engineering LORS.

Energy Commission staff recommends that:

1. The following conditions of certification be adopted to ensure that the project is designed and constructed in a manner that protects the public health and safety and complies with all applicable engineering LORS;
2. The project be designed and built to the 2013 CBSC (or successor standards, if in effect when initial project engineering designs are submitted to the CBO for review); and
3. The CBO reviews the final designs, checks plans, and performs field inspections during construction. Energy Commission staff shall audit and monitor the CBO to ensure satisfactory performance.

CONDITIONS OF CERTIFICATION

Following are the existing conditions of certification applicable to the ESPFM with the following revisions. The compliance requirements for facility design designated Conditions of Certification **GEN-1** through **GEN-8**, **CIVIL-1** through **CIVIL-4**, **STRUC-1** through **STRUC-4**, **MECH-1** through **MECH-3**, and **ELEC-1** have been revised accordingly. These revisions include:

- Updating the applicable version and section references of the California Building Standards Code.
- Updating Condition of Certification **GEN-2** to reflect the equipment proposed for the new Units 9 through 12 as specified in **GEN-2**, **Table 1**: **Major Structures and Equipment List**.
- The building code requires that the minimum electrical load for electrical equipment and systems requiring CBO review and inspection is 120 volts, not 480 volts as currently stated in Condition of Certification **ELEC-1**; **ELEC-1** has been revised accordingly.

The added text is identified as **bold** and **underlined**, and the deleted text is identified as ~~strikethrough~~.

GEN-1 The project owner shall design, construct and inspect the project in accordance with the **2013** ~~2007~~ edition of the California Building Standards Code (CBSC) (also known as Title 24, California Code of Regulations), which encompasses the California Building Code (CBC), California Building Standards Administrative Code, California Electrical Code, California Mechanical Code, California Plumbing Code, California Energy Code, California Fire Code, California Code for Building Conservation, California Reference Standards Code, and all other applicable LORS in effect at the time initial design plans are submitted to the CBO for review and approval. (The CBSC 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 covered by the Transmission System Engineering Conditions of Certification.

In the event that the initial engineering designs are submitted to the CBO when a successor to the **2013**~~2001~~CBSC is in effect, the **2013**~~2001~~ CBSC provisions identified herein shall be replaced with the applicable successor provisions. Where, in any specific case, different sections of the code specify different materials, methods of construction, or other requirements, the most restrictive shall govern. Where there is a conflict between a general requirement and a specific requirement, the specific requirement shall govern.

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 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 [**2013**~~2007~~ CBC, Section ~~109~~**111** – 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	**Quantity**
Gas Turbine Enclosure	2
Gas Turbine Inlet Filter	2
Electrical Package	2
Lube Oil Cooler	2
Rotor Air Cooler (Fin-Fan)	2
Heat Recovery Steam Generator	2
HRSG Stack	2
Boiler Blow Down	2
Boiler Feedwater Pumps	2
Sampling Panel	2
Continuous Emissions Monitoring	2
SCR Skid	2
MV Switchgear	2
Generator Circuit Breaker	2
Auxiliary Transformer	2
Generator Transformer - Gas Turbine	2
Generator Transformer - Steam Turbine	2
Oil/Water Separator	2
Steam Turbine PCC	2
Gland Steam Condensers	2
Steam Turbine	2
ST Lube Oil Cooler	2
Steam Turbine Fin Fan Cooler	2
Condensate Polishing Fin Fan Cooler	2
Air Compressor Area	2
Balance of Plant PCC	2
Chemical Dosing Equipment	2
Deaerator / Drain Tanks / Condensate Pumps	2
Fuel Gas Conditioning/metering	1
Fuel Gas Compressors	2
Raw Water Water Tank	1
Demineralized Water Tank	1
Raw Water Forwarding Pumps	2
Electric Fire Water Pumps	1
Demineralized Water Forwarding Pumps	2
Fire Water Tank	1

Table 1: Major Structures and Equipment List	
Equipment	**Quantity**
Gas Turbine	3
Gas Inlet Filter	3
Lube Oil Cooler	3
Heat Recovery Steam Generator	1
HRSG Stack	1
Boiler Blow Down	1
Boiler Feedwater Pumps	1
Continuous Emissions Monitoring	3
SCR Skid	2
Generator Circuit Breaker	3
Step-up Transformer	3
Generator Transformer - Gas Turbine	3
Generator Transformer - Steam Turbine	1
Oil/Water Separator	3
Air Cooled Condenser	1
Steam Turbine	1
ST Lube Oil Cooler	1
Air Compressor Area	1
Administration Building/O&M Building	1
Chemical Dosing Equipment	3
Circulating Water Pumps	2
Fuel Gas Conditioning/Metering	1
Fuel Gas Compressors	4
Raw Water Tank	1
Demineralized Water Tank	1
Fire Water Tank	1
Auxiliary Boilers	1
Drainage Systems (Including DWV)	1 Lot
High Pressure and Large Diameter Piping	1 Lot
HVAC and Refrigeration Systems	1 Lot
Temperature Control and Ventilation Systems	1 Lot
Building Energy Conservation Systems	1 Lot
Switchyard, Busses and Towers	1 Lot
Electrical Duct Banks	1 Lot

GEN-3 The project owner shall make payments to the CBO for design review, plan check and construction inspection based upon a reasonable fee schedule to be negotiated between the project owner and the CBO. These fees may be consistent with the fees listed in the **2013**~~2001~~ CBC [Chapter 1, Section **109**~~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 (California Code of Regulations, title 24, § 4-209, Designation of Responsibilities).] All transmission facilities (lines, switchyards, switching stations, and substations) are covered by the **Transmission System Engineering** Conditions of Certification.

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 **S**~~s~~ection 6704 et seq., and **S**~~s~~ections 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 covered by the **Transmission System Engineering** Conditions of Certification.

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 [**2013**~~1998~~ CBC, Section **104** ~~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 **2013**~~1998~~ CBC, ~~Appendix~~ Chapter **18**~~33~~, Section **1803**~~ 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 **2013**~~1998~~ CBC, ~~Appendix~~ Chapter **17**~~33~~, **S**~~s~~ection **1704**~~3317~~ **Special Inspection**~~, 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 **2013**~~1998~~ CBC, Chapter 18, **S**~~s~~ection **1803.6**~~1804~~, **Reporting**~~ 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 [**2013**~~1998~~ CBC, **S**~~s~~ection 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 to all the mechanical engineering design requirements set forth in the Energy Commission Decision.

E: The electrical engineer shall:

1. Be responsible for the electrical design of the project; and
2. Sign and stamp electrical design drawings, plans, specifications, and calculations.

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

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

GEN-6 Prior to the start of an activity requiring special inspection, the project owner shall assign to the project, qualified and certified special inspector(s) who shall be responsible for the special inspections required by the **2013**~~1998~~ CBC, Chapter 17, Section 1701, Special Inspections, Section, 1701.5 Type of Work (requiring special inspection), and Section **110**~~106.3.5~~, **Structural Tests and Special Inspections** ~~Inspection and observation program~~. All transmission facilities (lines, switchyards, switching stations, and substations) are covered by the **Transmission System Engineering** Conditions of Certification.

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 [**2013**~~1998~~ CBC, Section **110**~~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 [**2013**~~1998~~ CBC, Section **107.5**~~106.4.2~~, Retention of Plans].

Verification: Within 15 days of the completion of any work, the project owner shall submit to the CBO, with a copy to the CPM in the next Monthly Compliance Report, (a) a written notice that the completed work is ready for final inspection, and (b) a signed statement that the work conforms to the final approved plans. After storing final approved engineering plans, specifications and calculations as described above, the project owner shall submit to the CPM a letter stating that the above documents have been stored and indicate the storage location of such documents.

CIVIL-1 Prior to the start of site grading, the project owner shall submit to the CBO for review and approval the following:

1. Design of the proposed drainage structures and the grading plan;
2. An erosion and sedimentation control plan;
3. Related calculations and specifications, signed and stamped by the responsible civil engineer; and
4. Soils report as required by the **2013**~~1998~~ CBC [~~Appendix~~ Chapter ~~33~~, Section ~~3309.5~~ **1803.6**, **Reporting** ~~Soils Engineering Report~~ and Section **1803**~~3309.6~~, **Geotechnical Investigation** ~~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 [**2013**~~1998~~ CBC, Section **115**~~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 **2013**~~1998~~ CBC, Chapter 1, Section **110**~~108~~, Inspections; Chapter 17, Section

1704~~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 noncompliance 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 [**2013**~~1998~~ CBC, Section **111**~~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 [**2013**~~1998~~ CBC, Section **104.1** ~~108.4~~, **Duties and Powers of Building Official 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 [**2013**~~1998~~ CBC, Section **107.5**~~106.4.2~~, Retention of plans and Section **107**~~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 [**2013**~~1998~~ CBC, Section **107.3.4**~~106.3.4~~, **Design Professionals in Responsible Charge** ~~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 Condition of Certification **GEN-2**, above, the project owner shall submit to the CBO, with a copy to the CPM, the responsible design engineer's signed statement that the final design plans, specifications and calculations conform with all of the requirements set forth in the Energy Commission Decision. If the CBO discovers non-conformance with the stated requirements, the project owner shall correct and resubmit the 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 procedure and results, welder qualifications, certifications, qualified procedure description or number); and
5. Reports covering other structural activities requiring special inspections shall be in accordance with the **2013**~~1998~~ CBC, Chapter 17, Section **1704** ~~1701~~, Special Inspections, Section **1705**~~1701.5~~, **Required Verification and Inspection** ~~Type of Work (requiring special inspection)~~, Section 1702, Structural Observation and Section **1704.5** ~~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 the CBO's approval.

STRUC-3 The project owner shall submit to the CBO design changes to the final plans required by the **2013**~~1998~~ CBC, Chapter 1, Section **107**~~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 abovementioned 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 **2013**~~1998~~ CBC shall, at a minimum, be designed to comply **with H-2** Occupancy Category ~~2~~ of the **2013**~~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**s** listed in the **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 **quality assurance and quality ~~control~~** ~~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 [**2013**~~1998~~ CBC, Section **107**~~106.3.2~~, Submittal Documents, Section 108.3, Inspection Requests, Section **110.3**~~108.4~~, Approval Required; **2013**~~1998~~ California Plumbing Code, Section **103.1.1**~~103.5.4~~, Inspection Request, Section **103.0** ~~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 **107.3.4**~~106.3.4~~, **Design Professional in Responsible Charge** ~~Architect or Engineer of Record~~], which may include, but not be limited to:

- American National Standards Institute (ANSI) B31.1**-2010** (Power Piping Code);
- ANSI B31.2 (Fuel Gas Piping Code);
- ANSI B31.3**-2010** (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.~~ **Codes and ordinances as adopted by the City of El Segundo.**

The CBO may deputize inspectors to carry out the functions of the code enforcement agency [**2013**~~1998~~ CBC, Section **1003**~~3104.2.2~~, 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 [**2013**~~1998~~ CBC, Section **115.4** ~~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 [**2013**~~1998~~ CBC, Section **110.3.8** ~~108.7~~, Other Inspections; Section **107.3.4** ~~106.3.4~~, **Design Professional in Responsible** Charge ~~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 **120** ~~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 **2013** ~~1998~~, Section **107**~~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 [**2013**~~1998~~ CBC, Section **110.3**~~108.4~~, Approval Required, and Section **110.5**~~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 **120/**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 **120/**480 V systems;

~~6. system grounding requirements;~~ and

6~~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 energizing 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

CEC 2005a — CEC (CEC-800-2005-001-CMF). El Segundo Power Redevelopment Project Commission Decision, dated February 2005.

NRG 2013a—NRG/El Segundo Energy Center, L.L.C. (tn 70442). Petition to Amend, dated April, 2013, submitted to the California Energy Commission on April 23, 2013.

• GEOLOGY AND PALEONTOLOGY

Testimony of Casey Weaver, CEG

SUMMARY OF CONCLUSIONS

El Segundo Energy Center, L.L.C. (ESEC LLC), filed a Petition to Amend (PTA) with the California Energy Commission (Energy Commission) requesting to demolish and replace El Segundo Energy Center (ESEC) utility boiler Units 3 and 4 with one new combined-cycle generator (Unit 9), one new steam turbine generator (Unit 10), and two new simple-cycle gas turbines (Units 11 and 12). The PTA also called the El Segundo Power Facility Modification (ESPFM), proposes to eliminate the once-through seawater cooling system and replace that system with dry-cooling technology. (NRG 2013a)

The proposed El Segundo Power Facility Modification (ESPFM) site is located in a geologically active area along the coast of Southern California.

The site is not underlain by an active fault and the site is not subject to surface fault rupture. The site's most proximal known active fault is a segment of the Palos Verdes fault which is located approximately five miles south of the proposed project site. Numerous other active faults are located in both the onshore and offshore vicinity of the project site.

Because of its geologic setting, the site could be subject to very strong levels of earthquake-related ground shaking. The significant effects of strong ground shaking on the ESPFM structures must be mitigated through structural designs required by the most recent edition of the California Building Code (currently CBC 2013). CBC 2013 requires that structures be designed to resist seismic stresses from anticipated maximum ground acceleration.

In addition to strong seismic shaking, the project may be subject to soil failure caused by liquefaction and/or dynamic compaction. A design-level geotechnical investigation required for the project by the CBC 2013, and proposed Geology Condition of Certification **GEO-1** and proposed Facility Design Conditions of Certification **GEN-1**, **GEN-5** and **CIVIL-1** (see the **Facility Design** section of this document), would present standard engineering design requirements for mitigation of strong seismic shaking, liquefaction and potential excessive settlement due to dynamic compaction.

While not likely to occur during the project design life, the site is subject to inundation by tsunami. United States Building codes generally have not addressed the subject of designing structures in tsunami zones (Reynolds 2013). Federal Emergency Management Agency's (FEMA) Coastal Construction Manual (FEMA 55), developed to provide design and construction guidance for structures built in coastal areas, addresses seismic loads for coastal structures and provides information on tsunami and associated loads (CSSC 2005).

Petroleum is the only economic geologic resource in the project vicinity. The project site 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. Other than

petroleum, there are no known viable minerologic or geologic resources at the proposed ESPFM site.

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. Paleontological monitoring was conducted by the project owner during recent construction of the adjacent El Segundo Energy Center (ESEC) Units 5-8. The results of that monitoring were compiled and presented in the Paleontological Resources Report (PRR). The PRR documents the discovery of 251 valuable paleontological resources during construction of ESEC Units 5-8 (JMA 2014). If similar to ESEC Units 5-8, paleontological resources are discovered during construction of the ESPFM Units 9-12, conditions of certification which outline required procedures to mitigate adverse affects to paleontological resources are proposed to be included as part of this project's approval.

Demolition, construction, and operation of the ESPFM would not result in any significant adverse impacts to paleontological, geological or mineralogical resources; would not be subject to immitigable geologic hazards; and would comply with applicable laws, ordinances, regulations, and standards if the measures proposed in the staff's analysis are implemented. The implementation of the current conditions of certification, including proposed modification to Condition of Certification **PAL-7**, and the addition of Condition of Certification **PAL-8** for the ESPFM, will continue to mitigate impacts to below significance for the decommissioning and demolition of Units 3 and 4, and the construction and operation of ESPFM Units 9, 10, 11, and 12. Condition of Certification **PAL-7** was modified to clarify the responsibility of the Paleontological Resource Specialist (PRS) to describe the sensitivity and significance of discovered paleontological resources in the PRR required in **PAL-7**. Proposed Condition of Certification **PAL-8** has been added to assure that the components described in the Paleontological Resources Monitoring and Mitigation Plan (PRMMP), (required in Condition of Certification **PAL-3**) are adequately performed.

While valuable paleontological resources are expected to be discovered during construction of the proposed project, potential impacts to paleontological resources due to construction activities would be mitigated through worker training and monitoring by qualified paleontologists, as required by proposed Conditions of Certification **PAL-1** through **PAL-8**.

INTRODUCTION

In this section, California Energy Commission (Energy Commission) staff discusses the potential impacts of geologic hazards on the proposed ESPFM facility as well as the ESPFM's potential impact on geologic, mineralogic, and paleontologic resources. Staff's objective is to identify resources that could be significantly adversely affected, evaluate the potential of the project construction and operation to significantly impact the resources and provide mitigation measures as necessary to ensure that there would be no significant adverse impacts to geological and paleontological resources during the project construction, operation, and closure and to ensure that operation of the plant

would not expose occupants to high-probability geologic hazards. A brief geological and paleontological overview is provided. The section concludes with staff's proposed conditions of certification that, if implemented, would reduce any project impacts from geologic hazards and impacts to geologic, mineralogic, and paleontologic resources to less than significant levels.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)

Applicable laws, ordinances, regulations and standards (LORS) are listed in the petition to amend (PTA) (NRG 2013a). The following briefly describes the current LORS for both geologic hazards and resources and mineralogic and paleontologic resources.

Geology and Paleontology Table 1
Laws, Ordinances, Regulations, and Standards (LORS)

Applicable Law	Description
Federal	The site is not located on Federal Land and there are no federal regulations directly applicable to the geological or paleontological conditions at the project site
State	
California Building Code (2013)	The California Building Code (CBC 2013) includes a series of standards that are used in project investigation, design, and construction (including seismicity, grading and erosion control). The CBC has adopted provisions in the International Building Code (IBC 2012).
Alquist-Priolo Earthquake Fault Zoning Act, Public Resources Code (PRC), section 2621–2630	Mitigates against surface fault rupture of known active faults beneath occupied structures. Requires disclosure to potential buyers of existing real estate and a 50-foot setback for new occupied buildings.
Seismic Hazards Mapping Act, PRC section 2690–2699	Maps identify areas (zones) that are subject to the effects of strong ground shaking, such as liquefaction, landslides, tsunamis, and seiches. Requires a geotechnical report be prepared that defines and delineates any seismic hazard prior to approval of a project located in a seismic hazard zone.
CEQA, Appendix G Environmental Checklist Form	Asks if project would have impacts on paleontological and mineralogical resources or a unique geological feature.
California Building Code	Requires buildings and other construction to be designed to protect the public from geological hazards.
Local	

Applicable Law	Description
City of El Segundo General Plan	The City of El Segundo addresses public safety and welfare in the City through implementation of its General Plan and compliance with applicable local regulations. General Plan policies specific to geologic, soil, and seismic hazards are listed in the Public Safety Element.
Standards	
Society for Vertebrate Paleontology (SVP), 2010	The "Measures for Assessment and Mitigation of Adverse Impacts to Non-Renewable Paleontological Resources: Standard Procedures" is a set of procedures and standards for assessing and mitigating impacts to vertebrate paleontological resources developed by the SVP, a national organization of professional scientists. The measures were adopted in October 1995, and revised in 2010 following adoption of the Paleontological Resources Preservation Act (PRPA) of 2009.
Bureau of Land Management (BLM) Instructional Memorandum 2008-009	Provides up-to-date methodologies for assessing paleontological sensitivity and management guidelines for paleontological resources on lands managed by the Bureau of Land Management. While not required on non-BLM lands, the methodologies are useful for all paleontological studies, regardless of land ownership.

SETTING

The proposed project is located within the existing coastal-adjacent 33-acre ESEC power plant site. The site is located in Los Angeles County, approximately 2.5 miles southwest of the Los Angeles International Airport, west of Interstate 405, and on the eastern shore of Santa Monica Bay at the southernmost city limit of the city of El Segundo (**GEOLOGY AND PALEONTOLOGY- FIGURE 1**).

The site vicinity is a coastal urban and suburban environment with a variety of commercial, residential, and industrial land uses (**GEOLOGY AND PALEONTOLOGY-FIGURE 2**). A number of parks and schools are scattered throughout the City's residential neighborhoods. The south-western portion of the City is occupied by the Chevron/Texaco Oil Refinery, the city of Los Angeles Scattergood Energy Plant, and the ESEC project. The remainder of the City contains larger parcels with office complexes, industrial uses, and other more intense uses, including high-rise office buildings.

REGIONAL SETTING

Formation of the western coast of North America began in late Triassic during the inception of the Mid-Atlantic rise (DeCourten 2008). Lateral crustal spreading from the mid-Atlantic rise separated the European and African continents from the North American and South American continents. This motion caused the continental North American crustal plate to migrate westward. At this time, the east Pacific rise was also active forming new oceanic crust that was spreading west forming the Pacific plate and east forming the Farallon plate. As the North American plate migrated westward, the eastern edge of the Farallon plate was overridden and subducted beneath the advancing North American plate (Atwater 1998). This crustal subduction continued into the Miocoene (Yeats 2010). As the Farallon plate disappeared into the subduction zone, the East Pacific Rise reached the western edge of the continent and the northern end of the Peninsular Ranges became deformed (Yeats 2010). This deformation caused the Channel Islands-San Nicolas Island crustal block and the Santa Monica Mountains crustal block to move west from the Peninsular Ranges, leaving behind a rift which became the Los Angeles basin (Yeats 2010). The Los Angeles Basin then became filled with late Cenozoic marine sediments which overlie diversely oriented Mesozoic basement rocks.

In early Miocene, plate motion slowly shifted from subduction along the western margin of the North American Continent to transform faulting. As the area was subjected to simple right-lateral shear in late Miocene and early Pliocene time, the pre-existing faults in the Mesozoic basement rocks (formed during the earlier subduction period), propagated upward into the Cenozoic marine sediments as transform fault systems. The orientation of these “new” transform fault systems was controlled by the orientation of the older faults. Localization of shear within these faults caused the older, diversely oriented normal and reverse faults to become inactive as shear stresses reoccupied these pre-existing structures producing the shear (strike–slip) system of today (Yeats 2010).

The Project site is located in the northwestern corner of the Los Angeles Basin in the transition zone between the Transverse Range and the Peninsular Range Structural Provinces of Southern California (**GEOLOGY AND PALEONTOLOGY - FIGURE 3**). Geologically, the Los Angeles Basin and vicinity are divided into four structural blocks related to uplifted zones and synclinal depressions, and are bounded by faults. The project site lies near the northern end of the Southwestern Block, between the Palos Verdes and Newport-Inglewood faults (Norris 1990).

The topography in the area is characterized by a series of northwest trending rounded hills consisting of stabilized sand dunes rising above the main coastal plain. The elevation rises from sea level along the southwestern border of the city of El Segundo to approximately 160 feet above mean sea level in the northern section of the city (El Segundo 2004). Some of the northern area of the city retains the natural dune landscape. In the southern portion of the city, more of the natural topography has been altered. A series of stabilized sand dunes referred to as the El Segundo Sand Dunes and Sand Hills cover the western part of the city. To the west of the city are steep coastal bluffs, exceeding 30 percent slope, descending to a coastal beach area. The

eastern section of the city is flat and at an elevation almost at sea level. The flat surface represents the original erosion terrace of the Torrance Plain on which the coastal sand dunes were deposited (El Segundo 2004).

The Torrance Plain consists of elevated dense silty sand older alluvium, which is covered, locally, with moderately dense silty sand of older eolian deposits. The Torrance Plain is incised and filled with soft, locally derived sandy silt and sandy clay of younger alluvium (CDMG 1998).

The Torrance Plain is underlain by marine and non-marine sediments of the Lakewood Formation. The Lakewood Formation consists of fine to medium grained sandstones, gravelly sandstones and clays which weather into clays and silty clays. The western section of the City is underlain by dune sands in varying stages of consolidation.

PROJECT SITE DESCRIPTION

The project site is located at the southernmost city limit of the city of El Segundo, on the coast of the Pacific Ocean, between Dockweiler State Beach and the city of Manhattan Beach, in Los Angeles County. . It is located less than a 1/4 mile south of the Los Angeles Department of Water & Power's Scattergood Generating Station and 1/2 mile south of the city of Los Angeles' Hyperion Wastewater Treatment Plant. The Chevron El Segundo refinery is located across Vista Del Mar from ESEC. The city of Manhattan Beach is immediately to the south.

The scope of the proposed ESPFM project 2013 Petition to Amend (PTA) is to decommission one existing unit, demolish two existing units, and install equipment to provide 435 megawatts (MW) net / 449 MW gross of more efficient generating units. The equipment proposed for installation includes one NRG fast start combined-cycle generator unit (CC Fast), rated at 222 MW net, incorporating a General Electric natural gas combustion turbine generator designed to achieve 75 percent of base load output in 10 minutes, one two-pressure, duct-fired heat recovery steam generator (HRSG) designed for rapid startup with conventional selective catalytic reduction system (SCR)/carbon monoxide (CO) catalysts, one single-case, non-reheat axial exhaust admission condensing steam turbine generator (STG) rated at 112 MW and designed for non-traditional elevated condensing pressure to minimize cooling system size, one Heller dry cooling tower system, two Rolls Royce Trent 60 generators, rated at 55 MW/unit net, consisting of advanced aeroderivative simple-cycle gas turbines, and one Cleaver Brooks auxiliary boiler consisting of a direct contact spray condenser and a mechanically-induced-draft dry-cooling tower.

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.

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. 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 cut slope approximately 70 feet high makes up the eastern border of the site. This slope is heavily vegetated and is cut into semi-consolidated dune sand. 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 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 5 through 8. North of Units 5 through 8, the slope gradually steepens.

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

This section assesses two types of impacts. The first is the potential impacts the proposed facility could have on existing geologic, mineralogic, and paleontologic resources in the area. The second is the potential geologic hazards, which could adversely affect the proper functioning of the proposed facility and create life/safety concerns.

METHOD AND THRESHOLD FOR DETERMINING SIGNIFICANCE

The California Environmental Quality Act (CEQA) guidelines, Appendix G, provide a checklist of questions that lead agencies typically address when assessing impacts related to geologic and mineralogic resources, and effects of geologic hazards.

- Section (V) (c) includes guidelines that determine if a project will either directly or indirectly destroy a unique paleontological resource or site, or a unique geological feature.
- Sections (VI) (a), (b), (c), (d), and (e) focus on whether or not the project would expose persons or structures to geologic hazards.
- Sections (XI) (a) and (b) concern the project's effects on mineral resources.

To assess potential impacts on unique geologic features and effects on mineral resources, staff has reviewed geologic and mineral resource maps for the surrounding area, as well as site-specific information provided by the petitioner, to determine if geologic and mineralogic resources exist in the area.

To assess potential impacts on paleontological resources, staff reviewed the paleontological resources technical report and section 5.8 of the Application for Certification (AFC) (EPSR 2000). No significant paleontological resources were reported by the applicant's paleontologist during the paleontological archive and literature reviews. The project site is highly disturbed and partially covered by artificial fill. No paleontological resources were observed by Energy Commission staff at the project site during site visits on March 13 and May 2, 2001. In compliance with the

conditions of certification for the construction of ESEC Units 5 through 8 between 2011 and 2013, paleontological monitoring was conducted on the site and along project linears. The PRR has recently been finalized documenting the discovery of valuable fossils in the adjacent facility.

If, similar to ESEC Units 5-8, paleontological resources are discovered during construction of ESPFM Units 9-12, conditions of certification which outline required procedures to mitigate adverse affects to paleontological resources are proposed to be included as part of this project's approval.

The California Building Standards Code (CBSC) and CBC 2013 provide geotechnical and geological investigation and design guidelines, which engineers must follow when designing a facility. As a result, the criterion used to assess the significance of a geologic hazard includes evaluating each hazard's potential impact on the design, construction, and operation of the proposed facility. Geologic hazards include faulting and seismicity, liquefaction, dynamic compaction, hydrocompaction, subsidence, expansive soils, landslides, tsunamis, seiches, and others as may be dictated by site-specific conditions.

DIRECT/INDIRECT IMPACTS AND MITIGATION

An assessment of the potential impacts to geologic, mineralogic, and paleontologic resources, and from geologic hazards is provided below. The assessment of impacts is followed by a summary of potential impacts that may occur during construction and operation of the project and provides recommended conditions of certification that would ensure potential impacts are mitigated to a level that is less than significant. The recommended conditions of certification would allow the Energy Commission's compliance project manager (CPM) and the petitioner to adopt a compliance monitoring scheme ensuring ongoing compliance with LORS applicable to geologic hazards and the protection of geologic, mineralogic, and paleontologic resources.

GEOLOGIC AND MINERALOGIC RESOURCES

The project is located adjacent to the El Segundo Oil Field (**GEOLOGY AND PALEONTOLOGY - FIGURE 4)**. A single producing oil well owned by Occidental Petroleum is located approximately one-half mile north of the site. The project location is designated as Mineral Resources Zone-3, an area of undetermined mineral resources potential (CDMG 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. At the ESEC site, the geologic units at the surface and in the subsurface are widespread alluvial deposits that occur throughout the El Segundo area (**GEOLOGY AND PALEONTOLOGY - FIGURE 5)**. These geologic units are not unique in terms of recreational, commercial, or scientific value.

Based on the information above, it is staff's opinion that the project would have no effect on oil and gas production or on other geologic resources of commercial value or on the availability of such resources and would not have any significant adverse direct or indirect impacts to potential geologic and mineralogic resources.

PALEONTOLOGIC RESOURCES

Geotechnical investigations conducted on site indicate the site is mantled by a layer of engineered fill approximately 2 feet thick underlain by Holocene-age alluvial and dune deposits consisting of silty sand and sand (Ninyo 2006). The Holocene deposits consist of alternating layers of medium dense to very dense sand, clayey sand, silty sand, gravelly sand and sandy silt and firm to hard, clayey silt and silty clay to the maximum depth explored being 28 feet (Ninyo 2006). Underlying the Holocene deposits are sediments of the Pleistocene Palos Verdes Formation. The Palos Verdes Formation consists of greenish-gray, fine- to medium-grained sand with traces of silt and clay. Within the Palos Verdes Formation is a unit referred to as the Palos Verdes Sand. The Palos Verdes Sand is a fossiliferous layer of marine gray sands and gravels (BonTerra 2010). This unit was deposited between 95,000 and 130,000 years before present and has produced a large number of fish fossils, as well as the remains of terrestrial and aquatic birds and mammals (BonTerra 2010). Although primarily known for its fossil mollusks, the Palos Verdes Sand has yielded remains of sharks, bony fish, birds, and marine mammals (BonTerra 2010). In addition to the marine fossils, a number of large, extinct, Ice Age land mammals such as mammoth, mastodon, bison, horse, and camel have been found (BonTerra 2010). The Palos Verdes Sand represents a time when coastal waters off Southern California were several degrees warmer than today (BonTerra 2010).

Beneath the Palos Verdes Formation lies the San Pedro Formation. The San Pedro Formation represents the oldest known Cenozoic sedimentary unit of Pleistocene age in the Los Angeles Coastal Region. This formation was described for outcrops in the vicinity of nearby San Pedro Harbor and then applied to extensive beds of unconsolidated sand containing abundant mollusk shells of Pleistocene age, outcropping as far south as San Diego and as far north as Santa Monica. The fossiliferous sand unit within the San Pedro Formation is referred to as the San Pedro Sand (BonTerra 2010). The San Pedro Sand consists of gray to dark gray to reddish-yellow stained siltstone and clayey siltstone with friable, interbedded fine to gravelly coarse grained sandstones. Based on sedimentary structures and variable lithologies, this rock unit represents a wide range of depositional environments. These environments range from nearshore, shallow marine to lagoonal, to back-bay tidal flat (BonTerra 2010).

In the San Pedro area, the San Pedro Sand has yielded crustaceans, marine mollusks (clams and snails), bony fish and sharks, amphibians, and birds (BonTerra 2010). Large late Pleistocene extinct mammals found there include *Bison*, *Mammuthus* (mammoth), *Paramylodon* (sloth), *Equus* (horse), and *Capromeryx* (very small antelope). In addition to the large extinct mammals, extant pond turtle, rabbits, rodents, and marine mammals also occur. Recent amino acid dating of marine mollusks from the San Pedro Sand in the Palos Verdes Hills has yielded dates of 330,000 years before present (Ponti 1989).

Beneath the Pleistocene San Pedro Sand is the Pliocene Pico Formation. The Pico Formation is composed of marine sands, silts, and clays, and extends nearly a thousand feet below the base of the San Pedro Sand (BonTerra 2010). The uppermost portion of this unit is composed of silts and clays, with local lenses of gravel, while the

lowermost portion of this unit is composed of sands and gravels. This unit, and those underlying it, was not analyzed in detail, because they lie well below the depth of any anticipated construction activity.

The La Brea Tar Pit fossil mammal assemblage of upper Pleistocene age is derived from the Palos Verdes Sand. This assemblage includes a wide variety of carnivores (dogs and cats), small to large ungulate herbivores (deer, antelope, camel, horse, pig), sloth, and a myriad of small mammals including rabbits, rodents, insectivores and a variety of birds and lower vertebrates (frogs, lizards and snakes).

Many of the fossil specimens represent the best preserved specimens of particular taxa found to date. Mammalian assemblages collected from both the San Pedro Sands and Palos Verdes Sands in the vicinity of the project area contain fossil remains of most of the Rancho La Brea terrestrial vertebrate groups. Also included at some of these sites are aquatic mammalian taxa including otter, whale, and dolphin as well as shark and teleost fish taxa, and birds.

Numerous paleontological sites occur within a five-mile radius of the ESEC site. A fossil proboscidian (elephant family) bone was found in the middle of the Los Angeles International Airport. At other sites a baby mammoth jaw, horse, mammoth, bison, rabbit, rodent, and fish material was recovered.

During the geotechnical investigation for ESEC Units 5, 6, 7 and 8, shell fragments were found in drill cuttings returned to the surface from depths between 5 and 22 feet below ground surface (Ninyo 2010). These depths generally coincided with the top of the Older Alluvium unit beneath the fill and dune sands. During construction of ESEC Units 5, 6, 7 and 8, all excavations were monitored in accordance with Conditions of Certification **PAL-1** through **PAL-7**. The PRR was recently completed and it documents the results of the paleontological monitoring conducted on the site (JMA 2014). The PRR indicates that a total of 251whole and partial fossil specimens representing 25 genera were collected during the monitoring program. The collected fossils are considered by the PRS to be “valuable paleontological resources” (JMA 2014).

Even though the site is developed and paved and mantled with artificial fill, excavations are proposed for project construction. If the excavations extend through the fill, native soils may be encountered. Based on the discoveries during monitoring of the area adjacent to the project site (JMA 2014), there is a high potential for valuable fossils to be encountered in the excavations. Therefore, staff considers monitoring of construction activities in accordance with the existing and proposed conditions of certification is necessary.

In this analysis, existing Condition of Certification **PAL-7** has been modified with proposed language that clarifies the responsibility of the PRS to describe the sensitivity and significance of discovered paleontological resources in the PRR required in **PAL-7**. Proposed Condition of Certification **PAL-8** has been added to assure that the components described in the PRMMP, (required in Condition of Certification **PAL-3**) is adequately performed.

Proposed Conditions of Certification **PAL-1** to **PAL-8** are designed to mitigate any potential paleontological resource impacts, as discussed above, to a less than significant level. Essentially, these conditions would require a worker education program in conjunction with monitoring of proposed earthwork activities by qualified professional paleontologists (paleontologic resource specialist; PRS).

Earthwork would be halted in the immediate area of the find at any time potential fossils are recognized by either the paleontological monitor or the worker. When properly implemented, the conditions of certification would yield a net gain to the science of paleontology since fossils that would not otherwise have been discovered can be collected, identified, studied, and properly curated. A PRS would be retained for the proposed project by the project owner to produce a monitoring and mitigation plan, conduct the worker training, and provide the on-site monitoring. During the monitoring, the PRS can petition the CPM for a change in the monitoring protocol. Most commonly, this would be a request for lesser monitoring after sufficient monitoring has been performed to ascertain that there is little chance of finding significant fossils. In other cases, the PRS can propose increased monitoring due to unexpected fossil discoveries or in response to repeated out-of-compliance incidents by the earthwork contractor.

GEOLOGICAL HAZARDS

The AFC and the Final Engineering Geology Report (Ninyo 2013) provides documentation of potential geologic hazards at the proposed ESPFM site. Staff reviewed information presented in the engineering geology report and conducted independent research regarding the site's susceptibility to geologic hazards. Staff believes that the possibility of geologic hazards affecting plant operations, during its practical design life (40 years), would be low because the owner would further evaluate site conditions and design structures to mitigate potential impacts. The potential and probability for the site to be affected by geologic hazards such as strong seismic shaking, liquefaction and dynamic compaction, would need to be addressed in a project geotechnical report per CBC 2013 requirements. Recommendations from the geotechnical report should be incorporated in the project design.

Staff's independent research included the review of available geologic maps, reports, and related data of the proposed ESPFM site. Geological information from the California Geological Survey (CGS), California Division of Mines and Geology (CDMG), and other governmental organizations was reviewed. Staff's analysis of this information is provided below.

Faulting and Seismicity

In southern California, tectonic deformation between the Pacific and North American plates is accommodated primarily by a zone of transform strike slip faults oriented with a predominant northwest trend; however, within this complex zone of shear, areas of tectonic compression also occurs which has formed numerous folds (anticlines and synclines), reverse faults and blind thrust faults.

Major active and potentially faults in the region are shown on **GEOLOGY AND PALEONTOLOGY - FIGURE 6**. Most of the tectonic deformation in southern California

occurs along strike slip faults associated with the on land portion of the San Andreas fault system. In addition to the on land faults, the tectonic shear is shared with faults in the offshore inner Continental Borderland region (Grant 2004).

In 2002, Grant and Rockwell postulated that an active 300-km-long Coastal Fault zone extends between the Los Angeles basin and coastal Baja California (Grant 2002). This Coastal Fault zone includes those faults contained within the inner Continental Borderland which become contiguous with the Agua Blanca fault in Baja California (Grant 2004). The Agua Blanca fault is considered to have a slip rate between 5 and 7 millimeters/year (Rockwell 2012). That slip is believed to be transferred to the offshore faults within the inner Continental Borderland (Rockwell 2012). The geometry and slip rate of faults in the inner Continental Borderland are poorly constrained relative to onshore faults, yet they may pose significant seismic risk because they are close to populated areas, and several offshore faults appear to displace seafloor sediments (Legg 1991).

Active faults in southern California associated with shear between the north American and Pacific plates include (from east to west), the San Andreas fault zone, the San Jacinto fault zone, the Elsinore fault zone, the Whittier fault zone, the Newport-Inglewood fault zone, the Palos Verdes fault zone, the San Diego Trough fault zone and the San Clemente fault zone. Faults specific to the inner Continental Borderland include the Newport-Inglewood fault zone, the Palos Verdes fault zone, the San Diego Trough fault zone and the San Clemente fault zone (Legg 2002).

In addition to the strike slip faults discussed above, compressive forces have formed folds (anticlines and synclines), reverse faults and blind thrust faults (Blind thrusts). Blind thrusts underlie regions undergoing contraction in the Los Angeles Basin and are expressed at the surface only as active folds. The Compton-Los Alamitos fault and the San Joaquin Blind thrust are examples of this style of deformation. Seismic hazards posed by active thrusts are assessed in the Los Angeles Basin by a number of means, all of which are aimed at placing constraints on fault slip rates, earthquake recurrence and fault geometry and segmentation (Mueller 2005). Research into the relationship between fault slip, fault geometry and fold growth thus provides insight into the occurrence of earthquakes produced on these structures. Large earthquakes originating on blind thrusts within Southern California have occurred in the past century, illuminating their geometry and potential for seismic hazard and include the Moment magnitude (Mw) 5.9 1987 Whittier Narrows earthquake and the Mw 6.8 1994 Northridge earthquake. It is likely that in 1769, a Magnitude 7+ earthquake occurred on the San Joaquin Blind thrust which uplifted coastal Orange County approximately 10 feet (Grant 2004).

An In depth study of the active faults in the Los Angeles Basin Metropolitan Region was completed by the Southern California Earthquake Center in 2001 (SCEC 2001). Active faults with a potential to affect the ESEC site are listed and described below and their locations presented on **GEOLOGY AND PALEONTOLOGY - FIGURE 6**.

San Andreas Fault Zone

The San Andreas is the "master" fault of an intricate fault system that defines the boundary between the Pacific and North American crustal plates in California (Schulz 1992). The entire San Andreas fault system is more than 800 miles long and extends to depths of at least 10 miles within the Earth. In detail, the fault is a complex zone of crushed and broken rock from a few hundred feet to a mile wide. Many smaller faults branch from and join the San Andreas fault zone.

Over much of its length, a linear trough reveals the presence of the San Andreas fault; from the air, the linear arrangement of lakes, bays, and valleys in this trough is striking. Viewed from the ground, however, the features are more subtle. For example, many people driving near Crystal Springs Reservoir, near San Francisco, or along Tomales Bay, or through Cajon or Tejon Passes may not realize that they are within the San Andreas fault zone. On the ground, the fault can be recognized by carefully inspecting the landscape. The fault zone is marked by distinctive landforms that include long straight escarpments, narrow ridges, and small undrained ponds formed by the settling of small blocks within the zone. Many stream channels characteristically jog sharply to the right where they cross the fault.

At least 350 miles of offset has occurred along the San Andreas fault since it came into being about 15-20 million years ago (Schulz 1992). Surveying demonstrates the strain (displacement) occurs along the fault at the rate of approximately 2 inches per year.

San Jacinto Fault Zone

The San Jacinto fault zone is one of the major branches of the San Andreas fault system in southern California (Sharp 1965).

The San Jacinto fault zone is a complex zone of splaying and overlapping strike-slip fault segments, steps and bends, and associated zones of contractional and extensional deformation (Dorsey 2002). Offsets on basement piercing points and Pleistocene strata indicate that about 25 km of slip has accumulated on the San Jacinto fault during the past 1.5 to 2.0 Ma (Dorsey 2002). Based on GPS studies and offsets of dated Quaternary deposits, the rate of slip on the San Jacinto system is generally agreed to be ~10-12 mm/yr. This represents 20-25 percent of the present-day Pacific-North American relative plate motion (Dorsey 2002).

The straightness, continuity, and high seismicity of the San Jacinto fault zone suggest that it may be currently the most important member of the San Andreas fault system in southern California (Sharp 1965).

Elsinore Fault Zone

The Elsinore fault zone parallels the San Jacinto and is part of the same right-lateral crustal plate strain system as the San Andreas and the San Jacinto (ECI 2000).The Elsinore branches into the Whittier fault near Santa Ana Canyon, where it borders the Puente Hills to the southwest and the Chino fault to the northeast. The most apparent displacements on the Whittier-Elsinore have been vertical, as evidenced by the steep scarp (an earthquake-built cliff) along the Santa Ana Mountains.

Whittier Fault Zone

The Whittier fault zone is exposed for a distance of about 25 miles along the south slopes of the Puente Hills from the Whittier Narrows on the northwest to the Santa Ana River near its southwest end (Yerkes 1965). In the vicinity of the Santa Ana River, it joins with the northern end of the Elsinore Fault Zone. Recent deformation along the Whittier Fault Zone is indicated by steeply tilted and locally overturned strata of late Pleistocene age (Yerkes 1965). Trenching along the fault has uncovered evidence of recent offsets, including faulted Holocene alluvium dated at 1400 to 2200 years before present (Gath 1988).

Transverse Ranges Southern Boundary Fault System

Transverse Ranges Southern Boundary fault system is a west-trending system of reverse, oblique-slip, and strike-slip faults that extends for more than 200 km along the southern edge of the Transverse Ranges (Dolan 1997, Dolan 2000a). The Transverse Ranges Southern Boundary Fault System in the Los Angeles Region as discussed below includes the Santa Monica Fault, The Hollywood fault and the Raymond fault. To the west of the Los Angeles region, The Anacapa-Dume, Malibu Coast, Santa Cruz Island, and Santa Rosa Island faults are also part of this system, but are not included in this analysis.

Santa Monica fault

The Santa Monica fault extends east from the coastline in Pacific Palisades through Santa Monica and West Los Angeles and merges with the Hollywood fault at the West Beverly Hills Lineament in Beverly Hills, west of the crossing of Santa Monica Boulevard and Wilshire Boulevard, where its strike is northeast (SCEC 2001).

Onshore, the fault offsets the ground surface 2-3.5 km south of the Santa Monica Mountains range front (Dolan 2000a). Accordingly, the fault traverses alluvium that allows the Quaternary history of the fault to be characterized based on geomorphology, stratigraphy, and seismic reflection characteristics (Dolan 1997; Dolan 2000a).

The Southern California Earthquake Data Center states the type of faulting is left-reverse, extends a length of 24 km and has a probable magnitude between 6.0 and 7.0 (SCEDC 2013).

According to Dolan and Pratt (Dolan 1997), uplift of an alluvial-fan surface north of the fault requires a reverse-slip rate of ~0.5 mm/yr.

Hollywood fault

The Hollywood fault extends East-Northeast from the end of the Santa Monica Fault for a distance of 14 km through Beverly Hills, West Hollywood, and Hollywood to the Los Angeles River and Interstate 5. The Hollywood fault is separated from the Santa Monica Fault where the fault makes a left step of 1.2 km, possibly attributed to offset by the northwest continuation of the Newport-Inglewood fault.

In Hollywood, where the fault was studied in detail by James Dolan (Dolan 1997; Dolan 2000b), the active fault is close to the Santa Monica Mountains range front. Farther

west, however, near the intersection of Sunset and La Cienega boulevards in West Hollywood, the active fault lies near the base of a pronounced south-facing alluvial apron along the mountain front (Dolan 1997; Lindvall 2001).

Based on a number of independent geological investigations and recent work by the California Geological Survey (CGS), which lead to the publication of 2010 Fault Activity Map of California (CGS 2010a), CGS has commenced a detailed study of the Hollywood Fault and its associated splay faults for possible zoning as “Active” pursuant to the Alquist-Priolo Act (CGS 2007a). In January 2014, CGS released an updated preliminary review map of earthquake fault zones in the Hollywood Quadrangle. After a public comment period and review of geological studies which are currently underway, a final version of the map is scheduled to be released in early July 2014 (CGS 2014) .

While the report in preparation will update existing information, the Southern California Earthquake Data Center states the type of faulting of the Hollywood fault is left-reverse, extends a length of 15 km and has a probable magnitude between 5.8 and 6.5 with a slip rate between 0.33 and 0.75 mm/yr. (SCEDC 2013).

Raymond fault

A sharp gravity gradient connects the western end of the Raymond fault across the Los Angeles River floodplain with the eastern end of the Hollywood fault, but this connection is not confirmed by geological evidence except for local air-photo lineations. The Raymond fault extends 25 km from the Los Angeles River east of Griffith Park east to east-northeast across the San Gabriel Valley through South Pasadena, Pasadena, San Marino, Arcadia, and Monrovia to a junction with the Sierra Madre fault at the foot of the San Gabriel Mountains. The fault is defined by aligned left-deflected drainages, shutter ridges, sagponds, and pressure ridges in right-stepping restraining bends which indicate that the Raymond fault is predominantly a left-slip fault (SCEC 2001). The 1988 Pasadena earthquake of ML 4.9 probably occurred on the Raymond fault based on the fault-plane solution of the mainshock and the distribution of aftershocks (Jones 1990). Interpretation of aftershock epicenters indicate that the plane of the fault dips 80° north.

The Southern California Earthquake Data Center states the type of faulting of the Raymond fault is left-lateral strike slip with only minor reverse component, extends a length of 25 km and has a probable magnitude between 6.0 and 7.0 with a slip rate between 0.10 and 0.22 mm/yr. (SCEDC 2013).

Compton-Los Alamitos Fault Zone

The Compton blind thrust fault is active and has generated at least six large-magnitude earthquakes (M_w 7.0–7.4) during the past 14,000 years (Leon 2009). Deformed Holocene strata record recent activity on the Compton thrust and are marked by discrete sequences that thicken repeatedly across a series of buried fold scarps. Minimum uplift in each of the scarp-forming events, which occurred at 0.7–1.75 thousand years ago (ka) (event 1), 0.7–3.4 ka or 1.9–3.4 ka (event 2), 5.6–7.2 ka (event 3), 5.4–8.4 ka (event 4), 10.3–12.5 ka (event 5), and 10.3–13.7 ka (event 6), ranged from ~0.6 to ~1.9 m,, indicating minimum thrust displacements of ≥1.3 to 4.2 m. Such large displacements are consistent with the occurrence of large-magnitude earthquakes

($M_w \geq 7$). This large, concealed fault underlies the Los Angeles metropolitan area and thus poses one of the largest deterministic seismic risks in the United States (Leon 2009).

San Joaquin Hills Blind Thrust

The late Quaternary uplift rate of the San Joaquin Hills is approximately twice as high as uplift rates parallel to the Newport-Inglewood Fault Zone (NIFZ) along the coast to the south (Grant 2002). Several observations suggest that the San Joaquin Hills are underlain by a fault that is distinct from the NIFZ, although they may be linked kinematically. There are several Quaternary anticlines along the NIFZ north of the San Joaquin Hills (Grant 2002). However, the San Joaquin Hills anticline is longer and has the greatest topographic expression. Other topographically prominent anticlines, such as Signal Hill, are located within the structurally complex NIFZ and are associated with step-overs (Barrows 1974).

Geomorphic studies along the coastline in the vicinity of the San Joaquin Hills have discovered emergent shorelines along the open coast and an elevated marsh bench in Newport Back Bay. The surface of the marsh bench is approximately 5 feet above the current marsh elevation (Grant 2002). Radiocarbon dating and interpretation of the introduction of exotic pollens contained within the elevated marsh bench indicates that the marsh bench was uplifted between the years 1635 and 1797 (Grant 2002).

On July 28, 1769, a strong temblor was described by explorer Gaspar de Portola while he was in the central Los Angeles basin area (Townley 1939). The mainshock was described as violent, and at least two dozen earthquakes followed it over the course of several days. It is likely that the 1769 San Joaquin Hills earthquake occurred on the San Joaquin Blind Thrust and was responsible for the uplift of the elevated marsh bench in Newport Bay and the emergent shorelines along the open coastline (Grant 2002). The San Joaquin earthquake may be the largest known earthquake that has originated within the greater Los Angeles region in the last few centuries (Grant 2002).

Newport-Inglewood Fault Zone

The Newport-Inglewood fault zone (NIFZ) is approximately 1.5-2.5 km wide, trends N45-60W, is mainly a right-lateral tectonic structure that extends from the Santa Monica Mountains on the north to offshore connection with the Rose Canyon fault at San Diego on the south (Shlemon 2008). Known active fault traces in the NIFZ zone of deformation have been mapped in Alquist-Priolo Special Studies Zones (CDMG 1997).

The Newport–Inglewood fault zone (NIFZ) was first identified as a significant threat to southern California residents in 1933 when it generated the M 6.3 Long Beach earthquake, killing 115 people and providing motivation for passage of the first seismic safety legislation in the United States (Grant 2004).

Ongoing studies indicate the NIFZ is capable of generating earthquakes with magnitudes up to 7.4 Mw (Toppozada 1989) or 7.5 Mw (Petersen 2008). The higher magnitude indicated by Petersen uses a fault length of 208 km as described by Shlemon (2008). At its closest approach, the active trace of the NIFZ lies approximately 6 miles northeast of the project site (**GEOLOGY AND PALEONTOLOGY - FIGURE 6)**.

Palos Verdes Fault Zone

The Palos Verdes Fault Zone extends southwestward from the northern part of Santa Monica Bay to the area southwest of Lasuen Knoll, offshore from Dana Point (Fisher 2004).The structure of the Palos Verdes Fault Zone changes markedly southeastward across the San Pedro Shelf and slope. Under the northern part of the shelf, this fault zone includes several strands, but the main strand dips west and is probably an oblique-slip fault (Fisher 2004). Under the slope, this fault zone consists of several fault strands having normal separation, most of which dip moderately east. To the southeast near Lasuen Knoll, the Palos Verdes Fault Zone locally is a low angle fault that dips east, but elsewhere near this knoll the fault appears to dip steeply. Fresh sea-floor scarps near Lasuen Knoll indicate recent fault movement (Fisher 2004).

Analysis of wave-cut terraces and offset stream courses indicates total fault-slip rate to be around 3 mm/yr. (Fisher 2004). The main style of movement along the Palos Verdes Fault Zone has been strike slip and multibeam bathymetric data show recent scarps along this fault near Lasuen Knoll indicating the fault's recent activity. At its closest approach, the trace of the Palos Verdes Fault Zone lies approximately 5 miles south of the project site (**GEOLOGY AND PALEONTOLOGY - FIGURE 6)**.

San Diego Trough Fault Zone

The San Diego Trough Fault Zone runs roughly from the Mexican border northward toward Catalina Island. The San Diego trough fault zone (SDTFZ) is part of a 90-km-wide zone of faults within the inner Continental Borderland that accommodates motion between the Pacific and North American plates (Ryan 2012). New seismic reflection data shows that the fault zone steps across a 5-km-wide stepover and continues for an additional 60 km north of its previously mapped extent. At the latitude of Santa Catalina Island, the SDTFZ bends 20° to the west and may be linked via a complex zone of folds with the Palos Verdes fault zone (PVFZ). If this is the case, this fault zone would be one of the longest in the California Borderland, and could produce some of the largest earthquakes in the region (Poppick 2013). The 1986 epicenter of the Oceanside earthquake (a magnitude 5.4 quake that caused nearly one million dollars in damage, 29 injuries, and one death) and the associated 1986 earthquake swarm is located within the SDTFZ (Poppick 2013). In a cooperative program between the U.S. Geological Survey (USGS) and the Monterey Bay Aquarium Research Institute (MBARI), the coseismic offset of a submarine channel that intersects the fault zone near the SDTFZ– PVFV junction was measured and dated. This research indicated an estimated horizontal slip rate of about 1.5±0.3 mm/yr over the past 12,270 yr (Ryan 2012).

San Clemente Fault Zone

The San Clemente fault zone is the westernmost of the group of right lateral faults traversing the California Inner Continental Borderland (Legg 1989). The main trace of the San Clemente fault cuts a straight path directly across the rugged topography of the region, displaying evidence of a steeply dipping (near vertical) fault surface. Modern tectonic activity along the San Clemente fault zone is demonstrated by numerous earthquakes with epicenters located along the fault's trend. The average strike of the San Clemente fault is parallel to the Pacific-North American relative plate motion vector

at this location and is a part of the broad Pacific-North American transform plate boundary (Legg 1989).

Fault Rupture

All of the faults discussed above have the potential to generate strong seismic shaking at the project site. However, none have the potential to cause fault offset of the ground surface at the project site.

The Alquist-Priolo Earthquake Fault Zoning Act of 1994 (formerly known as the Alquist-Priolo Special Studies Zone Act of 1972) stipulates that no structure for human occupancy may be built within an Earthquake Fault Zone until geologic investigations demonstrate that the site is free of fault traces that are likely to rupture with surface displacement (CGS 2007a). Earthquake Fault Zones include faults considered to have been active during Holocene time and to have a relatively high potential for surface rupture (CGS 2008). An Earthquake Fault Zone has not been mapped on the project site.

Fault rupture almost always follows pre-existing faults, which are zones of weakness (CGS 2007). No active faults are shown on published maps as crossing the boundary of new construction on the proposed ESEC power plant site or associated linear facilities. Therefore, it is highly unlikely that the site would experience surface fault rupture during the project's design life.

Seismic Shaking

Preliminary estimates of ground motion based on probabilistic seismic hazard analyses have been calculated for the project site using the USGS Earthquake Hazards application called the U.S. Seismic "Design Maps" Web Application (**Geology and Paleontology Table 2**). This application produces seismic hazard curves, uniform hazard response spectra, and seismic design values. The values provided by this application are based upon data from the 2008 USGS National Seismic Hazard Mapping Project. These design parameters are for use with the 2012 International Building Code, the 2010 ASCE-7 Standard, the 2009 NEHRP Provisions, and their respective predecessors.

These parameters are project-specific and, based on ESEC's location, were calculated using latitude and longitude inputs of 33.910 degrees north and 118.425 degrees west, respectively. Other inputs for this application are the site "type" which is based on the underlying geologic materials and the "Structure Risk Category". The assumed site class for ESEC is "E", which is applicable to soft clay soil. These parameters can be updated as appropriate following the results presented in a project-specific geotechnical investigation report performed for the site. The assumed "Structure Risk Category" is "III", which is based on its inherent risk to people and the need for the structure to function following a damaging event. Risk categories range from I (non essential) to IV (critical). Examples of risk category I include agriculture facilities, minor storage facilities, etc., while examples of category IV include fire stations, hospitals, nuclear power facilities, etc

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Geology and Paleontology Table 2
Planning Level 2010 CBC Seismic Design Parameters Maximum Considered Earthquake, ASCE 7 Standard

Parameter	Value
Assumed Site Class	E
Structure Risk Category	III - Substantial
SS – Mapped Spectral Acceleration, Short (0.2 Second) Period	1.642 g
S1 – Mapped Spectral Acceleration, Long (1.0 Second) Period	0.616 g
Fa – Site Coefficient, Short (0.2 Second) Period	0.900
Fv – Site Coefficient, Long (1.0 Second) Period	2.400
SDS – Design Spectral Response Acceleration, Short (0.2 Second) Period	0.985 g
SD1 – Design Spectral Response Acceleration, Long (1.0 Second) Period	0.986 g
SMS – Spectral Response Acceleration, Short (0.2 Second) Period	1.478 g
SM1 – Spectral Response Acceleration, Long (1.0 Second) Period	1.479 g

ASCE = American Society of Civil Engineers
Values from USGS 2010b

The ground acceleration values presented are typical for the area. Other developments in the adjacent area will also be designed to accommodate strong seismic shaking. The potential for and mitigation of the effects of strong seismic shaking during an earthquake should be addressed in a project-specific geotechnical report, per CBC 2013 requirements, and proposed Condition of Certification **GEO-1** and Facility Design Conditions of Certification **GEN-1**, **GEN-5** and **CIVIL-1** (see **Facility Design** section within this document). Compliance with these conditions of certification would ensure the project is built to current seismic standards and potential impacts would be mitigated to insignificant levels in accordance with current standards of engineering practice.

Liquefaction

Liquefaction is the phenomenon in which uniformly sized, loosely deposited, saturated, granular soils with low clay contents undergo rapid loss of shear strength through the development of excess pore pressure during strong earthquake induced groundshaking of sufficient duration to cause the soil to behave as a fluid for a short period of time. Liquefaction generally occurs in saturated or near-saturated cohesionless soils at depths shallower than 50 feet below the ground surface. If the liquefying layer is near the surface, the effect for any structure supported on it is much like that of quicksand, resulting in sinking or tilting. If the layer is deeper in the subsurface, it can provide a sliding surface for materials above it, resulting in lateral motion (spreading or lurching) toward any nearby ‘free face’ (shore bluff, river embankment, excavation wall (PBS&J 2009).

The proposed project site is mapped adjacent to a Liquefaction Investigation Zone on the State of California Seismic Hazard Zone Map for the Venice Quadrangles (CGS 1999). A Liquefaction Investigation Zone is an area “where historic occurrence of liquefaction, or local geological, geotechnical and groundwater conditions indicate a potential for permanent ground displacement such that mitigation as defined in Public

Resources Codes Section 2693(c) [Seismic Hazards Mapping Act] would be required" (CGS 1999).

Groundwater was encountered during construction of ESEC Units 5 through 8 at depths between 7 and 11 feet below ground surface (Ninyo 2013). The presence of shallow groundwater raises concerns about liquefaction potential, settlement rates, and the possible need for construction dewatering.

Based on site observations and review of information presented in the final engineering geology report (Ninyo 2013), subsurface conditions at the site are likely to be conducive to liquefaction. Groundwater levels should be confirmed and the liquefaction potential on the proposed ESEC site should be addressed in a project-specific geotechnical report, per CBC 2013 requirements and proposed Condition of Certification **GEO-1**, and Facility Design Conditions of Certification **GEN-1**, **GEN-5** and **CIVIL-1** (see **Facility Design** section within this document).

Lateral Spreading

Lateral spreading of the ground surface during an earthquake usually takes place along weak shear zones that have formed within a liquefiable soil layer. Lateral spreading generally takes place in the direction of a free-face (i.e., retaining wall, slope, and/or channel).

An empirical model is typically used to predict the amount of horizontal ground displacement within a site (Ninyo 2013). For sites located in proximity to a free-face, the amount of lateral ground displacement is strongly correlated with the distance of the site from the free-face.

The project site lies at an elevation of approximately 19 to 20 feet above mean sea level. Grading for the construction of the initial ESGS facility created a free-face cut slope approximately 70 feet high cut into older Dune Sand deposits along the eastern border of the site. In the preliminary geotechnical report, groundwater in this area was determined to be at an elevation near sea level. Therefore, the soils in the area of the free face are not saturated and the likelihood of lateral spreading due to liquefaction affecting the free-face on the eastern portion of this site is considered remote.

Other factors such as earthquake magnitude, distance from the earthquake epicenter, thickness of the liquefiable layers, and the fines content and particle sizes of liquefiable layers also affect the amount of lateral ground displacement. Based on the relative density of the potentially liquefiable soil layers, Ninyo and Moore concluded in their Final Engineering Geology Report that "the project site is not considered susceptible to significant seismically induced lateral spread" (Ninyo 2013). However, the susceptibility of the underlying beds to lateral spread beneath the proposed ESEC site should be addressed in a project-specific geotechnical report, per CBC 2013 requirements and proposed Condition of Certification **GEO-1** and Facility Design Conditions of Certification **GEN-1, GEN-5** and **CIVIL-1**, in the **Facility Design** section of this analysis.

Dynamic Compaction

Dynamic compaction of soils results when relatively unconsolidated granular materials experience vibration associated with seismic events. The vibration causes a decrease in soil volume, as the soil grains tend to rearrange into a more dense state (an increase in soil density). The decrease in volume can result in settlement of overlying structural improvements.

In order to estimate the amount of post-earthquake settlement of site soils, Ninyo & Moore used seismically induced cyclic stress ratios and corrected blow counts (N-values) to calculate the potential volumetric strain of the soil (Ninyo 2013). Their analysis indicated that seismically induced settlement at the project site would be approximately 2 inches or less.

The potential for and mitigation of the effects of dynamic compaction of proposed site soils during an earthquake should be addressed in a project-specific geotechnical report, per CBC 2013 requirements and proposed Conditions of Certification **GEO-1**, and Facility Design Conditions of Certification **GEN-1**, **GEN-5** and **CIVIL-1** (see **Facility Design** section within this document). Common mitigation methods would include deep foundations (driven piles; drilled shafts) for severe conditions, geogrid reinforced fill pads for moderate severity and over-excavation and replacement for areas of minimal hazard.

Compressible Soils

Compressible soils are generally those soils that undergo consolidation when exposed to new loading, such as fill placement or building construction. Buildings, structures and other improvements may be subject to excessive settlement-related distress when built above compressible soils. Settlement of sufficient magnitude to cause significant structural damage is normally associated with rapidly deposited alluvial soils.

The potential for and mitigation of the effects of consolidation of site soils should be addressed in a project-specific geotechnical report, per CBC 2013 requirements and proposed Condition of Certification **GEO-1**, and Facility Design Conditions of Certification **GEN-1**, **GEN-5** and **CIVIL-1** (see **Facility Design** section within this document). Typical mitigation measures would include over-excavation/replacement, mat foundations or deep foundations, depending on severity and foundation loads.

Expansive Soils

Soil expansion occurs when clay-rich soils with an affinity for water exist in-place at a moisture content below their plastic limit. The addition of moisture from irrigation, precipitation, capillary tension, water line breaks, etc. causes the clay soils to absorb water molecules into their structure, which in turn causes an increase in the overall volume of the soil. This increase in volume can correspond to excessive movement (heave) of overlying structural improvements. The potential for and mitigation of the effects of expansive soils on the proposed site should be addressed in a project-specific geotechnical report, per CBC 2013 requirements and proposed Conditions of Certification **GEO-1**, and Facility Design Conditions of Certification **GEN-1**, **GEN-5** and

CIVIL-1 (see **Facility Design** section within this document). Mitigation would normally be accomplished by over-excavation and replacement of the expansive soils. For deep-seated conditions, deep foundations are commonly used. Lime-treated (chemical modification) is often used to mitigate expansive clays in pavement areas.

Corrosive Soils

The project site is located in a geologic environment that could potentially contain soils that are corrosive to concrete and metals. Corrosive soils are defined as having earth materials with more than 500 ppm chlorides, a sulfate concentration of 0.20 percent (i.e., 2,000 ppm) or more, a pH of less than 5.5, or an electrical resistivity of less than 1,000 ohm-centimeters.

Corrosive soil conditions may exacerbate the corrosion hazard to buried conduits, foundations, and other buried concrete or metal improvements. Corrosive soil could cause premature deterioration of underground structures or foundations. Constructing project improvements on corrosive soils could have a significant impact to the project.

Laboratory testing of soils collected during the geotechnical evaluation conducted for ESEC Units 5-8 indicate that soils in the project area may be classified as non-corrosive (Ninyo 2010). As that evaluation was conducted on the property adjacent to the proposed project site, the potential for and mitigation of the effects of corrosive soils on the project site should be addressed in a project-specific geotechnical report, per CBC 2013 requirements and proposed Conditions of Certification **GEO-1**, and Facility Design Conditions of Certification **GEN-1**, **GEN-5** and **CIVIL-1** (see **Facility Design** section within this document). Mitigation of corrosive soil conditions may involve the use of concrete resistant to sulfate exposure. Corrosion protection for metals may be needed for underground foundations or structures in areas where corrosive groundwater or soil could potentially cause deterioration. Typical mitigation techniques include epoxy and metallic protective coatings, the use of alternative (corrosion resistant) materials, and selection of the appropriate type of cement and water/cement ratio.

Landslides

Landslides occur when masses of rock, earth, or debris move down a slope, including rock falls, deep failure of slopes, and shallow debris flows. Landslides are influenced by human activity (mining and construction of buildings, railroads, and highways) and natural factors (geology, precipitation, and topography). Frequently, they accompany other natural hazards. Although landslides sometimes occur during earthquake activity, earthquakes are rarely their primary cause.

The most common cause of a landslide is an increase in the down slope gravitational stress applied to slope materials (oversteepening). This may be produced either by natural processes or human activities. Undercutting of a valley wall by stream erosion is a common way in which slopes may be naturally oversteepened. Other ways include excessive rainfall or irrigation on a cliff or slope.

A cut slope approximately 70 feet high makes up the eastern border of the site. This slope is heavily vegetated and is cut into semi-consolidated dune sand. 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 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 5 through 8. The potential for and mitigation of the effects of landslides on the proposed site should be addressed in a project-specific geotechnical report, per CBC 2013 requirements and proposed Conditions of Certification **GEO-1**, and Facility Design Conditions of Certification **GEN-1, GEN-5 and CIVIL-1** (see **Facility Design** section in this document).

Tsunamis and Seiches

Tsunamis are large-scale seismic-sea waves caused by offshore earthquakes, submarine landslides and/or volcanic activity. Seiches are waves generated within enclosed water bodies such as bays, lakes or reservoirs caused by seismic shaking, rapid tectonic uplift, basin bottom displacement and/or land sliding.

A tsunami can be categorized as local, regional, or Pacific-wide. Those terms describe the potential destruction relative to the tsunami source area.

Local (near-source) tsunamis occur soon after the generating event and allow little time for warning and evacuations. Their impact may be large, but in a limited area. For example, in 1958, waves from a local tsunami in Lituya, Alaska ran up 485 meters, but destruction was focused on a small area.

Regional (intermediate) tsunamis are by far the most common. Destruction may be limited because the energy released was not sufficient to generate a destructive Pacific-wide tsunami, or because the source area limited the destructive potential of the tsunami. These events can occur within 15 minutes to 2 hours after the generating event. Areas affected by the tsunamis may not have felt the generating event.

Pacific-wide (distant source) tsunamis are much less frequent, but have a far greater destructive potential. The waves are not only larger initially, but they subject distant coastal areas to their destructive impact as they cross the Pacific basin. For example, the Chilean tsunami of May 22, 1960, spread death and destruction across the Pacific from Chile to Hawaii, Japan, and the Philippines. These events may have long lead times (up to 6 hours), but the breadth of the destruction is wide (OES 1998).

All of coastal California is at risk from tsunamis (CSSC 2005). Eighty-two possible or confirmed tsunamis have been observed or recorded in California during historic times. Most of these events were small and only detected by tide gages. Eleven were large enough to cause damage and four events caused deaths (CSSC 2005). Two tsunami events caused major damage.

Tsunamis that damaged California’s coast have come from all around the Pacific basin including South America and Alaska. However, damaging tsunamis can also be caused by local offshore faults or coastal and submarine landslides. These local sources have the potential to cause locally greater wave heights and do pose a threat to the state. The largest historic local-source tsunami on the west coast was caused by the 1927

Point Arguello, California, earthquake that produced waves of about 7 feet in the nearby coastal area (CSSC 2005).

Studies have been conducted to evaluate the potential generation of tsunamis from earthquakes originating in the inner Continental Borderland (Legg 2002). These studies indicate that the Catalina fault is the most likely source of local tsunami generation. The Catalina fault is the northern continuation of the San Diego Trough fault zone discussed above (Ryan 2012). Near Catalina, the fault changes orientation to a more westerly trend forming a restraining bend. At this bend, crustal compression occurs and subsequent deformation creates up lift. Depending on the amount of underwater crustal uplift that takes place, a tsunami could be generated. Additionally, amplification of the wave form can occur due to ocean floor bathymetry causing wave refraction and constructive interference or wave amplification (Legg 2002). Areas considered susceptible to tsunami wave amplification include the coast from Los Angeles and Long Beach harbors to Newport Beach. Legg further states "*proximity to the coastal zone of urban Los Angeles and Orange Counties, orientation so as to direct tsunami energy towards the southern California coast and size of seafloor uplift (exceeding 1,300 square kilometers and almost 2,000 meters of seafloor relief) suggests that the Santa Catalina Island restraining bend represents the most serious local tsunami threat to coastal southern California*" (Legg 2002). Based on detailed earthquake modeling using variable earthquake scenarios, Legg determined the maximum runup of a tsunami in the project area caused by an earthquake on the Catalina Island restraining bend would have a height between 1.5 to 2.2 meters (5 to 7.2 feet) (Legg 2002).

In addition to tsunamis generated by earthquake rupture of the seafloor, the possibility that major tsunamis could be generated by massive submarine slumps was recognized a century ago (Synolakis 2002). In more recent years, a variety of studies has supported the scenario of the generation of a major tsunami by a large submarine mass failure, itself induced or triggered by a large earthquake in a coastal area. In addition to the classical documented cases of Grand Banks in 1929, Kalapana, Hawaii in 1975 and the ongoing speculation about the great 1946 Aleutian tsunami, careful analyses of run-up patterns along shorelines often reveal a peaked distribution, with very intense and localized maxima, generally attributed to a local submarine mass failure, against the background of a more regular wave amplitude reflecting the coseismic dislocation (Synolakis 2002). This would be the case, in particular, for localities in Prince William Sound during the great 1964 Alaska earthquake, at Riangkroko during the 1992 Flores, Indonesia event, and during the recent Izmit, Turkey earthquake (Yal¸ciner *et al* . 1999). This scenario can also explain minor tsunamis during strike–slip earthquakes on nearby on-land faults, for example, following the 1989 Loma Prieta earthquake (Ma *et al* . 1991). It is clear that the exact timing of failure in this framework is variable, but delays of a few minutes to a few tens of minutes could easily be attributed to the complex nucleation of a failure plane in metastable sediment, or to a mild secondary trigger (aftershock) tipping a precarious balance (Murty 1979).

Characteristics of tsunamis generated by the two kinds of sources can be compared in very general terms by considering the vertical deformation of the sea floor caused by either event. Catastrophic earthquakes can result in coherent surface rupture over long distances (Kanamori 1975) with vertical displacement usually reaching several meters

(Plafker 1965). Tsunamis generated by seafloor displacement caused by earthquakes typically have long wavelengths and long periods and have a high potential for transoceanic travel and subsequent impact to distant shores. Conversely, the linear dimension of an underwater landslide rarely exceeds 100 km (Piper 1987). However the areal dimension of the sliding mass could easily reach hundreds of square meters (Piper 1987). Tsunamis caused by submarine mass failures are more geographically contained, although they may give rise to higher amplitudes in the local field (Plafker 1969).

Current research has demonstrated that modeling of landslide tsunami hazards requires information and data from seismology, marine geology, geotechnical engineering and hydrodynamics (Bardet 2003). The outcomes of hydrodynamic simulations were found to depend largely on the assumptions made on the geological and geotechnical processes governing mass failures. These discoveries raised fundamental issues in the modeling of tsunamis, especially about the prediction of future mass failure events.

Thirty years of surveys have shown that the slopes of the southern California Borderland contain a large number of landslide deposits (Lee 2009). The submarine landslide most likely to affect the ESEC site is the Palos Verdes debris avalanche. The Palos Verdes debris avalanche occurs on one of the steepest slopes in the Los Angeles offshore region (Lee 2000). Should it catastrophically reactivate, the Palos Verdes debris avalanche would likely cause a tsunami run-up of up to 3 meters (10 feet) over a 30 kilometer (18 mile) long stretch of low-lying coastline (Lee 2009).

The California Geological Survey has published tsunami inundation maps for the entire California coastline (CGS 2009). Initial tsunami modeling was performed by the University of Southern California (USC) Tsunami Research Center funded through the California Emergency Management Agency (CalEMA) by the National Tsunami Hazard Mitigation Program. A suite of tsunami source events was selected for modeling, representing realistic local and distant earthquakes and hypothetical extreme undersea, near-shore landslides. Local tsunami sources that were considered include offshore reverse-thrust faults, restraining bends on strike-slip fault zones and large submarine landslides capable of significant seafloor displacement and tsunami generation. Distant tsunami sources that were considered include great subduction zone events that are known to have occurred historically (1960 Chile and 1964 Alaska earthquakes) and others which can occur around the Pacific Ocean “Ring of Fire.”

As a disclaimer, the map states that it is not a legal document and does not meet disclosure requirements for real estate transactions nor for any other regulatory purpose (CGS 2009). However, the inundation map has been compiled with best currently available scientific information. The inundation line represents the maximum considered tsunami run-up from a number of extreme, yet realistic, tsunami sources. The map indicates that the areas in the site vicinity that are situated at elevations less than 7 feet above sea level could be inundated by a tsunami (**GEOLOGY AND PALEONTOLOGY - FIGURE 7**).

Based on modeling a dozen distant and local “worst case” sources, and modeling at MHW (Mean High Water) conditions, CGS determined that the maximum flood elevations from the modeling in the area of the project are about 11 feet above MSL (Mean Sea Level). The two sources that could produce this maximum flood level are a magnitude 7.6 earthquake from the Catalina 7 local scenario and a magnitude 9.2 earthquake from the Alaska-Aleutians 3 scenario. The beach heights in the project area are very close to 11 feet MSL. Again, the worst-case scenario is that tsunami flood elevations could reach 11 feet MSL near the site but it would take quite large events to produce such flooding (CEC 2013). Therefore, it is unlikely that the project would be affected by tsunami during its design life.

U.S. Building codes generally have not addressed the subject of designing structures in tsunami zones. FEMA’s Coastal Construction Manual (FEMA 55), developed to provide design and construction guidance for residential structures built in coastal areas, addresses seismic loads for coastal structures and provides information on tsunami and associated loads (CSSC 2005). FEMA 55 cites ASCE Standard ASCE 7-10, *Minimum Design Loads for Buildings and Other Structures* as the reference to be consulted during design of structures. ASCE 7-10 is codified in CBC 2013.

A seiche is a standing wave in an enclosed or partially enclosed body of water. The effect is caused by resonances in a body of water that has been disturbed by one or more of a number of factors, most often meteorological effects (wind and atmospheric pressure variations), seismic activity or by tsunamis. Seiches and seiche-related phenomena have been observed on lakes, reservoirs, swimming pools, bays, harbors and seas. The key requirement for formation of a seiche is that the body of water be at least partially bounded, allowing the formation of the standing wave. There are no standing bodies of water in the project vicinity. The elevated surface of the project site would isolate the project from any perceived inundation and the likelihood of a seiche or a tsunami impacting the site is considered low.

The potential for and mitigation of the effects of tsunami or seiche caused inundation on the proposed site should be addressed in a project-specific geotechnical report, per CBC 2013 requirements and proposed Conditions of Certification **GEO-1**, and Facility Design Conditions of Certification **GEN-1**, **GEN-5** and **CIVIL-1** (see **Facility Design** section within this document). Mitigation of tsunami run-up hazards includes structural and civil engineering evaluation, strengthening of seafront structures and providing emergency warning systems. Structural reinforcement at the site can be included for tsunami protection, as deemed appropriate at the detailed design stage by the project structural engineer.

OPERATION IMPACTS AND MITIGATION

Operation of the proposed plant facilities should not have any adverse impact on geologic, mineralogic, or paleontologic resources. Once the plant is constructed and operating, there would be no further disturbances that could affect these resources.

Potential geologic hazards, including strong ground shaking, ground subsidence, liquefaction, settlement due to compressible soils, hydrocompaction, or dynamic compaction, corrosive soils and the possible presence of expansive clay soils can be effectively mitigated through facility design such that these potential hazards should not affect future operation of the facility. Compliance with Condition of Certification **GEO-1**, and Conditions of Certification **GEN-1, GEN-5** and **CIVIL-1** in the **Facility Design** section of this document, would ensure the project is constructed to current seismic building standards and potential impacts would be mitigated in accordance with current standards of engineering practice.

CUMULATIVE IMPACTS AND MITIGATION

No geologic and mineralogic resources have been identified in the project area. The site has not been identified as containing a significant mineral deposit that should be protected. Development of this project is not expected to lead to a significantly cumulative effect on geologic and mineralogic resources within the project area.

The PRR for paleontological monitoring conducted during construction operations on the other half of the property (ESEC Units 5 through 8), documents the discovery of 251 whole and partial fossil specimens. It is highly likely that similar conditions and similar discoveries will be made during construction of ESPFM units 9 through 12.

If significant paleontological resources are uncovered during construction of ESPFM units 9 through 12, they would be protected and preserved in accordance with Conditions of Certification **PAL-1** through **PAL-8**. These conditions would also mitigate any potential cumulative impacts.

The proposed ESPFM would be situated in an active geologic environment. Strong ground shaking potential must be mitigated through foundation and structural design as required by the CBC 2013. The potential for lateral spreading and liquefaction must be addressed and mitigated through appropriate facility design. Compressible soils and soils that may be subject to settlement due to dynamic compaction, must be addressed and mitigated in accordance with a design-level geotechnical investigation as required by the CBC 2013, and proposed Conditions of Certification **GEO-1**, and Facility Design Conditions of Certification **GEN-1**, **GEN-5** and **CIVIL-1** (see **Facility Design** section in this document)**.**

FACILITY CLOSURE

Future facility closure activities would not be expected to impact geologic or mineralogic resources since no such resources are known to exist at either the project location or along its proposed linears. In addition, the decommissioning and closure of the proposed project should not negatively affect geologic, mineralogic, or paleontologic resources since the majority of the ground disturbed during plant decommissioning and closure would have been already disturbed, and mitigated as required, during construction and operation of the project.

NOTEWORTHY PUBLIC BENEFITS

Paleontological monitoring was conducted by the project owner during recent construction of the adjacent ESEC Units 5-8. The results of that monitoring were compiled and presented in the PPRR. The PRR documents the discovery of 251 valuable paleontological resources during construction of ESEC Units 5-8 (JMA 2014). If, during construction of ESPFM, paleontological resources are discovered, recovered and curated, the paleontological data base for the project region could be enhanced and additional knowledge of prehistoric environmental conditions could be determined.

RESPONSE TO AGENCY AND PUBLIC COMMENTS

No comments regarding the geology or paleontology of the project site were received. Therefore, no responses to agency or public comments are provided in this document.

CONCLUSIONS

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

The ESEC site is located in a geologically active area along the coast of Southern California.

The site is not underlain by an active fault and the site is not subject to surface fault rupture. The site's most proximal known active fault is a segment of the Palos Verdes fault which is located approximately five miles south of the proposed project site. Numerous other active faults are located in both the onshore and offshore vicinity of the project site.

Because of its geologic setting, the site could be subject to very strong levels of earthquake-related ground shaking. The significant effects of strong ground shaking on the ESPFM structures must be mitigated through structural designs required by the most recent edition of the California Building Code (currently CBC 2013). CBC 2013 requires that structures be designed to resist seismic stresses from anticipated maximum ground acceleration.

In addition to strong seismic shaking, the project may be subject to soil failure caused by liquefaction and/or dynamic compaction. A design-level geotechnical investigation required for the project by the CBC 2013, and proposed Conditions of Certification **GEO-1** and proposed Facility Design Conditions of Certification **GEN-1**, **GEN-5** and **CIVIL-1** (see **Facility Design** section within this document), would present standard engineering design requirements for mitigation of strong seismic shaking, liquefaction and potential excessive settlement due to dynamic compaction.

While not likely to occur during the project design life, the site is subject to inundation by tsunami. U.S. Building codes generally have not addressed the subject of designing structures in tsunami zones (Reynolds 2013). FEMA's Coastal Construction Manual (FEMA 55), developed to provide design and construction guidance for structures built in coastal areas, addresses seismic loads for coastal structures and provides information on tsunami and associated loads (CSSC 2005).

Petroleum is the only economic geologic resource in the project vicinity. The project site 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. Other than petroleum, there are no known viable minerologic or geologic resources at the proposed ESPFM site.

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. Paleontological monitoring was conducted by the project owner during recent construction of the adjacent ESEC property. The results of that monitoring were compiled and presented in the PPRR. The PRR documents the discovery of 251 valuable paleontological resources during construction of ESEC Units 5-8.

If, similar to ESEC Units 5-8, paleontological resources are discovered during construction of ESPFM Units 9-12, conditions of certification which outline required procedures to mitigate adverse affects to paleontological resources are proposed to be included as part of this project's approval.

Based on this information, Energy Commission staff believes that the potential adverse cumulative impacts to project facilities from geologic hazards during its design life are less than significant. Similarly, staff believes the potential adverse cumulative impacts to potential geologic, mineralogic, and paleontologic resources from the construction, operation, and closure of the proposed project, if any, are less than significant. It is staff's opinion that the proposed ESPFM can be designed and constructed in accordance with all applicable LORS, and in a manner that both protects environmental quality and assures public safety.

PROPOSED CONDITIONS OF CERTIFICATION

The conditions of certification presented in the Final Decision remain applicable to this amended project. In addition, staff has proposed modifications to some of the conditions of certification as shown below. (**Note:** Deleted text is in ~~strikethrough~~, new text is **bold and underlined**). Condition of Certification **PAL-7** has been modified with proposed language that clarifies the responsibility of the PRS to describe the sensitivity and significance of discovered paleontological resources in the PRR required in **PAL-7**. Proposed Condition of Certification **PAL-8** has been added to assure that the components described in the Paleontological Resources Monitoring and Mitigation Plan (PRMMP), (required in Condition of Certification **PAL-3**) is adequately performed.

General conditions of certification with respect to engineering geology are proposed under Conditions of Certification **GEN-1, GEN-5**, and **CIVIL-1** in the **Facility Design** section and in **GEO-1** of this section. Proposed Paleontological Conditions of Certification **PAL-1** through **PAL-8** follow.

It is staff's opinion that the likelihood of encountering paleontologic resources could be high in areas where native Pleistocene age deposits occur. Staff would consider reducing monitoring intensity, at the recommendation of the project PRS, following examination of sufficient, representative excavations that fully describe site stratigraphy.

GEO-1 A Soils Engineering Report as required by Section 1803 of the California Building Code (CBC 2013), shall specifically include laboratory test data, associated geotechnical engineering analyses, and a thorough discussion of seismicity; liquefaction; dynamic compaction; compressible soils; corrosive soils; and tsunami. In accordance with CBC 2013, the report should also include recommendations for ground improvement and/or foundation systems necessary to mitigate these potential geologic hazards, if present.

Verification: The project owner shall include in the application for a grading permit a copy of the Soils Engineering Report which addresses the potential for strong seismic shaking; liquefaction; dynamic compaction; settlement due to compressible soils; corrosive soils: and tsunami, and a summary of how the results of the analyses were incorporated into the project foundation and grading plan design for review and comment by the Chief Building Official (CBO). A copy of the Soils Engineering Report, application for grading permit and any comments by the CBO are to be provided to the CPM at least 30 days prior to grading.

PAL-1 The project owner shall provide the compliance project manager (CPM) with the resume and qualifications of its paleontological resource specialist (PRS) for review and approval. If the approved PRS is replaced prior to completion of project mitigation and submittal of the paleontological resources report (PRR), the project owner shall obtain CPM approval of the replacement PRS. The project owner shall keep resumes on file for qualified paleontological resources monitors (PRMs). If a PRM is replaced, the resume of the replacement PRM shall also be provided to the CPM for review and approval.

The PRS resume shall include the names and phone numbers of references. The resume shall also demonstrate to the satisfaction of the CPM the appropriate education and experience to accomplish the required paleontological resource tasks.

As determined by the CPM, the PRS shall meet the minimum qualifications for a vertebrate paleontologist as described in the Standard Procedures for the Assessment and Mitigation of Adverse Impacts to Paleontological Resources by the Society of Vertebrate Paleontology (SVP 2010). The experience of the PRS shall include the following:

1. Institutional affiliations, appropriate credentials, and college degree;

2. Ability to recognize and collect fossils in the field;
3. Local geological and biostratigraphic expertise;
4. Proficiency in identifying vertebrate and invertebrate fossils; and
5. 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 project owner shall ensure that the PRS obtains qualified paleontological resource monitors to monitor as he or she deems necessary on the project. paleontologic resource monitors (PRMs) shall have the equivalent or combination of the following qualifications approved by the CPM:

- BS or BA degree in geology or paleontology and one year of experience monitoring in California; or
- AS or AA in geology, paleontology, or biology and four years' experience monitoring in California; or
- 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 to the CPM, whose approval must be obtained.

(2) At least 20 days prior to ground disturbance, the PRS or project owner shall provide a letter with resumes naming anticipated PRMs for the project. The letter shall state that the identified monitors meet the minimum qualifications for paleontological resource monitoring as required by this condition of certification. If additional monitors are obtained during the project, the PRS shall provide additional letters and resumes to the CPM. The letter shall be provided to the CPM for approval no later than one week prior to the monitor's beginning on-site duties.

(3) Prior to any change in the PRS, the project owner shall submit the resume of the proposed new PRS to the CPM for review and approval.

PAL-2 The project owner shall provide to the PRS and the CPM, for approval, maps and drawings showing the footprint of the power plant, construction lay down areas, and all related 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 be acceptable for this purpose. The plan drawings should show the location, depth, and extent of all ground disturbances and be at a scale between 1 inch = 40 feet and 1 inch = 100 feet. If the footprint of the project or

its linear facilities change, the project owner shall provide maps and drawings reflecting those changes to the PRS and CPM.

If construction of the project proceeds 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. Before work commences on affected phases, the project owner shall notify the PRS and CPM of any construction phase scheduling changes.

At a minimum, the project owner shall ensure that the PRS or PRM consults weekly with the project superintendent or construction field manager to confirm area(s) to be worked the following 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 to the PRS and CPM.

(2) If there are changes to the footprint of the project, revised maps and drawings shall be provided to the PRS and CPM 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-3 The project owner shall ensure that the PRS prepares a Paleontological Resources Monitoring and Mitigation Plan (PRMMP) and submits the PRMMP to the CPM for review and approval. 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. The PRMMP shall be used as the basis of discussion when on-site decisions or changes are proposed. Copies of the PRMMP shall include all updates and 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 Vertebrate Paleontology (SVP 2010) 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 collection, identification and inventory, preparation of final reports, and transmittal of materials for curation will be performed according to PRMMP procedures;

2. Identification of the person(s) expected to assist with each of the tasks identified within the PRMMP and these conditions of 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 sampling is needed, a description of the sampling methodology,, and how much sampling is expected to take place in which geologic units. Include descriptions of different sampling procedures that shall be used for fine-grained and coarse-grained units;

5. A discussion of the locations of where the monitoring of project construction activities is deemed necessary, and a proposed plan for monitoring and sampling at these locations;

6. A discussion of procedures to be followed: (a)in the event of a significant fossil discovery, (b) stopping construction, (c) resuming construction, and (d) how notifications will be performed;

7. A discussion of equipment and supplies necessary for collection 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 meet the Society of Vertebrate Paleontology's standards and requirements for the curation of paleontological resources;

9. Identification of the institution that has agreed to receive data and fossil materials collected, 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 30 days prior to ground disturbance, the project owner shall provide a copy of the PRMMP to the CPM. Approval of the PRMMP by the CPM shall occur prior to any ground disturbance. The PRMMP shall include an affidavit of authorship by the PRS, and acceptance of the PRMMP by the project owner evidenced by a signature.

PAL-4 Prior to ground disturbance the project owner and the PRS shall prepare a CPM-approved Worker Environmental Awareness Program (WEAP).

The WEAP shall address the possibility of encountering paleontological resources in the field, the sensitivity and importance of these resources, and legal obligations to preserve and protect those resources. The purpose of the WEAP is to train project workers to recognize paleontologic resources and identify procedures they should follow to ensure there are no impacts to sensitive paleontologic resources. The WEAP shall include:

1. A discussion of applicable laws and penalties under the law;
2. Good quality photographs or physical examples of vertebrate fossils for project sites containing units of high paleontologic sensitivity;
3. Information that the PRS or PRM has the authority to stop or redirect construction in the event of a discovery or unanticipated impact to a paleontological resource;
4. Instruction that employees are to stop 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 WEAP certification of completion form signed by each worker indicating that he/she has received the training; and
7. A sticker that shall be placed on hard hats indicating that environmental training has been completed.

The Project Owner shall also submit the training script and, if the project owner is planning to use a video for training, a copy of the training video with the set of reporting procedures for workers to follow that will be used to present the WEAP and qualify workers to conduct ground disturbing activities that could impact paleontologic resources.

Verification:

(1) At least 30 days prior to ground disturbance, the project owner shall submit to the CPM for review and comment the draft WEAP, including the brochure and sticker. The submittal shall also include a draft training script and, if the project owner is planning to use a video for training, a copy of the training video with the set of reporting procedures for workers to follow.

(2) At least 15 days prior to ground disturbance, the project owner shall submit to the CPM for approval the final WEAP and training script.

PAL-5 No worker shall excavate or perform any ground disturbance activity prior to receiving CPM-approved WEAP training by the PRS, unless specifically approved by the CPM.

Prior to project kick-off and ground disturbance the following workers shall be WEAP trained by the PRS in-person: project managers, construction supervisors, foremen, and all general workers involved with or who operate ground-disturbing equipment or tools. Following project kick-off, a CPM-approved video or in-person training may be used for new employees. The training program may be combined with other training programs prepared for cultural and biological resources, hazardous materials, or other areas of interest or concern. A WEAP certification of completion form shall be used to document who has received the required training.

Verification:

(1) In the Monthly Compliance Report (MCR), the project owner shall provide copies of the WEAP certification of completion forms with the names of those trained and the trainer or type of training (in-person and/or video) offered that month. An example of a suitable WEAP certification completion form is provided below. The MCR shall also include a running total of all persons who have completed the training to date.

(2) If the project owner requests an alternate paleontological WEAP trainer, the resume and qualifications of the trainer shall be submitted to the CPM for review and approval prior to installation of an alternate trainer. Alternate trainers shall not conduct WEAP training prior to CPM authorization.

PAL-6 The project owner shall ensure that the PRS and PRM(s) monitor, consistent with the PRMMP, all construction-related grading, excavation, trenching, and augering in areas where potential fossil-bearing materials have been identified, both at the site and along any constructed linear facilities associated with the project. 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 project owner shall notify and seek the concurrence of the CPM.

The project owner shall ensure that the PRS and PRM(s) have the authority to stop 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 from the accepted schedule in the PRMMP shall be proposed in a letter or email from the PRS and the project owner to the CPM prior to the change in monitoring and be included in the monthly compliance report. The letter or email shall include the justification for the change in monitoring and be submitted to the CPM for review and approval.
2. The project owner shall ensure that the PRM(s) keep a daily monitoring log of paleontological resource activities. The PRS may informally discuss paleontological resource monitoring and mitigation activities with the CPM at any time.
3. The project owner shall ensure that the PRS notifies the CPM within 24 hours of the occurrence 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 within 24 hours, or Monday morning in the case of a weekend event, when construction has been stopped because of a paleontological find.

The project owner shall ensure that the PRS prepares a summary of monitoring and other paleontological activities that will be included in each MCR. The summary will include the name(s) of PRS or PRM(s) active during the month, general descriptions of training and monitored construction activities, and general locations of excavations, grading, and other activities. A section of the report shall include the geologic units or subunits encountered, descriptions of samplings within each unit, and a list of identified fossils. 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 or any changes to the monitoring plan that have been approved by the CPM. If no monitoring took place during the month, the report shall include an explanation in the summary as to why monitoring was not conducted.

Verification: The project owner shall ensure that the PRS submits the summary of monitoring and paleontological activities in the MCR. When feasible, the CPM shall be notified 10 days in advance of any proposed changes in monitoring different from that identified in the PRMMP. If there is any unforeseen change in monitoring, the notice shall be given as soon as possible prior to implementation of the change.

PAL-7 The project owner shall ensure preparation of a Paleontologic 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 collected fossil materials and related information and submit it to the CPM for review and approval.

The report shall include, but ~~is~~ not **be** limited to, a description and inventory of recovered fossil materials; a map showing the location of paleontologic resources encountered; determinations of sensitivity and significance; and **the PRS' description of sensitivity and significance of those resources** ~~a statement by the PRS that project impacts to paleontologic resources have been mitigated below the level of significance~~.

Verification: Within 90 days after completion of ground-disturbing activities, including landscaping, the project owner shall submit the PRR under confidential cover to the CPM.

PAL-8 The project owner, through the designated PRS, shall ensure that all components of the PRMMP are adequately performed, including collection of fossil material, preparation of fossil material for analysis, analysis of fossils, identification and inventory of fossils, preparation of fossils for curation, and delivery for curation of all significant paleontological resource materials encountered and collected during project construction. The project owner shall pay all curation fees charged by the museum for fossil material collected and curated as a result of paleontological mitigation. The project owner shall also provide the curator with documentation showing the project owner irrevocably and unconditionally donates, gives, and assigns permanent, absolute, and unconditional ownership of the fossil material.

Verification: **Within 60 days after the submittal of the PRR, the project owner shall submit documentation to the CPM showing fees have been paid for curation and the owner relinquishes control and ownership of all fossil material.**

Certification of Completion
Worker Environmental Awareness Program
El SEGUNDO ENERGY CENTER (00-AFC-14C)

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, paleontological, and biological resources for all personnel (that is, construction supervisors, crews, and plant operators) working on site or at related facilities. By signing below, the participant indicates that he/she understands and shall abide by the guidelines set forth in the program materials. Include this completed form in the Monthly Compliance Report.

No.	Employee Name	Title/Company	Signature
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Cultural Trainer: _____ Signature: _____ Date: ___/___/____

PaleoTrainer: _____ Signature: _____ Date: ___/___/____

Biological Trainer: _____Signature:_____ Date: ___/___/__

REFERENCES

Atwater 1998 - Atwater, Tanya M., Plate Tectonic History of Southern California with emphasis on the Western Transverse Ranges and Santa Rosa Island, in Weigand, P.W., ed., Contributions to the Geology of the Northern Channel Islands, Southern California: American Association of Petroleum Geologists, Pacific Section, MP 45, 1998.

Bardet 2003 - Bardet, J.-P., Synolakis, C. E., Davies, H. L., Imamura, F., Okal, E. A., Landslide Tsunamis: Recent Findings and Research Directions, Pure and Applied Geophysics, 2003.

Barrows 1974 - Barrows, A. G., A Review of the Geology and Earthquake History of the Newport–Inglewood Structural Zone, Southern California, California Division of Mines and Geology, Special Report 114, 1974.

BonTerra 2010 - BonTerra Consulting, Paleontological Resources Assessment, Newport Banning Ranch, Newport Beach, California, February 16, 2010.

BonTerra 2011 - BonTerra Consulting, Draft Environmental Impact Report, Newport Banning Ranch Project, City of Newport Beach, State Clearinghouse No. 2009031061, September 9, 2011.

Boore 1997 - Boore, D. M., W. B. Joyner, and T. E. Fumal, “Equations for Estimating Horizontal Response Spectra and Peak Ground Acceleration from Western North American Earthquakes: A Summary of Recent Work”; Seismological Research Letters, Volume 68, Number 1, p. 128-153, 1997.

Borrero 2005 - Borrero, Jose, Sungbin, Cho, Moore, James E.II, Richardson, Harry W., Synolkis, Costas, Could it Happen Here?, Civil Engineering, April 2005.

Bryant 1988 - Recently Active Traces of the Newport-Inglewood Fault Zone, Los Angeles and Orange Counties, California, California Division of Mines and Geology Open File Report 88-14, 1988.

BSSA 1995 - Seismic Hazards in Southern California: Probable Earthquakes, 1994 to 2024 Bulletin of the Seismological Society of America, Vol. 85, No. 2, pp. 379-439, April 1995.

Caltech 2011 - Southern California Earthquake Data Center, Division of Geological and Planetary Sciences, Earthquake Data Base, 1933 to present, California Institute of Technology, 2011. http://www.data.scec.org/.

CBC 2013 - California Code of Regulations, Title 24, California Building Standards Code [CBSC], Part 2, California Building Code (CBC), 2014.

CDC 2010 - California Department of Conservation, Division of Oil and Gas, Oil, Gas, and Geothermal Fields in California, 2010. http://maps.conservation.ca.gov/doms/doms-app.html.

CDMG 1994 - California Division of Mines and Geology, Fault Activity Map of California and Adjacent Areas with Locations and Ages of Recent Volcanic Eruptions, Scale: 1:750,000.

CDMG 1998 - California Division of Mines and Geology, Seismic Hazard Zone Report for the Torrance 7.5-Minute Quadrangle, Los Angeles County, California, 1998.

CDMG 1999a - California Division of Mines and Geology, Seismic Hazard Zone Report for the Venice 7.5-Minute Quadrangle, March 25, 1999.

CDMG 1999b - California Division of Mines and Geology, Mines and Mineral Producers Active in California (1997–1998), Special Publication 103.

CDMG 2003 - California Division of Mines and Geology, Fault Investigation Reports for Development Sites Within Alquist-Priolo Earthquake Fault Zones in Southern California, 1974-2000.

CEC 2013 - California Energy Commission/ Casey Weaver (tn 71382). *Record of Conversation with Rick Wilson at California Geological Survey Regarding Potential Tsunami Run-Up, HBEP, dated 03/05/2013*. Submitted to CEC/Dockets Unit on 06/24/2013.

CGS 2002 - California Geological Survey, California Geomorphic Provinces, Note 36, 2002.

CGS 2007a - California Geological Survey, Fault Rupture Hazard Zones in California, Alquist-Priolo Earthquake Fault Zoning Act with Index to Earthquake Fault Zones Maps, Special Publication 42, Interim Revision 2007.

CGS 2007b - California Geological Survey, California Historical Earthquake Online Database, http://www.consrv.ca.gov/cgs/rghm/quakes/historical/.

CGS 2007c - California Geological Survey, Note 54, Regulatory Earthquake Hazard Zones, Southern California Region, 2007.

CGS 2008 - California Geological Survey - California Public Resources Code, Division 2 Geology, Mines and Mining, Chapter 7.5 Earthquake Fault Zoning, Section 2621-2630 Alquist-Priolo Earthquake Fault Zoning Act, 2008. http://www.consrv.ca.gov/cgs/codes/prc/Pages/chap-7-5.aspx.

CGS 2009 - California Geological Survey, Tsunami Inundation Map for Emergency Planning, State of California, County of Los Angeles, Venice Quadrangle, March 1, 2009.

CGS 2010a - California Geological Survey, Fault Activity Map of California, 2010.

CGS 2010b - California Geological Survey, Probabilistic Seismic Hazards Mapping Ground Motion Page, 2010. http://redirect.conservation.ca.gov/cgs/rghm/pshamap/pshamap.asp

CGS 2014 - Earthquake Zones of Required Investigation, Hollywood Quadrangle, Preliminary Review Map, January 8, 2014.

Chirstensen 2007 - Chirstensen, Todd S., Potential Fossil Yield Classification (PFYC) System, Attachment 1, United States Department of the Interior, Bureau of Land Management, 2007.

Conrad 2008 - Conrad, James E., Ryan, Holly F., Paull, Charles K., Caress, David W., and Sliter, Ray W., The Palos Verdes and Coronado Bank Fault Zones, Inner Continental Borderland, Southern California - Do They Connect?, U.S. Geological Survey, 2008.

Crandall 2001 - Law/Crandall Consultants, Report of Geologic-Seismic Hazards Evaluation for Environmental Impact Report, Proposed High-Rise Office Building and Retail Development, 2000 Avenue of the Stars, Century City District of Los Angeles, California, November 13, 2001.

CSSC 2005 - State of California Seismic Safety Commission, The Tsunami Threat to California, Findings and Recommendations on Tsunami Hazards and Risks, December 2005.

DeCourten 2008 - DeCourten, Frank, Geology of Southern California, Department of Earth Science, Sierra College, 2008. http://www.grossmont.edu/garyjacobson/Naural%20History%20150/Geology%20of%20Southern%20California.pdf.

Dengler 2003 - Dengler, L. and Preuss, J., Mitigation Lessons from the July 17, 1998 Papua New Guinea Tsunami, Pure Appl. Geophys. 160, 2003.

DOGGER 2012 - Department of Conservation/Division of Oil, Gas, and Geothermal Resources, On-Line Mapping System, 2012.

Dolan 1992 - Dolan, J.F., and Sieh, K.E., Tectonic Geomorphology of the Northern Los Angeles Basin: Seismic Hazards and Kinematics of Young Fault Movement, in Ehlig, P.K. and Steiner, E.A., eds., Engineering Geology Field Trips, Orange County, Santa Monica Mountains, and Malibu, guidebook and volume: Association of Engineering Geologists, p. B20-B26, 1992.

Dolan 1995 - Dolan, J.F., Sieh, K., Rockwell, T.K., Yeats, R.S., Shaw, J., Suppe, J., Huftile, G., and Gath, E., Prospects for larger or more frequent earthquakes in greater metropolitan Los Angeles: Science 267:188-205, 1995.

Dolan 1997a - Dolan, J.F., and Pratt, T.L, High-resolution seismic reflection profiling of the Santa Monica fault zone, West Los Angeles, California: Geophysical Research Letters 24:2051-2054, 1997.

Dolan 1997b - Dolan, J.F., Sieh, K., Rockwell, T.K., Guptill, P., and Miller, G., Active tectonics, paleoseismology, and seismic hazards of the Hollywood fault, northern Los Angeles Basin, California: Geol. Soc. America Bull. 109:1595-1616, 1997.

Dolan 2000a - Dolan, J.F., Sieh, K., and Rockwell, T.K., , Late Quaternary activity and seismic potential of the Santa Monica fault system, Los Angeles, California: Geol. Soc. America Bull. 112:1559-1581, 2000.

Dolan 2000b - Dolan, J.F., Stevens, D., and Rockwell, T.K., Paleoseismologic evidence for an early- to mid-Holocene age of the most recent surface rupture on the Hollywood fault, Los Angeles, California: Seismol. Soc. America Bull. 90:334-344, 2000.

Dorsey 2002 - Dorsey, R.J., Stratigraphic Record of Pleistocene Initiation and Slip on the Coyote Creek fault, lower Coyote Creek, southern California, In: Barth, A. (ed.) Contributions to Crustal Evolution of the Southwest United States: Boulder, Co. GSA Special Paper 365, p. 251-269, 2002.

Easterbrook 2011 - Easterbrook, Don J., The Little Ice Age (1300 A.D. to the 20th century), Magnitude and Range of Climate Change, Dept. of Geology, Western Washington University, January 26, 2011.

ECI 2000 - Earth Consultants International, Natural Hazard Mapping, Analysis and Mitigation, Safety Element, Riverside County General Plan, August 2000.

El Segundo 1992 - City of El Segundo General Plan, Public Safety Element,1992.

El Segundo 2004 - City of El Segundo General Plan, Circulation Element, September 2004.

NRG 2013 - NRG/El Segundo Energy Center LLC (TN 70442), Petition to Amend,dated April 2013, Submitted to CEC on 04/23/2013.

ESPR 2000 - El Segundo Power II, LLC, Application for Certification (AFC) El Segundo Power Redevelopment Project Volumes I, II, and III, Submitted to the California Energy Commission, December 18, 2000.

ESPR 2001 - El Segundo Power II, LLC, AFT Response to Data Requests, Submitted to the California Energy Commission, March 8, 2001.

EMI 2006 - Earth Mechanics, Inc., Port-Wide Ground Motion Study, Port of Long Beach, California, Final Report, August 2006.

Fisher 2004 - Fisher, Michael A., Normark, William R., Langenheim, Victoria E., Calvert, Andrew J., and Sliter, Ray, Marine Geology and Earthquake Hazards of the San Pedro Shelf Region, Southern California, Professional Paper 1687, U.S. Geological Survey, Reston, Virginia, 2004.

Gamache 2003 - Gamache, Mark T., Frost, Paul L., Urban Development of Oil Fields in the Los Angeles Basin Area, 1983-2001, California Department of Conservation, Division of Oil, Gas, and Geothermal Resources, 2003.

Gath 1988 - Gath, E. M., Hanson, J. H., Clark, B. R., and Rockwell, T. K., The Whittier fault in southern California; preliminary results of investigations: Eos,v. 69, p. 260, 1988.

GMU 2011 - GMU Geotechnical, Inc., Report of Geotechnical Studies, Proposed Newport Banning Ranch Development, City of Newport Beach, County of Orange, July 2011.

Grant 1997 - Grant, Lisa B., Rockwell, Thomas K., Waggoner, John T. and von Stein, Carmen, Paleoseismicity of the North Branch of the Newport-Inglewood fault Zone in Huntington Beach, California, From Cone Penetrometer Test Data, Bulletin of the Seismological Society of America, Vol. 87, No. 2, pp. 277-293, April 1997.

Grant 2002 - Grant, Lisa B., Ballenger, Leslie J., Runnerstrom, Eric E., Coastal Uplift of the San Joaquin Hills, Southern Los Angeles Basin, California by a large Earthquake Since A.D. 1635, Bulletin of the Seismological Society of America, Vol. 92, No.2, March 2002.

Grant 2004 - Grant, Lisa B., and Peter M. Shearer, Activity of the Offshore Newport–Inglewood Rose Canyon Fault Zone, Coastal Southern California, from Relocated Microseismicity, Bulletin of the Seismological Society of America, Vol. 94, No. 2, pp. 747–752, April 2004.

GSA 2009 - Earth Science in the Urban Ocean: The Southern California Continental Borderland, The Geological Society of America Special Paper 454, eds. Homa Lee and William Normark, 457 pp., 2009.

Guptill 1981 - Guptil, Paul D., Heath, Edward G., Surface Faulting Along the Newport – Inglewood Zone of Deformation, California Geology, Vol. 34, No. 7, July 1981.

Hart 1999 - Hart, E. W. and Bryant, W. A., Fault-Rupture Hazard Zones in California, Alquist-Priolo Earthquake Fault Zoning Act with Index to Earthquake Fault Zones Maps: California Division of Mines and Geology Special Publication 42, 1999.

IBC 2012 – International Building Code, International Code Council, Washington, D.C.

Jahns 1954 - Jahns, R.H., Geology of the Peninsular Ranges Province, southern California and Baja California: California Division of Mines and Geology Bulletin 170, 1954.

JMA 2014 - John A. Minch and Associates, Paleontologic Monitoring Report, El Segundo Energy Center Project, El Segundo, California, Confidential Consultants Report, January 2014.

Jones 1990 - Jones, L.M., Sieh, K., Hauksson, E., and Hutton, L.K., The 3 December 1988 Pasadena earthquake: Evidence for strike-slip motion on the Raymond fault: Seismol. Soc. America Bull. 80:474-482, 1990.

Kanamori 1970 - Kanamori, H., The Alaska Earthquake of 1964: Radiation of Long-Period Surface Waves and Source Mechanism, J. Geophys. Res. 75, 5029–5040, 1970.

Kanamori 1975 - Kanamori, H, Anderson, D., Amplitude of the Earth's Free Oscillations and Long-period Characteristics of the Earthquake Source, Journal of Geophysical Research, 1975.

Lee 2009 - Lee, Homa J., H,. Gary Greene, Brian D. Edwards, Michael A. Fisher, William R. Normarck, Submarine Landslides of the Southern California Borderland, The Geological Society of America, Special Paper 454, 2009.

Legg 1989 - Legg, M. R., B. P. Luyendyk, J. Mammerickx, C. deMoustier, *and* R. C. Tyce , Sea Beam survey of an active strike-slip fault: The San Clemente fault in the California Continental Borderland, J. Geophys. Res., 94(B2), 1727–1744, 1989.

Legg 2005 - Legg, M. R., Geologic slip on offshore San Clemente fault, Southern California, understated in GPS data, American Geophysical Union, Fall Meeting 2005.

Lempert 2012 - Lempert, Robert, Ryan L. Sriver, and Klaus Keller (RAND), Characterizing Uncertain Sea Level Rise Projections to Support Investment Decision, California Energy Commission, Publication Number: CEC-500-2012-056, July 2012.

Leon 2009 - Leon, Lorraine A., James F. Dolan, John H. Shaw, Thomas L. Pratt, Evidence for Large Holocene Earthquakes on the Compton Thrust Fault, Los Angeles, California, Journal of Geophysical Research: Solid Earth (1978–2012), Volume 114, Issue B12, December 2009.

Lindvall 2001 - Lindvall, Scott C. Rockwell, Thomas K., Kasman, Gerald, and Helms, John G., Style, Activity, and Uplift Rate of the Hollywood Fault in Hollywood and West Hollywood, California, Cordilleran Section - 97th Annual Meeting, and Pacific Section, American Association of Petroleum Geologists (April 9-11, 2001) Universal City, CA, Abstract.

Morton 2004 - Morton, D.M., Preliminary Digital Geologic Map of the Santa Ana 30´ X 60´ Quadrangle, southern California, version 2.0, U.S. Geological Survey Open-File Report 99-172, Version 2.0, 2004.

Morton 2006 - Morton, Douglas M., Miller, Fred K., Geologic map of the San Bernardino and Santa Ana 30' x 60' quadrangles, California, USGS Open-File Report 2006-1217, 2006.

Mueller 1998 - Mueller, Karl, Shaw, John and Rivera, Carlos, Determining the Geometry of the San Joaquin Hills Blind Thrust: Implications for Earthquake Source Characteristics, Progress Report submitted to Southern California Earthquake Center, February 23, 1998.

Mueller 2005 - Mueller, Karl, Analysis of Active Blind Thrust and Fold Hazards in the Southern Los Angeles Basin from Shallow Aquifers and Airborne Swath-Mapped DEM’s, NEHRP Final Technical Report , 2005.

Mueller 2010 - Mueller, Karl, Determining Holocene Uplift Rates on the San Joaquin Hills Blind Thrust, Department of Geological Sciences, University of Colorado, NEHRP Final Technical Report, October 2010.

Murty 1979 - Murty, T. S., Submarine Slide-generated Water Waves in Kitimat Inlet, British Columbia, J. Geophys. Res. 84, 7777–7779, 1979.

Ninyo 2006 - Ninyo & Moore Geotechnical and Environmental Sciences Consultants, Limited Geotechnical Evaluation, NRG El Segundo Power Redevelopment, El Segundo, California, November 10, 2006.

Ninyo 2007a - Ninyo & Moore Geotechnical and Environmental Sciences Consultants, Supplemental Geotechnical Evaluation, NRG El Segundo Power Redevelopment, El Segundo, California, April 6, 2007.

Ninyo 2007b - Ninyo & Moore Geotechnical and Environmental Sciences Consultants, Geotechnical Evaluation, NRG El Segundo Power Redevelopment, El Segundo, California, April 26, 2007.

Ninyo 2010 - Ninyo & Moore Geotechnical and Environmental Sciences Consultants, Geotechnical Evaluation, NRG El Segundo Power Redevelopment, El Segundo, California, September 9, 2010.

Ninyo 2011 - Ninyo & Moore Geotechnical and Environmental Sciences Consultants, Responses to Geotechnical Peer Review Comments, NRG El Segundo Power Redevelopment, El Segundo, California, August 12, 2011.

Ninyo 2013 - Ninyo & Moore Geotechnical and Environmental Sciences Consultants, Final Engineering Geology Report, Units 5 through 8, NRG El Segundo Power Redevelopment Project, El Segundo, California, October 7, 2013.

Norris 1990 - Norris, R. M. and R. W. Webb, Geology of California, Second Edition. John Wiley and Sons, New York, 1990.

NRC 2011 - National Research Council, Tsunami Warning and Preparedness, An Assessment of the U.S. Tsunami Program and the Nation's Preparedness Efforts, The National Academies Press, 2011.

NRG 2013a - NRG/El Segundo Energy Center LLC (TN 70442) Petition to Amend, dated April 2013. Submitted to CEC on 04/23/2013.

OES 1998 - State of California, Governor's Office of Emergency Services, Local Planning Guidance on Tsunami Response, Second Edition, A Supplement to the Emergency Planning Guidance for Local Governments, May 1998.

OPC 2010 - Ocean Protection Council, State of California Sea-Level Rise Interim Guidance Document, Sea-Level Rise Task Force of the Coastal and Ocean Working Group of the California Action Team (CO-CAT), October 2010.

Parrish 2013 - Parrish, John G., Commencement of Alquist-Priolo Fault Zone Study, Hollywood Fault Zone Millennium Hollywood Project; EIR No. ENV-2011-0675-

EIR, letter to Honorable Herb Wesson, President, Los Angeles City Council, July 20, 2013.

Petersen 2008 - Petersen, Mark D., Frankel, Arthur D., Harmsen, Stephen C., Mueller, Charles S., Haller, Kathleen M., Wheeler, Russell L., Wesson, Robert L., Zeng, Yuehua, Boyd, Oliver S., Perkins, David M., Luco, Nicolas, Field, Edward H., Wills, Chris J., and Rukstales, Kenneth S., Documentation for the 2008 Update of the United States National Seismic Hazard Maps: U.S. Geological Survey Open-File Report 2008–1128, 61 p., 2008.

Piper 1987 - Piper, D. J. W. and Aksu, A. E., The Source and Origin of the 1929 Grand Banks Turbidity Current Inferred from Sediment Budgets, Geol. Mar. Lett. 7, 177–182, 1987.

Plafker 1965 - Plafker, G. (1965), Tectonic Deformation Associated with the 1964 Alaskan Earthquake, Science 148, 1675–1687, 1965.

Plafker 1969 - Plafker, G., Kachadoorian, R., Eckel, E. B., and Mayo, L. R. (1969), Effects of the Earthquake of March 27, 1964 on Various Communities, US Geol. Surv. Prof. Paper 542-G, US Geological Survey, Washington, DC., 1969.

Ponti 1989 - Ponti, D.J., Aminostratigraphy and Chronostratigraphy of Pleistocene Marine Sediments, Southwestern Los Angeles Basin, California, PhD dissertation, University of Colorado, 1989.

Poppick 2013 - Laura Poppick, Underwater Robots Help Discover Hidden Faults, Monterey Bay Aquarium Research Institute, January 30, 2013.

Reynolds 2013 - Reynolds, David, Engineers Design Tsunami-Resistant Port in California, ASCE Civil Engineering Magazine, January 15, 2013.

Rockwell 1993 - Rockwell, T.K., et. al., Late Quaternary Slip Rates Along the Agua Blanca Fault, Baja California, Mexico: in Geological Investigations of Baja California: South Coast Geological Society, Annual Field Trip Guidebook, No.21, 1993.

Rogers 1965 - Rogers, T.H., Santa Ana sheet: California Division of Mines and Geology Geologic Map of California, 1965.

Ryan 2009 - Ryan, Holly F., Legg, Mark R., Conrad, James E. and Sliter, Ray W., Recent faulting in the Gulf of Santa Catalina:San Diego to Dana Point, The Geological Society of America, Special Paper 454, 2009.

Schulz 1992 - Schulz, Sandra S., Robert E. Wallace, The San Andreas Fault, U.S. Dept. of the Interior, Geological Survey, 1992.

Scripps 2012 - Scripps Institution of Oceanography, Climate Change and Sea Level Rise Scenarios for California Vulnerability and Adaptation Assessment, A White Paper from the California Energy Commission's California Climate Change Center, July 2012.

SCEC 2001 - SCEC Working Group C*, Active Faults in the Los Angeles Metropolitan Region, SCEC Special Pub. Series, No. 001, Southern California Earthquake Center, September 2001.

SCEDC 2013 - Southern California Earthquake Data Center, California Institute of Technology, on line application, http://www.data.scec.org/, 2013.

Sharp 1965 - Sharp, Robert Victor, Geology of the San Jacinto Fault Zone in the Peninsular Ranges of southern California, Dissertation (Ph.D.), California Institute of Technology, 1965.

Shlemon 2008 - Shlemon, Roy J., Davis, Paul, and Silver, Gregory, Relative Activity of North Branch Splays (NBS) of the Newport-Inglewood Fault Zone, West Newport Oil Field, Newport Beach, California, 2008.

SVP 1995 - Society of Vertebrate Paleontology, Measures for Assessment and Mitigation of Adverse Impacts to Non-Renewable Paleontologic Resources: Standard Procedures.

SVP 2010 - Society of Vertebrate Paleontology, Impact Mitigation Guidelines Revision Committee Standard Procedures for the Assessment and Mitigation of Adverse Impacts to Paleontological Resources, 2010.

Synolakis 2002 - Synolakis, Costas E., Jean-Pierre Bardet, José C. Borrero, Hugh L. Davies, Emile A. Okal, Eli A. Silver, Suzanne Sweet and David R. Tappin, The Slump Origin of the 1998 Papua New Guinea Tsunami, Proceedings of the Royal Society of London, April 8, 2002.

Toppozada 1989 - Toppozada, Tousson R., Bennett, John H., Borchardt, Glenn, Saul, Richard, and Davis, James F., Earthquake Planning Scenario for a Major Earthquake on the Newport-Inglewood Fault Zone, California Geology, Vol. 42, No. 4, April 1989.

Townley 1939 - Townley, S. D., and M. W. Allen, Descriptive Catalog of Earthquakes of Pacific Coast of the United States, 1769-1928. Bulletin of the Seismological Society of America 29 (1), 1-297, 1939.

UCMP 2008 - University of California Museum of Paleontology, Paleontology Collection Locality Records Website: http://ucmpdb.berkeley.edu/.

USGS 2010a - United States Geological Survey Earthquake Search. http://.usgs.gov///epic/_circ.php, 2010.

USGS 2010b - United States Geological Survey, Earthquake Hazards Program, U.S. Seismic “Design Maps” Web Application, 2010. https://geohazards.usgs.gov/secure/designmaps/us/application.php

Wills 1998 - Christopher J. Wills, Cynthia L. Pridmore, and Pamela J. Irvine, Liquefaction Evaluation Report, Liquefaction Zones for the Venice 7.5 Minute

Quadrangle, Los Angeles County, California, Seismic Hazard Zone Report for the Venice Quad, California Department of Conservation, Division of Mines and Geology, 1998.

Wilson 2010 - Wilson, Rick, Barberopoulou, Aggeliki, Synolakis, Costas and Miller, Kevin, California Mapping Program, Tsunami Hazard Mapping Efforts, PEER PTHA Meeting power point presentation handout , UC Berkley, June 17, 2010.

Wood 2013 - Wood, N., Ratliff, J., and Peters, J., Community Exposure to Tsunami Hazards in California, U.S. Geological Survey Scientific Investigations Report 2012-5222, 2013.

Yal¸ciner 1999 - Yal¸ciner, A. C., Borrero, J. C., Kanogˇ lu, U., Watts, P., Synolakis, C. E., and Imamura, F., Field Survey of the 1999 Izmit Tsunami and Modeling Effort of New Tsunami Generation Mechanism, EOS, Trans. Am. Geophys. Union 80, F751, 1999.

Yeats 2010 - Yeats, R.S., Verdugo, D., Subsurface Evidence for the Puente Hills and Compton-Los Alamitos Faults in South-Central Los Angeles, 2010 SCEC Annual Report, 2010.

Yerks 1965 - Yerks, R.F., McCulloh, T.H., Schoellhamer, J.E., and Vedder, J.G., Geology of the Los Angeles Basin California – An Introduction, U.S. Geological Survey Professional Paper 420-A, 1965.

Ziony 1989 - Ziony, J. I., and L. M. Jones, Map showing late Quaternary faults and 1978-1984 seismicity of the Los Angeles region, California, U. S. Geological Survey Misc. Series Map MF-1964, 1989.

GEOLOGY AND PALEONTOLOGY - FIGURE 1

El Segundo Energy Center Amendment (ESEC) - Vicinity Map

CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCE: April 2013 Petition to Amend, 00-AFC-14, Fig. 1-1, CH2MHILL

GEOLOGY AND PALEONTOLOGY - FIGURE 2

El Segundo Energy Center Amendment (ESEC) - Coastal Repower Projects

CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCE: CEC Staff

GEOLOGY AND PALEONTOLOGY - FIGURE 3

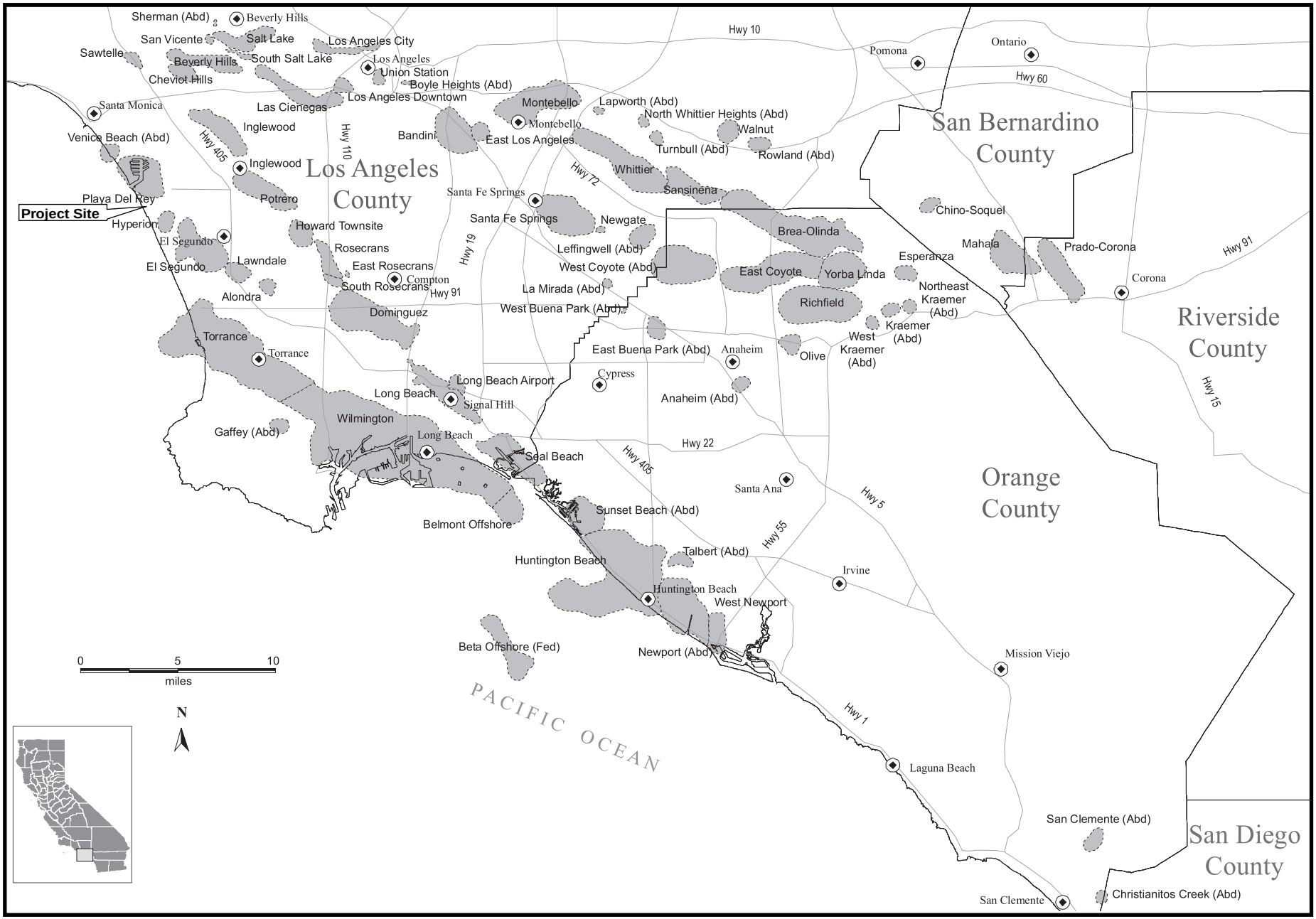
El Segundo Energy Center Amendment (ESEC) - Geomorphic Provinces

CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCE: California Department of Conservation, California Geological Survey, 2002.

GEOLOGY AND PALEONTOLOGY - FIGURE 4

El Segundo Energy Center Amendment (ESEC) - Los Angeles Basin area oil fields



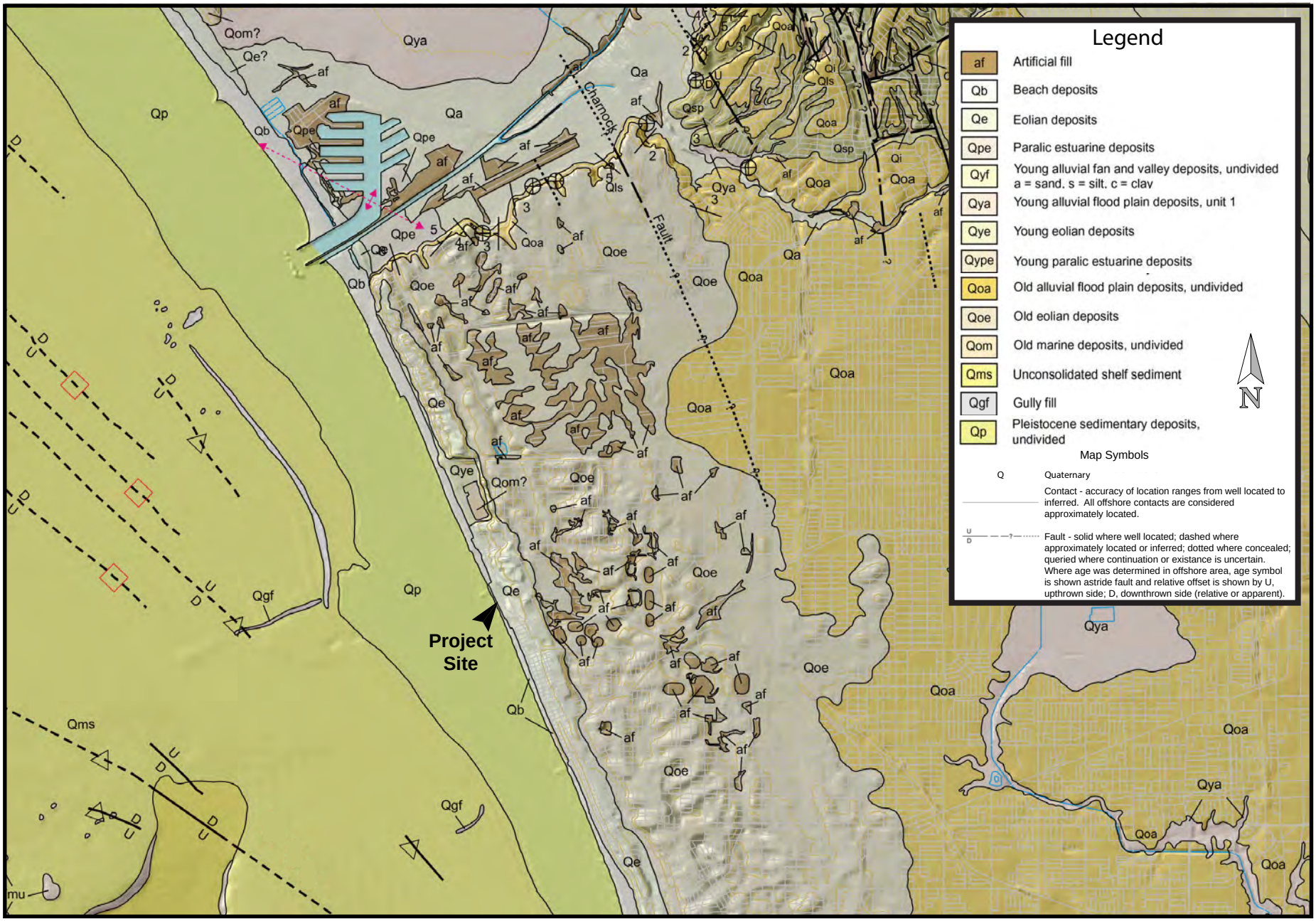
GEOLOGY AND PALEONTOLOGY

CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCE: Urban Development of Oil Fields in the Los Angeles Basin Area, 1983 to 2001 (Gamache 2003)

GEOLOGY AND PALEONTOLOGY - FIGURE 5

El Segundo Energy Center Amedment (ESEC) - Regional Geology



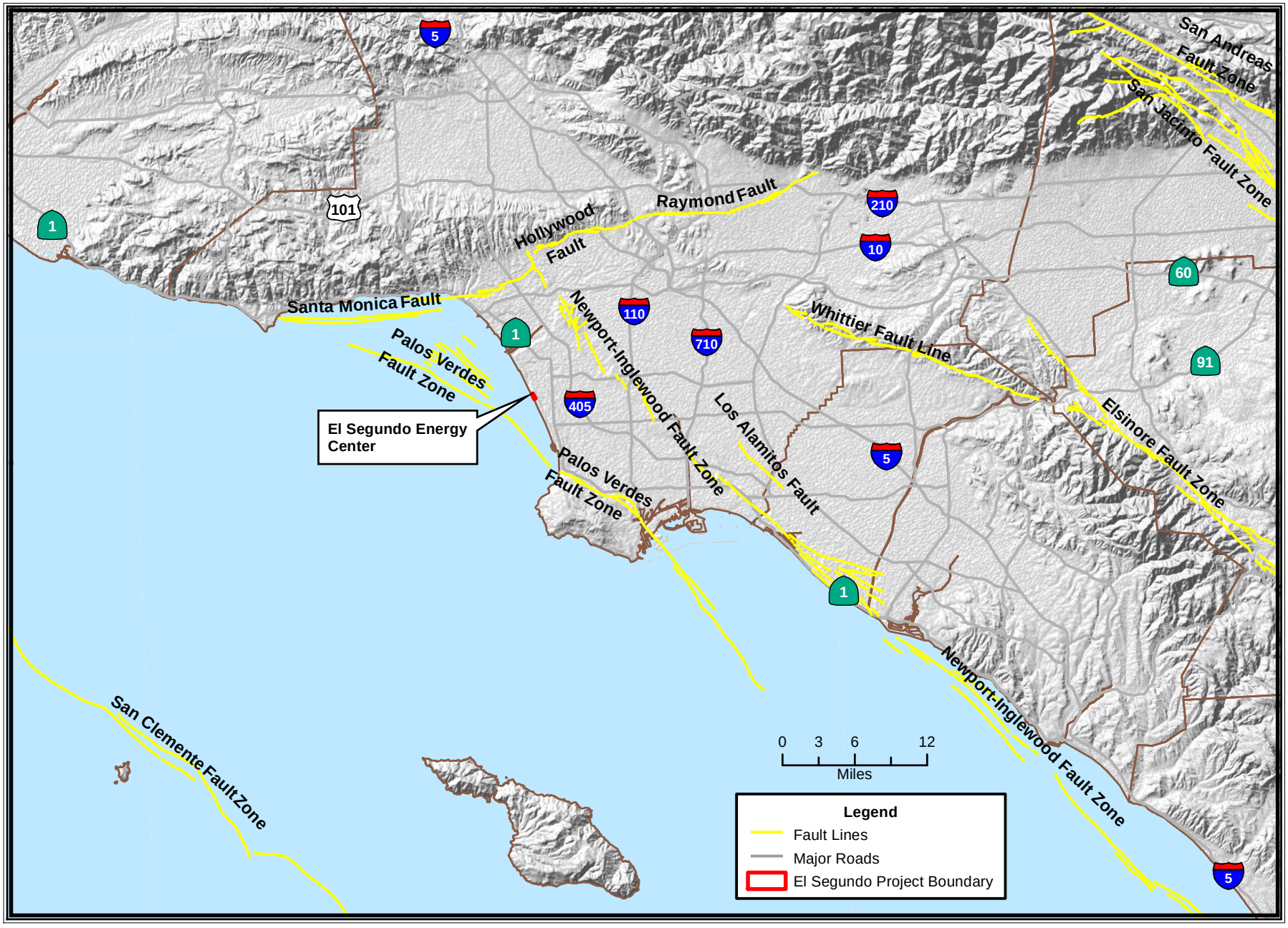
GEOLOGY AND PALEONTOLOGY

CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCE: Dept. of Conservation 2003 Preliminary Geologic Map of the Long Beach 30' x 60' Quadrangle, Southern California

GEOLOGY AND PALEONTOLOGY- FIGURE 6

El Segundo Energy Center - Fault Locations



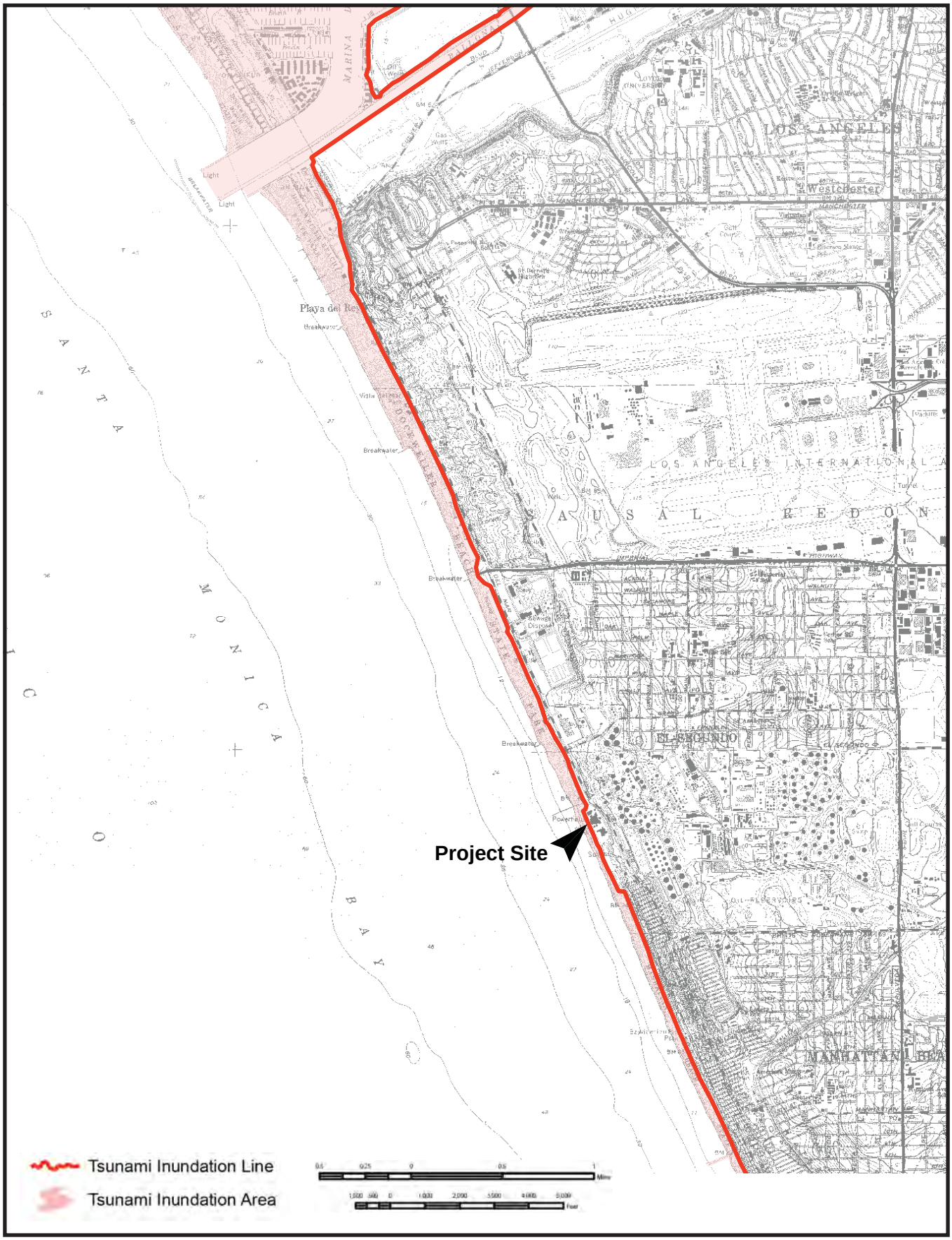
GEOLOGY AND PALEONTOLOGY

CALIFORNIA ENERGY COMMISSION, SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCE: Source: Dept of Conservation, California Geological Survey Seismic Hazard Assessment & Geologic Mapping Programs

GEOLOGY AND PALEONTOLOGY - FIGURE 7

El Segundo Energy Center Amendment (ESEC) - Tsunami Inundation



CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCE: State of California, 2009 Tsunami Inundation Map for Emergency Planning, County of Los Angeles, Venice Quadrangle, Dated March 1

POWER PLANT EFFICIENCY

Testimony of Edward Brady

SUMMARY OF CONCLUSIONS

At average project site climatic conditions, the combined cycle Units 9 and 10 would provide 295 megawatts (MW) gross at 53.4 percent efficiency lower heating value (LHV) and the simple cycle Units 11 and 12 would individually provide 58 MW gross of electricity at an overall project fuel efficiency of 42.2 percent LHV, for a total of 411 MW gross. (This site-specific total gross rating is different than that provided in the Petition to Amend, or 449 MW gross [NRG 2013a, Table 1-2A]; the 449 MW figure is a nominal number independent of the average site-specific climatic conditions of 77.8°F and 49.6 percent relative humidity [NRG 2013a, Figure 2-4].) While the project would consume substantial amounts of energy, it would do so in the most efficient manner practicable. It would not create significant adverse effects on energy supplies or resources, would not require additional sources of energy supply, and would not consume energy in a wasteful or inefficient manner. No energy standards apply to this project. Staff therefore concludes that this project would create no significant adverse impacts on energy resources.

No cumulative impacts on energy resources are likely. Facility closure would not likely present significant impacts on electric system efficiency.

INTRODUCTION

One of the responsibilities of the California Energy Commission (Energy Commission) is to make findings on whether the energy use by a power plant, including the proposed Petition to Amend (PTA), would 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 energy consumption creates a significant adverse impact, it must further determine if feasible mitigation measures could eliminate or minimize that impact. In this analysis, staff addresses the inefficient and unnecessary consumption of energy.

In order to determine the Energy Commission's findings, this analysis examines:

- whether the facility would likely present any adverse impacts upon energy resources; and if so,
- whether these adverse impacts are significant; and if so,
- whether feasible mitigation measures could eliminate those adverse impacts or reduce them to a level of insignificance.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

No federal, state, or local/county laws, ordinances, regulations, and standards (LORS) apply to the efficiency of this project.

SETTING

On April 23, 2013, El Segundo Energy Center, L.L.C. (ESEC, LLC) filed the El Segundo Power Facility Modification (ESPFM) PTA with the Energy Commission. This PTA requests to replace the existing older and less energy efficient utility boilers, or Units 3 and 4, at the El Segundo Energy Center (ESEC) with one new and more efficient combined cycle train consisting of one natural gas combustion turbine generator (CTG), one heat recovery steam generator (HRSG) and one steam turbine generator (STG), and two new, more efficient simple cycle CTGs. The PTA also proposes the replacement of a once-through seawater cooling system with dry-cooling technology. The new combined cycle is designated Unit 9 for the CTG and Unit 10 for the HRSG and STG. The two simple cycle gas turbines are designated Units 11 and 12. Under this PTA, the combined capacity of the new power complex is sized to replace and allow the decommissioning of four existing steam boilers (Units 3 and 4).

The combined cycle train is designed for quick start intermediate duty and the two simple cycle gas turbines are designed for peaker duty. The combined cycle train would use a rapid start technology capable of reaching 70 percent capacity (207 MW) in 10 minutes and an air-cooled condenser designed to eliminate once-through cooling currently in use by the existing Units 3 and 4. The project owner proposes a GE Frame 7FA natural gas combined cycle train, incorporating a 7FA.05 CTG with a dual pressure HRSG. The two natural gas simple cycle peakers would be Rolls Royce Trent 60 DLE ISI[44] aero-derivative CTGs.

Natural gas fuel would be provided from the existing gas service, delivering 450 psig (pounds per square inch gauge) natural gas to Unit 9 and 850 psig natural gas to Units 11 and 12. The natural gas would be used to fuel the three combustion turbines, and the duct heater and auxiliary boiler serving the combined cycle train. Heat from the steam turbine generator would be rejected through the dry air cooler, or air-cooled condenser.

ASSESSMENT OF IMPACTS

METHOD AND THRESHOLD FOR DETERMINING THE SIGNIFICANCE OF ENERGY RESOURCES

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" (California Code of Regulations, Title 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 the wasteful, inefficient, and unnecessary consumption of energy (CCR, Title 14, §15000 et seq., Appendix F).

[44] DLE: Dry Low Emissions. ISI: Inlet Spray Intercooling (NRG 2013a, §2.2.1).

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 (50 MW or greater) will, by definition, consume large amounts of energy. Under normal conditions the new Units 9-12 , or ESPFM, would burn natural gas at a maximum rate of approximately 2,939 million British thermal units (mmBtu) per hour at LHV, during peak load operation (NRG 2013a, Tables 2-2 and 2-3). This is a substantial rate of energy consumption that could potentially impact energy supplies. However, because the new combined cycle Units 9 and 10 and the two simple cycle Units 11 and 12 would be more efficient than the gas-fired generation systems they replace, this is a reduction in the project's required natural gas quantities.

The natural gas required for the combined cycle and simple cycle trains would be provided from the existing metering station currently feeding the project (NRG 2013a, §2.2.5), filtered and compressed to 450 psig for the GE Frame 7FA gas turbine and 850 psig each for Units 11 and 12. In addition to the three CTGs, natural gas would be heated from 245^{o}F to 365^{o}F in the HRSG duct heater, acting as a medium for the economizer bleed. The auxiliary boiler would be used to pre-heat the fuel gas until the economizer bleed operating temperature is reached. According to the project owner, no changes would be required to the existing ESEC natural gas supply pipelines furnished by Southern California Gas Company (SoCalGas), given the existing boilers of Units 3 and 4 are less efficient than the proposed Units 9 through 12. Thus, the existing pipeline would be adequate to provide the needed quantities of fuel for the facility incorporating the proposed units.

ADVERSE EFFECTS ON ENERGY SUPPLIES AND RESOURCES

The project owner has described its source of natural gas to operate the project (NRG 2013a, § 2.2.5). The existing natural gas pipeline to the ESEC is provided by SoCalGas. The SoCalGas natural gas pipeline system appears to be suited to supply natural gas to the project. The SoCalGas system draws from extensive supplies originating in the Southwest and in Canada, and is capable of delivering the gas that the project would require to operate. This natural gas supply is a reliable source of natural gas for the project. It is therefore unlikely that the project would create a substantial adverse impact on natural gas supplies.

ADDITIONAL ENERGY SUPPLY REQUIREMENTS

Natural gas fuel would be supplied to the project by SoCalGas from the existing natural gas metering station (NRG 2013a, § 2.2.5). Units 9-12 are principally designed to replace the power currently generated by Units 3-4, similar to the replacement scheme

where Units 1 and 2 were replaced by Units 5 through 7 in the original ESEC project. The combined fuel demand for the original Units 1 through 4 provides 1,020 MW net (NRG 2013a, § 2.1, Table 1-2A). The fuel demand for the ESPFM would be enough to generate a total of 995 MW net, slightly less than the original plant capacity of 1,020 MW, resulting in a slight reduction in fuel consumption. This amount of fuel would be further reduced due to the new, more efficient machines (CTGs and STGs) proposed in the PTA, as compared to the older utility boilers referred to as Units 1-4. Thus, no additional energy supplies would be required.

COMPLIANCE WITH ENERGY STANDARDS

No standards apply to the efficiency of the ESEC 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 were available that could reduce the project's fuel use. The evaluation of alternatives to the project (that could reduce wasteful, inefficient, or unnecessary energy consumption) first requires the examination of the project's energy consumption. Project fuel efficiency, and therefore its rate of energy consumption, is determined by both the configuration of the power producing system and the selection of equipment used to generate its power. As discussed above, the replacement of Units 3-4 with Units 9-12 exercises a transition to new equipment with higher efficiency.

Project Configuration

The plant would employ one General Electric Frame 7FA CTG (combustion turbine generator) which would consume natural gas, one dual pressure HRSG (heat recovery steam generator) equipped with duct burners[45], and one condensing STG (steam turbine generator) in a one-on-one combined cycle configuration (NRG 2013a, § 2.2.1). Electricity would be generated by the gas turbine and by the steam turbine operating on heat energy recovered from the gas turbine's exhaust. By recovering this heat, which would otherwise be lost up the exhaust stack, the efficiency of any combined cycle power plant is increased from that of either a gas turbine or a steam turbine operating alone. This configuration is well suited to the large, steady loads met by a base load plant that generates energy efficiently over long periods of time.

The project owner proposes to use a rapid response technology in order to use the combined cycle in a fast start mode having the ability to reach 75 percent capacity in ten minutes and 100 percent capacity in 85 minutes (NRG 2013a, § 2.2.7). This assumes that the STG would be capable of reaching full capacity in 45 minutes from hot start condition, 85 minutes in warm start condition, and 125 minutes from cold standby condition. An auxiliary steam boiler would provide steam to reach economizer temperatures more quickly. The ESPFM is designed to produce intermediate and peak electricity and ancillary load-following services. These capabilities would allow the project to provide more operating flexibility than a conventional combine cycle plant

[45] duct burners would also consume natural gas

(one that would operate primarily in base load mode due to the lack of this rapid response capability).

As a complement to the rapid response combined cycle configuration, the project owner proposes to employ two Rolls Royce Trent 60 CTGs as peakers, providing a simple cycle system suitable for use in a load balancing dispatch mode. Each Trent 60 would utilize inlet spray injection to boost efficiency. The spray injection allows further cooling of pressurized air prior to entering the combustion chamber, which translates to more electricity produced for the same amount of fuel.

Equipment Selection

Because site-specific design conditions are not available for comparable power generating systems (i.e.; CTGs), the International Standards Organization (ISO)[46] design conditions are used below for comparison to similarly configured systems.

Combined Cycle Duty – Units 9-10

The F-class advanced gas turbine proposed for installation in this project represents one of the most modern and efficient machines available. The project owner would install one GE Frame 7FA combustion gas turbine generator in a one-on-one combined cycle power train nominally rated at 323 MW and 58.2 percent net plant efficiency LHV under ISO conditions[47].

One possible alternative is the Siemens (formerly Westinghouse) SCC6-5000F, nominally rated in a one-on-one train combined cycle configuration at 307 MW and 57.0 percent efficiency LHV at ISO conditions (2013 GTW Handbook, p. 35).

Another alternative is the Mitsubishi Heavy Industries (MHI) MPCP1 (M501F), nominally rated in a one-on-one configuration at 285.1 MW with an efficiency rating of 57.1 percent LHV at ISO conditions (2013 GTW Handbook, p. 33).

See **Efficiency Table 1** below.

Efficiency Table 1 – Combined Cycle Comparison at ISO Conditions

Description	ISO Rated Net Output[48] (MW)	Efficiency (LHV)
GE 7FA	323.0	58.2 percent
Siemens SCC6-5000F	307.0	57.0 percent
MHI MPCP1(M501G)	285.1	57.1 percent

[46] ISO design conditions are 15°C (59°F), 60 percent relative humidity, and one atmosphere of pressure (equivalent to sea level).

[47] Source of ISO ratings: 2013 Gas Turbine World (GTW) Specs, pp. 20 and 31.

[48] ISO rated MW values are used here because site-specific values are not available for the comparable systems, such as the Siemens and MHI machines. The 323 MW rating used here for the GE 7FA combined cycle train, thus, does not reflect the site-specific climatic conditions that result in 295 MW used elsewhere in this section for this train.

Any differences among the SCC6-5000F, the MHI M501F, and the GE 7FA in actual operating efficiency would be insignificant. Selecting among these machines is thus based on other factors such as generating capacity, cost, commercial availability and experience, and the control technology to bring the combined cycle system to full power as quickly as possible. Due to GE Frame 7F's extensive commercial experience, staff believes the project owner's selection of the GE's gas turbine is reasonable.

Simple Cycle Duty – Units 11 and 12

The project owner also proposes to employ two Rolls Royce Trent 60 CTGs for simple cycle peaker duty, designated Units 11and 12. These aero-derivative units were designed for flexibility and capable of handling the stress of multiple starts and stops. Alternative machines to the Rolls Royce Trent 60 are the M6000PD SPRINT, the SGT-800, and the SwiftPac 60, which are aero-derivative machines adapted from General Electric, Siemens Power Generation, and Pratt & Whitney aircraft engines, respectively.

The Siemens SGT-800 gas turbine generator in a simple cycle configuration is nominally rated at 50.5 MW and 38.3 percent efficiency LHV at ISO conditions (2013 GTW, p. 20). The GE LM6000PD SPRINT gas turbine generator in a simple cycle configuration is nominally rated at 47.5 MW and 41.8 percent efficiency LHV at ISO conditions (2013 GTW, p. 14). The Pratt & Whitney SwiftPac 60 gas turbine generator in a simple cycle configuration is nominally rated at 62.0 MW and 37.0 percent efficiency LHV at ISO conditions (2013 GTW Handbook, p. 20). See **Efficiency Table 2** below.

Efficiency Table 2 – Simple Cycle Comparison at ISO Conditions

Description	ISO Rated Net Output[49] (MW)	Efficiency (LHV)
Rolls Royce Trent 60 DLE ISI	61.8	43.4 percent
Siemens SGT-800	50.5	38.3 percent
GE LM6000PD Sprint	47.5	41.8 percent
P&W SwiftPac 60	62.0	37.0 percent

Any differences among these machines in actual operating efficiency would be insignificant. Due to the Trent 60's extensive commercial experience, staff believes the project owner's selection of this gas turbine is reasonable.

Efficiency of Alternatives to the Project

The project's objectives include the efficient generation of electricity to help meet the future electrical power needs (NRG 2013a, § 2.1).

Alternative Generating Technologies

Alternative generating technologies for the ESPFM are considered in the PTA (NRG 2013a, § 2.1). For purposes of this analysis, fossil fuels, hydroelectric, solar, wind, and geothermal technologies are all considered.

[49] ISO rated MW values are used here because site-specific values are not available for the comparable systems, such as the Siemens and P&W machines. The 61.8 MW rating used here for the Trent 60 machine, thus, does not reflect the site-specific climatic conditions that result in 58 MW used elsewhere in this section for this machine.

The project owner has selected the mix of natural gas combined cycle and natural gas simple cycle components utilizing fast start and dispatch flexibility in order to support southern California grid load balancing and renewable energy integration (NRG 2013a, § 1.1). This project would provide an important element in the introduction of renewable energy sources by providing a bridge for power-loss intermittencies characteristic of wind turbines, solar photovoltaic, and solar thermal electric generation systems. Given the project objectives, location, and the commercial experience of the selected technologies, staff agrees with the project owner that only natural gas-burning technologies are feasible for this project.

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 fuel-fired power plant. 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 strongly motivated to purchase fuel-efficient machinery.

A modern intermediate load combined cycle power plant (Units 9 and 10) would offer a balance between high efficiency and start-up flexibility and complements the simple cycle peaker systems (Units 11and 12), providing a highly adaptable power package.

The Rolls Royce Trent 60 aero-derivative CTGs would provide very fast response to power grid dispatch, while the GE 7FA and the simplified dual pressure HRSG design would provide additional power demand response by providing cold to hot start-up capability in a large industrial-duty system.

A possible alternative to the F-class CTG selected for the ESPFM is to employ the larger industrial-duty next generation G-class (e.g., Siemens-Westinghouse 501G) which would use partial steam cooling to allow slightly higher temperatures, yielding proportionately greater efficiency. Due to the project's need for operational flexibility, in actual operation, one would expect to see the difference in efficiency diminish, since larger-capacity G-class turbines would run at less than optimum (full) output more frequently than smaller-capacity F-class turbines. (Gas turbine efficiency drops rapidly at less than full load.) Given the minor efficiency improvement promised by the G-class turbine, and since this machine would have to operate at less than optimum base load efficiency in order to meet the project load capacity requirements, staff believes the project owner's decision to purchase the 7FA series machines is reasonable.

Another possible alternative to the 7FA class advanced gas turbine is an H-class next generation machine with a claimed fuel efficiency of 60 percent LHV and 400 MW nominal output at ISO conditions. This high efficiency is achieved through a higher pressure ratio and firing temperature, made possible by cooling the initial turbine stages with steam instead of air. The first Frame 7H machine has only recently completed commissioning at the Inland Empire Energy Center in Riverside County, California. Given the lack of commercial experience with this machine and the project load requirements, staff agrees with the project owner's decision to use the smaller, more flexible 7FA model.

As an alternative to the ESPFM, retrofitting existing Units 3 and 4 of the ESEC while maintaining the existing boilers would not provide the operating flexibility and efficiency improvement offered by the 7FA combined cycle and Trent 60 simple cycle trains in a hybrid configuration.

Inlet Air Cooling

Other alternatives include gas turbine inlet air cooling methods. The two most common techniques are evaporative coolers or foggers, and chillers. Both increase power output by cooling gas turbine inlet air. A mechanical chiller offers greater power output than the evaporative cooler on hot, humid days. However, it consumes electric power to operate its refrigeration process, slightly reducing its overall net power output and overall efficiency. An absorption chiller uses less electricity but is less reliable than its electric-driven counterpart. An evaporative cooler or fogger boosts power output most efficiently on dry days; it uses less electricity than a mechanical chiller, possibly producing a slightly higher operating efficiency. Efficiency differences between these alternatives are relatively insignificant.

Given the climate at the project site and the relative lack of clear superiority of one system over another, staff agrees that the project owner's choice of an evaporative gas turbine inlet air cooling system (NRG 2013a, § 2.3) would have no significant adverse energy impacts.

Alternative Heat Rejection System

The project owner proposes to employ a dry cooling system (air-cooled condensers) as the means for rejecting power cycle heat from the steam turbine. An alternative heat rejection system would utilize a wet cooling system (a cooling tower).

The local climate in the project area is characterized by relatively moderate coastal temperatures and variable relative humidity. In low temperature and high relative humidity, the air-cooled condenser performs slightly better than the evaporative cooling tower. In high temperatures and low relative humidity, the evaporative cooling tower performs marginally better than the air-cooled condenser. However, due to the restriction of using existing water supplies, the project owner has chosen to use dry cooling. This is acceptable to staff, given that only a slight efficiency improvement would be provided by the wet cooling alternative in such a mild coastal environment.

Staff concludes that the selected project configuration (rapid response combined cycle) and generating equipment (7FA.05 and Rolls Royce Trent 60 gas turbines and associated cooling systems) represent the most efficient feasible combination for satisfying the project's objectives. The one-on-one CTG/HRSG/STG configuration allows for baseline flexibility during unit operation, sequencing Units 11 and 12 upon dispatch command. This offers a flexibility advantage over the larger machines during unit turn-down or turn-up.

Beyond those discussed above, there are no alternatives that would significantly reduce energy consumption while satisfying the project's objectives of producing intermediate and peak electricity and ancillary load-following services.

Staff, therefore, concludes that the project would not create a significant adverse impact on energy resources.

CUMULATIVE IMPACTS

No nearby projects have been identified that could potentially combine with the ESPFM project to create cumulative impacts on fuel resources. The SoCalGas natural gas supply system is adequate to supply the ESPFM project without adversely impacting its other customers. See the section of this document entitled **Power Plant Reliability** for further discussion of this subject.

NOTEWORTHY PUBLIC BENEFITS

The project owner expects to increase power supply reliability in the California electricity market by meeting both the state's energy needs and contributing to regional electricity reserves. By doing so in a fuel-efficient manner, a combined cycle system that optimizes quick response capabilities provides system simplicity, efficiency and flexibility, and complements the peaker turbines proposed in the PTA. By replacing the existing power generation units, which are old and relatively inefficient, and by providing a bridge for power-loss intermittencies characteristic of wind turbines, solar photovoltaic, and solar thermal electric generation systems, the ESPFM would benefit California's electricity consumers.

RESPONSE TO AGENCY AND PUBLIC COMMENTS

Staff has not received any public or agency comments in the area of Power Plant Efficiency.

CONCLUSIONS AND RECOMMENDATIONS

At average project site climatic conditions, the combined cycle train would provide 295 MW gross at 53.4 percent efficiency LHV and the simple cycle Units 11 and 12 would individually provide 58 MW gross of electricity at an overall project fuel efficiency of 42.2 percent LHV, for a total of 411 MW gross[50]. While the project would consume substantial amounts of energy, it would do so in the most efficient manner practicable (see discussion in **PROJECT ENERGY REQUIREMENTS AND ENERGY USE EFFICIENCY**, above). It would not create significant adverse effects on energy supplies or resources, would not require additional sources of energy supply, and would not consume energy in a wasteful or inefficient manner. No energy standards apply to this project. Staff therefore concludes that this project would create no significant adverse impacts on energy resources.

[50] This site specific total gross rating is different than that provided in the PTA, or 449 MW gross (NRG 2013a, Table 1-2A); the 449 MW figure is a nominal number independent of the average site-specific climatic conditions of 77.8^0F and 49.6 percent relative humidity (NRG 2013a, Figure 2-4)

No cumulative impacts on energy resources are likely. Facility closure would not likely present significant impacts on electric system efficiency.

PROPOSED CONDITIONS OF CERTIFICATION

No conditions of certification are proposed.

REFERENCES

GTW 2013 — Gas Turbine World 2013 performance specs, 30th Edition.

NRG 2013a — NRG/El Segundo Energy Center, L.L.C. (tn: 70442). Petition to Amend, dated April, 2013, submitted to the California Energy Commission on April 23, 2013.

POWER PLANT RELIABILITY

Testimony of Edward Brady

SUMMARY OF CONCLUSIONS

The project owner's commitment to capacity factors of 60 percent for the natural gas combined cycle train designated Units 9 and 10 and 55 percent for the natural gas simple cycle units designated Units 11 and 12, respectively (NRG 2013a, § 2.2.6), yield derived equivalent availability factors, or EAFs[1] of 94 percent for Units 9-10 and 89 percent for Units 11-12. Staff believes these availabilities are achievable. Based on a review of the Petition to Amend (PTA), staff concludes that the final phase of the El Segundo Energy Center (ESEC) designated as the El Segundo Power Facility Modification (ESPFM) would be built and would operate in a manner consistent with industry norms for reliable operation.

INTRODUCTION

In this analysis, California Energy Commission (Energy Commission) staff addresses the reliability issues of the ESPFM to determine if it is likely to be built in accordance with typical industry norms for reliable power generation. Staff uses these norms as a benchmark because they ensure that the resulting project would not be likely to degrade the overall reliability of the electric system it serves (see the "Setting" subsection, below).

The scope of this power plant reliability analysis covers these benchmarks:

- equipment availability and plant maintainability;
- fuel and water availability; and,
- power plant reliability in relation to natural hazards.

The PTA proposes the demolition of Units 3 and 4, to be replaced with Units 9, 10, 11, and 12, and the replacement of a once-through seawater cooling system with dry-cooling technology. Units 9-12 are principally designed to replace the power currently generated by Units 3-4, similar to the replacement scheme when Units 1 and 2 were replaced by Units 5 through 7 in the original ESEC project (see the Energy Commission Decision, CEC 2005a).

Staff has examined the project design criteria to determine if the project is likely to be built in accordance with typical industry norms for reliable power generation. While the project owner did not provide an equivalent availability factor (EAF) in its PTA, staff derived EAFs for the three distinct systems (Units 9-10, Unit 11, and Unit 12) included in the ESPFM project, which staff has used as industry benchmarks in order to evaluate the project's reliability.

[1] Equivalent availability factor, or EAF, is the percentage of time a unit is available for dispatch, and reflects the probability of planned and forced (unplanned) outages.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

No federal, state, or local/county laws, ordinances, regulations, or standards (LORS) apply to the reliability of this project.

SETTING

In the restructured competitive electric power industry, the responsibility for maintaining system reliability falls largely to the state's control area operators, such as the California Independent System Operator (California ISO), which purchase, dispatch, and sell electricity throughout the state. How the California ISO and other control area operators ensure system reliability is an evolving process; new protocols are being developed and put in place to ensure sufficient reliability in the competitive market system. "Must-run" power purchase agreements and "participating generator" agreements are two mechanisms that ensure an adequate supply of reliable power.

The California ISO also requires that power plants selling ancillary services, as well as those holding reliability must-run contracts, fulfill certain requirements, including:

- filing periodic reports on plant reliability;
- reporting all outages and their causes; and
- scheduling all planned maintenance outages with the California ISO.

The California ISO's mechanisms to ensure adequate power plant reliability have apparently been developed with the assumption that individual power plants competing to sell power into the system will exhibit reliability levels similar to those of power plants of past decades. However, there is reason to believe that, with free market competition, financial pressures on power plant owners to minimize their capital outlays and maintenance expenditures may ultimately reduce the reliability of many existing and newly constructed power plants. Until the state's restructured competitive electricity market has undergone a shakeout period and the effects of varying power plant reliability are thoroughly understood and compensated for, staff recommends that power plant owners continue to build and operate their projects to the industry's current level of reliability.

The nominal gross output for the system provided under the ESPFM is 449 megawatts (MW), 334 MW from Units 9-10 and 57.4 MW each from Units 11 and 12 (NRG 2013a, Table 1-2A). The ability of this project to start up, shut down, turn down, and provide load following, when needed, would allow the system operator to adapt the plant's output to changing conditions in the energy and ancillary services markets (NRG 2013a, §§ 3.1.4.2, 4.1.4.3, 3.1.4.4).

ASSESSMENT OF IMPACTS

METHOD FOR DETERMINING RELIABILITY

The Energy Commission must make findings as to how the project is designed, sited, and operated in order to ensure its safe and reliable operation (Title 20, California Code of Regulations § 1752[c]). Staff will conclude that a project is acceptable if it does not degrade the reliability of the utility system to which it is connected. This will be the case if a project is at least as reliable as other power plants on that system.

The equivalent availability factor, or EAF, of a power plant is the percentage of time it is available to generate power; both planned and unplanned outages subtract from this availability. Measures of power plant reliability are based upon both the plant's actual ability to generate power when it is considered to be available, and upon starting failures and unplanned (or forced) outages. For practical purposes, reliability can be considered a combination of these two industry measures, making a reliable power plant one that is available when called upon to operate. Power plant systems must be able to operate for extended periods without shutting down for maintenance or repairs. Achieving this reliability requires adequate levels of equipment availability, plant maintainability with scheduled maintenance outages, fuel and water availability, and resistance to natural hazards. Staff examines these factors for a project and compares them to industry norms. If they compare favorably for this project, staff will then conclude that the project will be as reliable as other power plants on the electric system and will not degrade system reliability.

Note that the term "availability factor, or AF" used in this analysis is different than the term "equivalent availability factor, or EAF", in that, AF does not account for forced outages. AF is the percentage of time the power plant is available to generate power; with only planned outages subtract from this availability.

EQUIPMENT AVAILABILITY

Equipment availability would be ensured by adopting appropriate quality assurance and quality control programs during the design, procurement, construction, and operation of the plant and by providing for the adequate maintenance and repair of the equipment and systems discussed below.

Quality Control Program

Similar to the original ESEC project, staff expects that equipment will be purchased from qualified suppliers based on technical and commercial evaluations; and suppliers' personnel, production capability, past performance, quality assurance (design, manufacturing and procurement) and quality control (receipt inspection, handling, storage, installation, start-up and performance testing) programs. Also similar to the original ESEC project, staff expects the project owner to perform receipt inspections, test components, and administer independent testing contracts. Staff believes that implementation of this program would result in standard reliability of design and construction. To ensure this implementation, staff has proposed appropriate conditions of certification in the section of this document entitled **Facility Design**.

PLANT MAINTAINABILITY

Equipment Redundancy

A generating facility must be capable of being maintained while operating. A typical approach to this is to provide redundant examples of those pieces of equipment that are most likely to require service or repair.

The project owner plans to provide an appropriate redundancy of function for the project (NRG 2013a, § 2.9.1). Because the project consists of three independent equipment trains, it is inherently reliable. A single equipment failure cannot disable more than one train, which allows the plant to continue to generate, but at reduced output. Plant ancillary systems are also designed with adequate redundancy to ensure their continued operation if equipment fails. Staff believes that this project's proposed equipment redundancy would be sufficient for its reliable operation.

Maintenance Program

Equipment manufacturers provide maintenance recommendations for their products, and the project owner would base the project's maintenance program on those recommendations. The program would encompass both preventive and predictive maintenance techniques. Maintenance outages would probably be planned for periods of low electricity demand. Staff expects that the project would be adequately maintained to ensure an acceptable level of reliability.

FUEL AND WATER AVAILABILITY

The long-term availability of fuel and of water for cooling or process use is necessary to ensure the reliability of any power plant. The need for reliable sources of fuel and water is obvious; lacking long-term availability of either source, the service life of the plant could be curtailed, threatening both the power supply and the economic viability of the plant.

Fuel Availability

Natural gas fuel would be supplied to the project by Southern California Gas Company (SoCalGas) from the existing natural gas metering station currently feeding the project (NRG 2013a, § 2.2.5). Units 9-12 are principally designed to replace the power currently generated by Units 3-4, similar to the replacement scheme where Units 1 and 2 were replaced by Units 5 through 7 in the original ESEC project (CEC 2005a). The combined fuel demand for the original Units 1 through 4 provided 1,020 MW net of electric power (NRG 2013a, § 2.1). The fuel demand for the ESPFM would be enough to generate a total of 995 MW net, slightly less than the original plant capacity of 1,020 MW, resulting in a slight reduction in fuel consumption. This amount of fuel would be further reduced due to the new, more efficient electric generating equipment (combustion turbine generators and steam turbine generator) proposed in the PTA, as compared to the older utility boilers of Units 1-4. Thus, no additional quantities of fuel would be required.

SoCalGas's natural gas system represents a resource of considerable capacity and offers access to adequate supplies of gas. Staff concludes that there would be adequate natural gas supply and pipeline capacity to meet the project's needs.

Water Supply Reliability

The project owner proposes to consolidate the source of the plant's annual water consumption by shifting the bulk of the requirement from the cities of El Segundo and Manhattan Beach (Metropolitan Water District of Southern California, or MWD) to the West Basin Municipal Water District (WBMWD) requiring less than one acre feet per year (afy) from the former (0.72 from MWD) and increasing usage from an average of 112 to 119 afy from the latter (from WBMWD). The completion of this phase of improvements at the ESEC site would mark the elimination of seawater cooling (NRG 2013a, Table 2-7) following the decommissioning and demolition of Units 3 and 4.

The GE 7FA.05 combustion turbine generator used in the combined cycle system and the Rolls Royce Trent 60 combustion turbine generators used in the simple cycles would use water at the same rate for air intake evaporative cooling and intermediate water injection at rates similar to other manufacturers.

The project owner proposes to use the existing potable water service to the site (NRG 2013a, § 2.3, Table 2-9, p. 2-12) via a new 10-inch water line for reclaim water and an existing 6-inch water line for irrigation.

Therefore, staff believes the source of water supply represents a reliable source for the project. For further discussion of water supply, see the **Soil and Water Resources** section of this document.

POWER PLANT RELIABILITY IN RELATION TO NATURAL HAZARDS

Natural forces can threaten the reliable operation of a power plant. Seismic shaking (earthquakes), flooding, and tsunami could present credible threats to the project's reliable operation.

Seismic Shaking

The site lies within a seismically active area (NRG 2013a, §§ 2.1.4, 3.4). For further discussion of seismicity, see the **Geology and Paleontology** section of this document. The project would be designed and constructed to the latest appropriate LORS (NRG 2013a, §§ 1.10, 3.4.5). Compliance with current seismic design LORS represents an upgrading of performance during seismic shaking compared to older facilities since these LORS have been continually upgraded. Because it would be built to the latest seismic design LORS, this project would 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 the section of this document entitled **Facility Design**. In light of the general historical performance of California power plants and the electrical system in seismic events, staff has no special concerns with the power plant's functional reliability during seismic events.

Flooding, Storm Surge and Wave Run-up

The project site is located in a Federal Emergency Management Area (FEMA) Zone X, which indicates the site is at an elevation above the 100-year floodplain. Ocean storm surges are considered in the FEMA floodplain. See **Soil and Water Resources** section of this document. A drainage, erosion and sediment control plan would be implemented (see **Facility Design**).

In light of this, staff believes there are no special concerns with power plant functional reliability due to flooding, storm surge or wave run-up.

Tsunami and Seiche

The proposed site is not within the zone identified by California Emergency Management Agency (CEMA) as a tsunami inundation zone; see **Soil and Water Resources** and **Geology and Paleontology** sections of this document. While not likely to occur during the project life, the site is subject to inundation by tsunami. U.S. Building codes generally have not addressed the subject of designing structures in tsunami zones.

FEMA's Coastal Construction Manual (FEMA 55), developed to provide design and construction guidance for structures built in coastal areas, addresses seismic loads for coastal structures and provides information on tsunami and associated loads. FEMA 55 cites American Society of Civil Engineers Standard ASCE 7-10, "Minimum Design Loads for Buildings and Other Structures" as the reference to be consulted during design of structures. ASCE 7-10 is codified in 2013 California Building Code. Project would be designed and constructed to this code (see **Facility Design**).

For further discussion, also see **Soil and Water Resources** and **Geology and Paleontology**.

COMPARISON WITH EXISTING FACILITIES

Industry statistics for AFs (availability factors) and EAFs (equivalent availability factors), as well as other related reliability data, are maintained by the North American Electric Reliability Corporation (NERC). NERC regularly polls North American utility companies on their project reliability through its Generating Availability Data System (GADS), and periodically summarizes and publishes those statistics on the Internet [http://www.nerc.com]. The NERC reported the following generating unit EAFs for the years 2007 through 2011: 87 percent for combined cycle plants and 91 percent for simple cycle plants (NERC 2012). See comparison of project EAFs with existing plants EAFs in **Reliability Table 1** below.

The project owner expects Units 9-10 to attain a capacity factor of 0.60 (NRG 2013a, § 2.2.6), which translates to an expected availability of 0.60 x 8,760 hours = 5,256 hours per year. Additionally, the start-up and shutdown of this system is expected to take 200 hours to start-up, leaving 5256 – 200 = 5056 full load operating hours (FLOH) per year (2013 PTA, § 3.1.4.4), and an availability factor (AF) of 5056/5256 = 0.96 or 96 percent. (Note that the 200 hours shutdown specified in the Petition to Amend is not included in the calculation, because it does not occur within the expected on-line operating window.

The AF predicts the *expected* availability, but does not account for *unexpected* outages. For these outage values, staff used statistical data taken from the current NERC GADS for a natural gas combined cycle unit[2], where the difference between the *expected* and total outage hours is the *unexpected* hours. These hours can be calculated using the statistical values for AF and EAF[3] from the NERC data: (AF – EAF) x FLOH = Unexpected Outages Hours. For Units 9-10, the unexpected outage hours would be (0.8909 - 0.8676) x 5056 = 118 hours. From the statistical difference, the EAF for Units 9-10 would be (5256 - 200 - 118)/5256 = 0.94 or 94 percent.

The same method of evaluation would be applied individually to Units 11 and 12. Based on the project owner's estimate of 55 percent capacity factor, the expected FLOH is 0.55 x 8760 = 4818 hours per year. For an expected 480 start-up hours, AF = (4818 – 480)/4818 = 0.90 or 90 percent. The unexpected outages hours based on GADS statistics for a natural gas simple cycle unit would be (0.9235 – 0.9086) x 4818 = 72 hours. So based on the GADS data[4], the EAF for Unit 11 or Unit 12 would be (4818 – 480 – 72)/4818 = 0.89 or 89 percent.

Reliability Table 1 – Availability Factors

System	EAF (ESPFM)	EAF (NERC Average)
Units 9-10	94 percent	87 percent
Units 11 and 12	89 percent	91 percent

The project's gas turbines have been on the market for several years and are expected to exhibit typically high availability. The derived EAFs (equivalent availability factors) from these estimates appear reasonable when compared with NERC figures based on similar plants throughout North America (see **Reliability Table 1** above). In fact, these machines can well be expected to outperform the fleet of various (mostly older and smaller) gas turbines that make up NERC statistics.

In addition, because the ESPFM would consist of three independent power trains, maintenance can be scheduled during times of the year when the full plant output is not required to meet market demand. The project owner's commitment on plant availability, therefore, appears to be realistic. Stated procedures for assuring the design, procurement, and construction of a reliable power plant appear to be consistent with industry norms. Staff concludes that they would ultimately produce an adequately reliable plant.

[2] North American Electrical Reliability Corporation (NERC) Generating Availability Data System (GADS) 2007-2011 Annual Unit Performance Statistics, Combined Cycle, All MW Sizes.

[3] Equivalent availability factor, or EAF, is the percentage of time a unit is available for dispatch, and reflects the probability of planned and forced (unplanned) outages.

[4] ibid, Gas Turbine, 50 Plus MW

NOTEWORTHY PROJECT BENEFITS

This project would enhance power supply reliability in the California electricity market by helping to meet the state's growing energy demand and providing operating flexibility (that is, the ability to start up, shut down, turn down, and provide load following, when needed). The fact that the ESPFM consists of three generator trains, configured as independent equipment trains, provides inherent reliability. A single equipment failure cannot disable more than one train, thereby allowing the plant to continue to generate, though at reduced output. Furthermore, the ESPFM would provide a bridge for power-loss intermittencies characteristic of wind turbines, solar photovoltaic, and solar thermal electric generation systems.

RESPONSE TO AGENCY AND PUBLIC COMMENTS

Staff has not received any public or agency comments in the area of Power Plant Reliability.

CONCLUSION

The project owner's predictions of 60 percent capacity factor for Units 9-10 and 55 percent for Units 11 and 12 yield equivalent availability factors of 94 percent and 89 percent, respectively, which staff believes are achievable. Based on a review of the proposal, staff concludes that the plant would be built and operated in a manner consistent with industry norms for reliable operation. No conditions of certification are proposed.

PROPOSED CONDITIONS OF CERTIFICATION

No conditions of certification are proposed.

REFERENCES

CEC 2005a — CEC (CEC-800-2005-001-CMF), El Segundo Power Redevelopment Project Commission Decision, dated February 2005.

NRG 2013a — NRG/El Segundo Energy Center, L.L.C. (tn: 70442). Petition to Amend, dated April, 2013, submitted to the California Energy Commission on April 23, 2013.

NERC (North American Electric Reliability Corporation) 2012 — 2007–2011 Generating Availability Report.

TRANSMISSION SYSTEM ENGINEERING

Testimony of Sudath Edirisuriya and Mark Hesters

SUMMARY OF CONCLUSION

The modifications of the El Segundo Energy Center LLC petition to amend (PTA), do not impact the previously approved 230kV plant switchyard, outlet lines, and termination facilities. The certified facilities are adequate and in accordance with industry standards and good utility practices and are acceptable to Staff according to engineering laws, ordinances, regulations and standards (LORS).

- The project modifications do not affect the net output of the power plant. Therefore, the existing 230kV plant switchyard and generator-tie lines are adequate and are rated to withstand the net output of the project.
- The Large Generator Interconnection Agreement (LGIA) for the generator replacement is being evaluated by the California Independent System Operator (California ISO). The LGIA will be amended if there are any changes are required.
- Staff believes previous planning study (System Impact Study) is applicable in this amendment due to unchanged net output of the modified project.

Staff concludes that these facilities will comply with LORS, assuming the Conditions of Certification **TSE-1** through **TSE-8** are met. The project owner 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 Power Facility Modification (ESPFM). Staff does not propose any changes to the existing conditions of certification.

INTRODUCTION

STAFF ANALYSIS

This Transmission System Engineering (TSE) analysis examines whether this project's proposed interconnection conforms to all LORS required for safe and reliable electric power transmission. Additionally, under the California Environmental Quality Act (CEQA), the California Energy Commission (Energy Commission) must conduct an environmental review of the "whole of the action," which may include facilities not licensed by the Energy Commission (California Code of Regulations, title 14, §15378). The Energy Commission must therefore identify the system impacts and necessary new or modified transmission facilities downstream of the proposed interconnection that are both required for interconnection and represent the "whole of the action."

Energy Commission staff relies upon the interconnecting authority, in this case the California ISO, for the analysis of impacts on the transmission grid from the proposed interconnection, as well as the identification and approval of new or modified facilities downstream that could be required for mitigation. The ESPFM would connect to the

Southern California Edison (SCE) transmission system and require both analysis by SCE and approval by the California ISO. No changes are proposed to the interconnection for this project.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS

- California Public Utilities Commission General Order 95 (CPUC GO-95), “Rules for Overhead Electric Line Construction,” formulates uniform requirements for construction of overhead lines. Compliance with this order ensures adequate service and safety to persons engaged in the construction, maintenance and operation or use of overhead electric lines and to the public in general.

- California Public Utilities Commission General Order 128 (CPUC GO-128), “Rules for Construction of Underground Electric Supply and Communications Systems”, formulates uniform requirements and minimum standards to be used for underground supply systems to ensure adequate service and safety to persons engaged in the construction, maintenance and operation or use of underground electric lines and to the public in general.

- The National Electric Safety Code, 2012, provides electrical, mechanical, civil and structural requirements for overhead electric line construction and operation.

- NERC/WECC Planning Standards: The North American Electric Reliability Council (NERC) Planning Standards are merged with the Western Electricity Coordinating Council (WECC) Planning Standards and provide the system performance standards used in assessing the reliability of the interconnected system. These standards require the continuity of service to loads as the first priority and preservation of interconnected operation as a secondary priority. Certain aspects of the NERC/WECC standards are either more stringent or more specific than the NERC standards alone. These standards provide planning for electric systems so as to withstand the more probable forced and maintenance outage system contingencies at projected customer demand and anticipated electricity transfer levels, while continuing to operate reliably within equipment and electric system thermal, voltage and stability limits. These standards include the reliability criteria for system adequacy and security, system modeling data requirements, system protection and control, and system restoration. Analysis of the WECC system is based to a large degree on NERC Standards TPL-001 through TPL-004 of the standards and “Table I. Transmission System Standards-Normal and Emergency Conditions” and WECC Disturbance-Performance Table” and on Section I.D, “NERC and WECC Standards for Voltage Support and Reactive Power.” These standards require that the results of power flow and stability simulations verify defined performance levels. Performance levels are defined by specifying the allowable variations in thermal loading, voltage and frequency, and loss of load that may occur on systems during various disturbances. Performance levels range from no significant adverse effects inside and outside a system area during a minor disturbance (loss of load or a single transmission element out of service) to a level that seeks to prevent system cascading and the subsequent blackout of islanded areas during a major disturbance

(such as loss of multiple 500 kV lines along a common right of way, and/or multiple generators). While controlled loss of generation or load or system separation is permitted in certain circumstances, their uncontrolled loss is not permitted (WECC Ongoing).

- NERC Reliability Standards for the Bulk Electric Systems of North America provide national policies, standards, principles and guidelines to assure the adequacy and security of the electric transmission system. The NERC Reliability Standards provide for system performance levels under normal and contingency conditions. With regard to power flow and stability simulations, while these Reliability Standards are similar to NERC/WECC Standards, certain aspects of the NERC/WECC Standards are either more stringent or more specific than the NERC Standards for Transmission System Contingency Performance. The NERC Reliability Standards apply not only to interconnected system operation but also to individual service areas (NERC Ongoing).

- California ISO Planning Standards also provide standards and guidelines to assure the adequacy, security and reliability in the planning of the California ISO transmission grid facilities. The California ISO Grid Planning Standards incorporate the NERC/WECC and NERC Reliability Planning Standards. With regard to power flow, stability simulations, Special Protection Systems and Load Interruption Standards, these Planning Standards are similar to the NERC/WECC or NERC Reliability Planning Standards for Transmission System Contingency Performance. However, the California ISO Standards also provide some additional requirements that are not address in the NERC / WECC standards, provide interpretations of the NERC/WECC criteria specific to the California ISO grid, and identify whether specific criteria should be adopted. The California ISO Standards apply to all participating transmission owners interconnecting to the California ISO controlled grid. They also apply when there are any impacts to the California ISO grid due to facilities interconnecting to adjacent controlled grids not operated by the California ISO. The California ISO standards will be revised from time to time to ensure they are consistent with the current state of the electrical industry and in conformance with NERC Reliability Standards and WECC Regional Criteria (Cal-ISO June, 23 2011).

- California ISO/Federal Energy Regulatory Commission (FERC) Electric Tariff provides guidelines for construction of all transmission additions/upgrades (projects) within the California ISO controlled grid. The California ISO determines the “Need” for the proposed modified project where it will promote economic efficiency or maintain system reliability. The California ISO also determines the Cost Responsibility of the proposed modified project and provides an Operational Review of all facilities that are to be connected to the California ISO grid (Cal-ISO 2007a).

PROJECT DESCRIPTION

The PTA proposes to modify the El Segundo Energy Center (ESEC) by replacing two once–through-cooled boiler units, units 3 and 4, with modern and efficient, dry cooled, natural-gas-fired combustion gas units. The proposed generators would consist of one

NRG fast start combined cycle unit rated at net 325 megawatts (MW) (Gas turbine generator and Heat Recovery steam generator) and two Rolls Royce simple-cycle gas turbine units each rated at 55 MW. The new installation units 9, 10, 11 and 12 will add net generation capacity of 435 MW to the plant. The combination of existing units 5 through 8 and modified units 9 through 12 will dispatch approximately net output of 995 MW to the California ISO grid. Therefore, net rated energy transmits from the modified plant to the California ISO grid is consistent with the present LGIA filed at the California ISO.

The 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. The project's 230 kV generator tie lines would connect to the 230 kV El Segundo substation by utilizing the existing 230 kV equipment. The interconnection and operation of the project would require the replacement of circuit breakers and wave traps in the SCE transmission network, no significant downstream facilities have been identified as a reasonably foreseeable consequence of the ESPFM.

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 rated as determined by the Detailed Facility Study (DFS). 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 230 kV generator tie lines would connect the project switchyard to the existing 230 kV El Segundo substation, with the existing 230 kV equipment located on site. The generator tie lines would build with bundled 765-kcmil Aluminum Conductor Steel Reinforced (ACSR) and are rated to carry the full load output of the project. No new offsite transmission facilities would be required to interconnect the project.

EXISTING FACILITIES AND RELATED SYSTEMS

The ESPFM 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 ESPFM would impact many transmission facilities in the SCE transmission network, although no significant downstream facilities will be required.

DOWNSTREAM IMPACTS[1]

The project impacts on the transmission system downstream of the interconnection facilities are discussed under System Reliability below. 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

Staff has used previous planning study information in this amendment to evaluate the impacts caused by the project into the California ISO grid. Staff finds the previous study is applicable due to unchanged net output of the project. Therefore the previous planning study information has been retained in this report.

SYSTEM RELIABILITY

Introduction

A system Impact study (SIS) 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 SIS and the subsequent letter from the project owner, staff has determined that the ESPFM would 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 California ISO. The project is modeled in the studies with an additional plant delivery of 280 MW for power flow analysis. The SIS 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 SIS was completed for the ESEC and several potential plants located near El Segundo are no longer viable. As a result, SCE has updated the DFS once for the ESEC, and an updated DFS was filed at the Energy Commission on May 21, 2002. The 2003 cases used as a basis for the studies are considered valid for the purpose of the California 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 project owner 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

Under N-0 conditions, addition of the project increases four pre-existing overloads.

1. The project triggers three new overloads for N-1 contingencies.
2. The project increases seven existing overloads for N-1 contingencies.
3. The project triggers two new overloads for N-2 contingencies.
4. The project increases five existing overloads for N-2 contingencies.

Load flow analysis for Heavy Summer 2003 conditions

Under N-0 conditions, addition of the project increases two pre-existing overloads.

1. The project triggers three new overloads for N-1 contingencies.
2. The project increases three existing overloads for N-1 contingencies.
3. The project triggers one new overload for N-2 contingencies.
4. 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 ESPFM 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 modified 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 project owner 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 ESPFM. Breaker work and any substation equipment replacement will occur inside the fence lines of the existing substation.

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).

California ISO Review

The California ISO review of the project owner's submittals supports the Energy Commission staff's analysis, states preliminary interconnection approval, and recommends further study for the EL Segundo Project (Cal-ISO 2001a) (called the ESEC at the Energy Commission). The Facility Study identified an alternative that will mitigate overloads with SPS and will not require the upgrade of existing transmission lines. The project owner 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 ESPFM 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 California ISO final interconnection approval is in conformance with NERC, WSCC and California ISO reliability criteria.

Alternative Transmission Line Routes

Due to the use of existing on-site facilities, Energy Commission staff concludes no alternatives would be feasible at the site that would vary significantly from the ESPFM'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 ESPFM. SIS and the DFS both indicate that there are facility overloads caused by other proposed generators that would be exacerbated by the ESPFM. However, whether or not these other generators will ever be permitted and operated is very uncertain.

Since the SIS was completed for the ESEC in December 18, 2000, there have been significant changes in the generators proposed in the SCE area. The California 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 ESPFM 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 ESPFM and other proposed projects, these potential impacts are highly

speculative because of the uncertainty surrounding the other generators. Impacts caused by the ESPFM will be mitigated as previously discussed.

NOTEWORTHY PUBLIC BENEFITS

The ESPFM would increase the amount of quick start capacity in California and the Los Angeles Basin area. The project could be part of the portfolio of resources needed to reliably supply electricity in California. This portfolio could provide the quick start capacity needed to back-up intermittent renewable generation and could also be part of the fleet of resources needed to replace the recently retired San Onofre Nuclear Generating Station. Located near large southern California load centers, the project would also provide voltage support and help maintain system stability.

RESPONSE TO AGENCY AND PUBLIC COMMENTS

There were no comments on the TSE analysis.

CONCLUSIONS AND RECOMMENDATIONS

The modifications of the El Segundo Energy Center LLC petition do not impact the previously approved 230kV plant switchyard, outlet lines, and termination facilities. The certified facilities are adequate and in accordance with industry standards and good utility practices and are acceptable to Staff according to engineering LORS.

- The project modifications do not affect the net output of the power plant. Therefore, the existing 230kV plant switchyard and generator-tie lines are adequate and are rated to withstand the net output of the project.
- The Large Generator Interconnection Agreement for the generator replacement is being evaluated by the California Independent System Operator. The LGIA will be amended if there are any changes are required.
- Staff believes previous planning study is applicable in this amendment due to unchanged net output of the modified project.

Staff concludes that these facilities will comply with LORS, assuming the Conditions of Certification **TSE-1** through **TSE-8** 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 ESPFM.

CONDITIONS OF CERTIFICATION

Staff does not propose any changes to the existing conditions of certification.

TSE-1 The project owner shall furnish to the CPM and to the CBO a schedule of transmission facility design submittals, a Master Drawing List, a Master Specifications List, and a Major Equipment and Structure List. The schedule

shall contain a description and list of proposed submittal packages for design, calculations, and specifications for major structures and equipment. To facilitate audits by Energy Commission staff, the project owner shall provide designated packages to the CPM when requested.

Verification: At least 60 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of construction, the project owner shall submit the schedule, a Master Drawing List, and a Master Specifications List to the CBO and to the CPM. The schedule shall contain a description and list of proposed submittal packages for design, calculations, and specifications for major structures and equipment (see a list of major equipment in **Table 1: Major Equipment List** below). Additions and deletions shall be made to the table only with CPM and CBO approval. The project owner shall provide schedule updates in the Monthly Compliance Report.

Table 1: Major Equipment List
Breakers
Step-up Transformer
Switchyard
Busses
Surge Arrestors
Disconnects
Take off facilities
Electrical Control Building
Switchyard Control Building
Transmission Pole/Tower
Grounding System

TSE-2 Prior to the start of construction the project owner shall assign an electrical engineer and at least one of each of the following to the project: A) a civil engineer; B) a geotechnical engineer or a civil engineer experienced and knowledgeable in the practice of soils engineering; C) a design engineer, who is either a structural engineer or a civil engineer fully competent and proficient in the design of power plant structures and equipment supports; or D) a mechanical engineer. (Business and Professions Code Sections 6704 et seq., require state registration to practice as a civil engineer or structural engineer in California.)

The tasks performed by the civil, mechanical, electrical or design engineers may be divided between two or more engineers, as long as each engineer is responsible for a particular segment of the project (e.g., proposed earthwork, civil structures, power plant structures, equipment support). No segment of the project shall have more than one responsible engineer. The transmission line may be the responsibility of a separate California registered electrical engineer. The civil, geotechnical or civil and design engineer assigned in conformance with Facility Design condition **GEN-5**, may be responsible for design and review of the TSE facilities.

The project owner shall submit to the CBO for review and approval, the names, qualifications and registration numbers of all engineers assigned to the project.

If any one of the designated engineers is subsequently reassigned or replaced, the project owner shall submit the name, qualifications and registration number of the newly assigned engineer to the CBO for review and approval. The project owner shall notify the CPM of the CBO's approval of the new engineer. This engineer shall be authorized to halt earthwork and to require changes; if site conditions are unsafe or do not conform with predicted conditions used as a basis for design of earthwork or foundations.

The electrical engineer shall:

1. Be responsible for the electrical design of the power plant switchyard, outlet and termination facilities; and

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

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

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

TSE-3 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 plan switchyard and other switchyards, where applicable, shall be sized to comply with a short-circuit analysis.

c) Outlet line crossings and line parallels with transmission and distribution facilities shall be coordinated with the transmission line owner and comply with the owner's standards.

d) The project conductors shall be sized to accommodate the full output from the project.

e) Termination facilities shall comply with applicable SCE 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 California ISO Notice of Synchronization.

Verification: At least 60 days prior to the start of construction of transmission facilities (or a lessor 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 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.

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

TSE-7 The project owner shall provide the following Notice to the California Independent System Operator (California 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 California 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 California ISO letter to the CPM when it is sent to the California ISO one week prior to initial synchronization with the grid. The project owner shall contact the California 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 California 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".

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

CEC 2013a-CEC /C. Marxen (TN 90818). Notice of Recipt for the Petion to Amend, dated 5/14/2013. Submitted to CEC on 4/23/2013.

California ISO (California Independent System Operator) Tariff, Ongoing, – California ISO Tariff Scheduling Protocol posted July 11, 2013, http://www.caiso.com/rules/Pages/Regulatory/Default.aspx.

California ISO (California Independent System Operator) July, 2013b – California ISO Dynamic Scheduling Protocol (DSP) posted July, 2013.

California ISO (California Independent System Operator) 2011a – California ISO Planning Standards.

California ISO (California Independent System Operator) posted July 11, 2013 Ongoing – California ISO, FERC Electric Tariff, http://www.caiso.com/rules/Pages/Regulatory/Default.aspx.

CPUC GO-95 California Public Utilities Commission General Order 95 (CPUC GO 95). http://www.cpuc.ca.gov/gos/GO95/go_95_startup_page.html

CPUC GO-128 California Public Utilities Commission General Order 128 (CPUC GO 128). http://162.15.7.24/gos/OriginalGO128/index.htm

NERC (North American Electric Reliability Council) Ongoing – Reliability Standards for the Bulk Electric Systems of North America, http://www.nerc.com/pa/Stand/Pages/Default.aspx.

NESC (National Electric Safety Code) 2012 – IEEE Standards Association NESC Updated 2012.

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.

WECC (Western Electricity Coordinating Council) Reliability Standards – NERC/WECC Reliability Standards, http://www.wecc.biz/Standards/Pages/default.aspx.

DEFINITION OF TERMS

TERM	DEFINITION
AAC	All aluminum conductor.
ACSR	Aluminum conductor steel-reinforced.
ACSS	Aluminum conductor steel-supported.
Ampacity	Current-carrying capacity, expressed in amperes, of a conductor at specified ambient conditions, at which damage to the conductor is nonexistent or deemed acceptable based on economic, safety, and reliability considerations
Ampere	The unit of current flowing in a conductor.
Bundled	Two wires, 18 inches apart.
Bus	Conductors that serve as a common connection for two or more circuits.
Conductor	The part of the transmission line (the wire) that carries the current.
Congestion Management	A scheduling protocol that ensures dispatched generation and transmission loading (imports) will not violate criteria
Double Contingency	Also known as emergency or N-2 condition, occurs when a forced outage of two system elements occurs -- usually (but not exclusively) caused by a single event. Examples of an N-2 contingency include loss of two transmission circuits on single tower line or loss of two elements connected by a common circuit breaker due to the failure of that common breaker.
Emergency Overload	See Single Contingency condition. This is also called an N-1.
Kcmil or KCM	Thousand circular mil. A unit of the conductor's cross sectional area; when divided by 1,273, the area in square inches is obtained.
Kilovolt (kV)	A unit of potential difference, or voltage, between two conductors of a circuit, or between a conductor and the ground
Loop	An electrical cul de sac. A transmission configuration that interrupts an existing circuit, diverts it to another connection, and returns it back to the interrupted circuit, thus forming a loop or cul de sac.
Megavar	One megavolt ampere reactive.
Megavars	Mega-volt-ampere-reactive. One million volt-ampere-reactive. Reactive power is generally associated with the reactive nature of motor loads that must be fed by generation units in the system.
Megavolt Ampere (MVA)	A unit of apparent power, equals the product of the line voltage in kilovolts, current in amperes, the square root of 3, divided by 1,000.
Megawatt (MW)	A unit of power equivalent to 1,341 horsepower.
N-0 Condition	See Normal Operation/Normal Overload, below
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

TERM	DEFINITION
(N-0)	transmission system is loaded beyond its continuous rating.
N-1 Condition	See Single Contingency, below
N-2 Condition	See Double Contingency, above
Outlet	Transmission facilities (circuit, transformer, circuit breaker, etc.) linking generation facilities with the main grid.
Power Flow Analysis	A power flow analysis is a forward-looking computer simulation of essentially all generation and transmission system facilities that identifies overloaded circuits, transformers, and other equipment and system voltage levels.
Reactive Power	Reactive power is generally associated with the reactive nature of motor loads that must be fed by generation units in the system. An adequate supply of reactive power is required to maintain voltage levels in the system.
Remedial Action Scheme	A remedial action scheme is an automatic control provision that, as one example, will trip a selected generating unit when a circuit overloads.
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, covered by a metallic shield and outer polyethylene jacket.
Special Protection Scheme/System	Detects a transmission outage (either a single or credible multiple contingency) or an overloaded transmission facility, then trips or runs back generation output to avoid potential overloaded facilities or other criteria violations.
Switchyard	A power plant switchyard is an integral part of a power plant that' used as an outlet for one or more electric generators.
Thermal Rating	See ampacity
TSE	Transmission System Engineering
Tap	A transmission configuration that creates an interconnection through a short single circuit to a small or medium-sized load or generator. The new single circuit line is inserted into an existing circuit by utilizing breakers at existing terminals of the circuit, rather than installing breakers at the interconnection in a new switchyard.
Undercrossing	A transmission configuration where a transmission line crosses below the conductors of another transmission line, generally at 90 degrees.
Underbuild	A transmission or distribution configuration where a transmission or distribution circuit is attached to a transmission tower or pole below (under) the principle transmission line conductors.

ALTERNATIVES

Testimony of Steven Kerr

SUMMARY OF CONCLUSIONS

This section evaluates a reasonable range of alternatives to the proposed El Segundo Power Facility Modification (ESPFM) at the El Segundo Energy Center (ESEC). California Energy Commission (Energy Commission) staff has not identified a feasible alternative that would be environmentally superior to the proposed ESPFM, including the "no project" alternative. The range of alternatives considered by staff in addition to the "no project" alternative includes alternative site locations, alternative site configurations, and alternative technologies. Each of these alternatives have been eliminated from detailed consideration due to a failure to meet most of the basic project objectives, infeasibility, inability to avoid significant environmental impacts, or any combination thereof.

CEQA REQUIREMENTS

As lead agency for the proposed ESPFM, the Energy Commission is required to consider and discuss alternatives to the proposed project. The guiding principles for the selection of alternatives for analysis are provided by the California Environmental Quality Act Guidelines (CEQA Guidelines) (Cal. Code Regs., tit. 14, §15000 et seq.). According to section 15126.6 of the CEQA Guidelines, the alternatives analysis must:

- Describe 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.
- Consider alternatives that would avoid or substantially lessen any significant environmental impacts of the proposed project, including alternatives that would be more costly or would otherwise impede the project's objectives.
- Evaluate the comparative merits of the alternatives.

The lead agency is responsible for selecting a range of project alternatives for examination and must publicly disclose its reasoning for selecting those alternatives (Cal. Code Regs., tit. 14, §15126.6, subd. (a)). CEQA does not require an Environmental Impact Report (EIR) to "consider every conceivable alternative to a project. Rather, CEQA requires consideration of a "reasonable range of potentially feasible alternatives." The reasonable range of alternatives must be selected and discussed in a manner that fosters meaningful public participation and informed decision making (Cal. Code Regs., tit. 14, §15126.6, subd. (f)). That is, the range of alternatives presented in this analysis is limited to ones that will inform a reasoned choice by the Energy Commission. Under the "rule of reason," an agency need not consider an alternative whose effect cannot be reasonably ascertained and whose implementation is remote and speculative (Cal. Code Regs., tit. 14, §15126.6, subd. (f)(3)).

The CEQA lead agency is also required to:

(1) Evaluate a “no project” alternative.

(2) Identify alternatives that were initially considered but then rejected from further evaluation.

(3) Identify an environmentally superior alternative among the other alternatives if the environmentally superior alternative is the “no project” alternative (Cal. Code Regs., tit. 14, §15126.6).

Alternatives may be eliminated from detailed consideration by the lead agency if they fail to meet most of the basic project objectives, are infeasible, or could not avoid any significant environmental effects (Cal. Code Regs., tit. 14, §15126.6, subd.(c)).

PROJECT OBJECTIVES

The California Independent System Operator (California ISO) has identified the importance for new power generation facilities in their Los Angeles Basin Local Reliability Area to replace the ocean water once-through-cooling (OTC) plants that are expected to retire as a result of the California State Water Resources Control Board’s (SWRCB) *Water Quality Control Policy on the Use of Coastal and Estuarine Waters for Power Plant Cooling* (referred to as the OTC Policy). The project objectives are also consistent with the use of the offset exemption contained within the South Coast Air Quality Management District’s (SCAQMD) Rule 1304(a)(2) that allows for the replacement of older, less efficient, electric utility steam boilers with specific new generation technologies on a megawatt-to-megawatt basis.

As described in the Petition to Amend (PTA), the facility owner’s specific project objectives are as follows:

- Maximize use of limited existing air offsets by replacing older generating equipment with new low-emission combustion turbine equipment that will significantly reduce air pollutant emissions as compared to the boilers they are replacing, pursuant to South Coast Air Quality Management District (SCAQMD) Rule 1304.
- Redevelop brownfield site in proximity to existing infrastructure.
- Install air-cooled condenser and eliminate need for once-through ocean water cooling process.
- Remove existing once-through cooling process at ESEC as a means to meet the state’s once-through cooling policy, consistent with El Segundo Energy Center LLC’s (ESEC LLC) stated Once-Through Cooling Implementation Plan to retire Units 3 and 4 by December 31, 2015, and replace the generation via Track 1 compliance path.

- Provide grid stability to accommodate increased renewable energy generation by adding dispatch capabilities to accommodate planned and unplanned grid outages in response to excessive demands and natural disasters.

- Incorporate visual elements into facility design consistent with the ESEC license and subsequent PTAs related to 00-AFC-14C that considers community input.

- Integrate community-defined site improvements, including improvements to pedestrian/bicycle use of bike path, landscaping and frontage improvements.

- Improve fire, emergency, public safety, and environmental protections through installation and operation of new more efficient generating units.

- Improve public access through implementation of existing Conditions of Certification **LAND- 9** through **LAND-11**.

Based upon a review of the facility owner's project objectives, staff developed the following objectives to complete an alternatives analysis. These objectives are consistent with the project owner's proposal but are not so narrow that they are only limited to the construction of the ESPFM as proposed.

- Redevelop brownfield site in proximity to existing electrical, water, wastewater, and natural gas infrastructure.

- Maximize use of limited existing air offsets by replacing older electric utility steam boilers with advanced gas turbines, including combined cycle and simple cycle configurations, pursuant to SCAQMD Rule 1304.

- Site the project to serve the load area without constructing new transmission facilities.

- Develop a 448.8 MW power generation plant that provides efficient operational flexibility with rapid-start and fast ramping capability to allow for efficient integration of renewable energy sources in the California electrical grid.

- Provide efficient, reliable and predictable power supply by using combined-cycle and simple cycle natural gas-fired combustion turbines.

- Be able to support the local capacity requirements of Southern California's Los Angeles Basin Local Reliability Area.

ENERGY COMMISSION STAFF'S ALTERNATIVES SCREENING PROCESS

The CEQA Guidelines describe selection of a reasonable range of alternatives and the requirement to include those that could feasibly accomplish most of the basic project objectives while avoiding or substantially lessening one or more of the significant effects (Cal. Code Regs., tit. 14, §15126.6, subd. (c)). The CEQA Guidelines address the requirement for the alternatives analysis to briefly describe the rationale for selecting alternatives to be discussed. The analysis should identify any alternatives that were

considered by the lead agency but were rejected as infeasible and briefly explain the reasons underlying the lead agency's determination.

The CEQA Guidelines list factors that may be considered when addressing feasibility of alternatives: site suitability; economic viability; availability of infrastructure; general plan consistency; other plans or regulatory limitations; jurisdictional boundaries; and whether the proponent can reasonably acquire, control or otherwise have access to the alternative site (or the site is already owned by the proponent). No one of these factors establishes a fixed limit on the scope of reasonable alternatives (Cal. Code Regs., tit. 14, §15126.6, subd. (f)(1)).

Pursuant to CEQA, the purpose of staff's alternatives analysis is to identify the potential significant impacts of the ESPFM and to focus on alternatives that are capable of avoiding or substantially reducing those impacts while still meeting most of the basic project objectives.

To prepare the analysis of alternatives, staff used the methodology summarized below:

- Describe the objectives of the project and compare those against potentially feasible alternatives to the project.
- Identify any potential significant environmental impacts of the project.
- Identify and evaluate alternatives to the project which would mitigate impacts.
- Evaluate a "no project" alternative to compare the impacts of approving the project to the impacts of not approving the project.

ALTERNATIVES ELIMINATED FROM DETAILED CONSIDERATION

Section 15126.6, subdivision (c) of the CEQA Guidelines describes selection of a reasonable range of alternatives and the requirement to include those that could feasibly accomplish most of the basic project objectives while avoiding or substantially lessening one or more of the significant effects. The analysis should identify any alternatives that were considered by the lead agency but were rejected as infeasible. CEQA requires a brief explanation of the reasons underlying the lead agency's determination to eliminate alternatives from detailed analysis.

The following alternatives were considered but eliminated from detailed consideration. Those alternatives that were not carried forward for full analysis include Alternative Sites, Alternative Site Configuration, Technology Alternatives, and the No-Project Alternative. The following provides staff's reasons for eliminating these alternatives from detailed analysis.

Alternative Sites

Relationship of the Proposed ESPFM to the Project Site

The Warren-Alquist Act addresses aspects of an applicant's site selection criteria for thermal power plants and the use of an existing industrial site for such use when the

project has a strong relationship to the existing industrial site. When this is the case, it is "reasonable not to analyze alternative sites for the project" (Pub. Resources Code, § 25540.6, subd. (b)). The analysis below addresses the project's strong relationship to the project site, both from a regulatory and practical standpoint, and provides a framework for staff's selection of the project alternatives.

Use of the Existing ESEC site for Electrical Power Generation

The long-term historical use of the project site for electrical power generation is applicable to the discussion of the project's strong relationship to the site. This analysis recognizes the fact that the proposed ESPFM would be constructed and operated at the existing ESEC site.

Originally built in the 1950s, the ESEC (formerly known as the El Segundo Generating Station) was a 1,052 MW power plant, consisting of four simple-cycle, natural gas-fired, utility boiler generating units. In 2000, the facility owner applied to the Energy Commission to demolish and replace Units 1 and 2 with combined-cycle Units 5, 6, and 7, and continue the use of once-through cooling. The modified project was certified by the Energy Commission on February 3, 2005. (CEC 2005a) In 2007, the facility owner petitioned to amend the 2005 Energy Commission Decision, seeking to install smaller, rapid-start, combined-cycle units, using dry-cooling technology, to be designated as Unit 5 and 6 and Unit 7 and 8. (CEC 2010a) The Energy Commission approved this amendment on June 30, 2010. As part of this PTA, Unit 3 had to cease operation prior to Units 5–8 becoming operational and producing power. NRG started construction on Units 5-8, in June 2011, and the project started commercial operation in August 2013.

The ESEC site has a General Plan land use designation of Heavy Industrial with consistent zoning. The project as proposed in the PTA would make use of much of the infrastructure of the existing site, including the existing water supply, drainage system, wastewater system, natural gas supply line, and access to the adjacent Southern California Edison (SCE) switchyard to connect to the transmission grid. Off-site infrastructure is not proposed or required. Additionally, staff notes that the proposed project would use recycled water exclusively for industrial operation, therefore, including a recycled water alternative in this analysis was not applicable.

Expansion of Existing Coastal Power Plants

The California Coastal Act of 1976 (Coastal Act) protects coastal resources from the major impacts of power plant siting. In 1978, the California Coastal Commission (Coastal Commission) adopted a report that satisfied a requirement of the Coastal Act to designate specific locations in the coastal zone where the location of an electric generating facility would prevent the achievement of the objectives of the Coastal Act (Pub. Resources Code, § 30413, subd. (b)). The 1978 report was revised in 1984 and re-adopted in 1985 (Coastal Commission 1985). In accordance with the Coastal Act, the report designates sensitive resource areas along the California coast as unsuitable for power plant construction and provides "that specific locations that are presently used for such facilities and reasonable expansion thereof shall not be so designated." This policy encourages expansion of existing power plant sites if new plants are necessary, thereby protecting undeveloped coastal areas (Coastal Commission 1985).

In a related effort, the Energy Commission prepared a 1980 study that examined opportunities for the *reasonable expansion* of existing power plants in the state's Coastal Zone and reviewed the effects of the designated resource areas on expansion opportunities (Energy Commission 1980). The 1980 study defines *reasonable* in this context to mean the provision or maintenance of land area adequate to satisfy a specific site's share of the state's need for increased electrical power generating capacity over the Energy Commission's planning intervals of 12 and 20 years (Energy Commission 1980). The study also gives practical consideration to coastal power plant expansion and siting opportunities. The ancillary support facilities already exist at the power plant sites, and the industrial-type land use has been established, which are important points to consider from a practical standpoint (Energy Commission 1980).

The expansion areas should be inside or adjacent to the existing site boundaries, or within a distance that would permit the cost effective use of the existing power plant support facilities, where necessary or advisable.

The 1980 study describes expansion opportunities for various combinations of plant types and sizes at 20 of the 25 evaluated sites. The El Segundo power plant is characterized as having "available land constraints that essentially prohibit on-site expansion of any kind other than repowering. Off-site expansion would require the relocation of adjacent refinery storage facilities to provide adequate area. The plant's southern boundary immediately abuts private residential and public beach areas" (Energy Commission 1980). The proposed ESPFM project would be located inside the existing ESEC, and no off-site expansion of power plant facilities would be required.

Alternative Site Summary

Any alternative that would, in theory, require conversion of some other area of similar acreage to a new electrical power generation facility would bring into question some of the feasibility issues listed above. El Segundo Energy Center, LLC owns and has full access to the ESEC site, and no other site is identified where the facility owner could reasonably acquire site access to allow the timely completion of necessary environmental reviews, permitting, and approvals. The extent to which development of a different site could meet the project objectives is unknown, although it is questionable whether any off-site alternative would allow the project to remain a viable proposal given the likely extreme project schedule delay that would accompany a change of project site. In that circumstance, none of the project objectives would be attained for the proposed ESPFM. Staff's analysis provides evidence of the proposed project's strong relationship to the project site, and given the uncertain potential for development of any alternative site to achieve the project objectives, offsite alternatives were eliminated from detailed consideration.

Alternative Site Configurations

Site Constraints

The existing Units 3 and 4 occupy approximately 4 to 5 acres of the overall ESEC site. The facility owner has proposed a modification that is designed to replace the existing Units 3 and 4 within the same footprint. The locations of existing on-site infrastructure

within the ESEC site, including the relatively new Units 5 through 8, and the adjacent residential community to the south are constraints on other potential site configurations.

The large paved area in the southern portion of the property previously contained two large oil storage tanks that have been removed. This area is proposed to remain open and a buffer for the houses along 45th Street in the city of Manhattan Beach. The facility owner proposes to relocate the administration building to the northern edge of the previous tank farm as shown on **Project Description Figures 3 and 4**. Staff does not propose any technologies or site modifications that would include power generating facilities in this open area.

Administration Building

The proposed administration building would be a contemporary design, entailing extensive use of glass, and a masonry structure with a flat gray finish similar to the finish of the other project structures. See **Project Description Figures 9, 10 and 11.** It would be two stories (up to 40 feet tall), which would partially screen the view of the plant's industrial features. Adjacent to the north side of the administration building, in the general area of the existing retention basin, space for maintenance, equipment storage, and warehouse access at plant grade would be provided. This area would be on the "back side" of the administration building, screened from the neighboring community to the south.

The administration building would be set back from the western property boundary by a perimeter roadway, sloped berm and bioswale. The visual impacts from the administration building were not found to be significant with conditions of certification included. Staff is not requesting that the building be moved because of visual impacts.

While alternative site configurations would likely meet most of the basic project objectives, they would not avoid or substantially lessen the project impacts identified in this FSA that could otherwise be mitigated to less than significant levels for the ESPFM as proposed. Demolishing the existing Units 3 and 4 to make room for the proposed Units 9 through 12 would continue the use of a portion of the ESEC site that has traditionally been used for electric generation. Siting the administration building within the former tank farm area and maintaining an open buffer area on the southern portion of the ESEC site would be compatible with the neighboring residential area. A reconfigured alternative expanding energy generation to this remaining open portion of the site would potentially cause significant effects in addition to those that would be caused by the project as proposed. Based on these conclusions, staff has eliminated alternative site configurations from further discussion.

Technology Alternatives

The facility owner selected a single train of 1x1 General Electric (GE) "CC Fast"—a net 325 MW, air-cooled, fast start, combined-cycle plant utilizing the Heller cooling system, duct burners, and auxiliary boiler because this configuration offers more megawatts per square footage site area and more efficiency with respect to greenhouse (GHG) emissions/heat rate as compared to a single train of the Siemens Flex Plant 10 configuration recently completed. The GE CC Fast configuration qualifies for exemption

from emission offsets requirement according to SCAQMD Rule 1304(a)(2) - Electric Utility Steam Boiler Replacement in the South Coast Air Basin. The CC Fast includes a fast start like the Siemens Flex Plant 10, as well as traditional start ups.

The Rolls Royce Trent 60 turbines were selected because they are aeroderivative gas turbines that are intercooled (via wet compression technology). They qualify as advanced gas turbines according to SCAQMD Rule 1135 with NOx emissions less than 0.10 pounds per net megawatt-hour (lb/net MWh). They qualify for exemption from emission offsets requirement according to SCAQMD Rule 1304(a)(2) - Electric Utility Steam Boiler Replacement in the South Coast Air Basin. Larger peaking units, such as the GE LMS100, have qualified for the SCAQMD Rule 1304 exemption as well. The facility owner considered GE LMS100s, but the project area is too small to accommodate two LMS100s, and likely could not accommodate the cooling system required for a single LMS100. Compared to GE LMS100s, the Trent 60s would: (1) offer a lower minimum energy output (approximately 29 MW) than larger peaking units such as GE LMS100s, (2) are of similar efficiency as the LMS100s, and (3) occupy less space than the LMS100s, especially the water-cooled version of the LMS100.

Further, the Trent 60s would require less water for cooling, and their cooling systems would be smaller than those of the GE LMS100s. By placing the two Trent 60s (with a maximum nominal net output of 55 MW individually), the facility owner can maximize the number of megawatts (110 MW net) per square foot area in contrast to a single, larger LMS100, which has an output of 100 MW. The facility owner's use of two Trent 60s, each with operating ranges of 29 MW to 55 MW for each turbine, would provide the grid with more peaking capacity options than a single 100 MW unit.

The facility owner considered other combined-cycle configurations and peaking combustion turbines in the months leading up to its air permit filing in March 2013, and its submission of the PTA in April 2013. However, none of these other configurations or turbines offered the (1) megawatt density to effectively maximize the megawatts per square foot desired to be generated at the ESEC site, (2) efficiency with respect to GHG emissions/heat rate, and (3) flexibility of megawatt output range from minimum to maximum. (LL 2013e)

The facility owner has selected a mix of natural gas combined cycle and natural gas simple cycle components utilizing fast start and dispatch flexibility in order to support southern California grid load balancing and renewable energy integration (NRG 2013a, § 1.1). This configuration would provide an important element in the introduction of renewable energy sources by providing a bridge for power-loss intermittencies characteristic of wind turbines, solar photovoltaic, and solar thermal electric generation systems. Given the project objectives, location, and the commercial experience of the selected technologies, staff agrees with the facility owner that only natural gas-burning technologies are feasible for this project.

As an alternative to the ESPFM, retrofitting existing Units 3 and 4 of the ESEC while maintaining the existing boilers would not provide the operating flexibility and efficiency

improvement offered by the 7FA combined cycle and Trent 60 simple cycle trains in a hybrid configuration.

For additional information regarding the ESPFM project configuration and equipment selection please refer to the **Power Plant Efficiency** section of this FSA.

No Project Alternative

This analysis evaluates the No-Project Alternative to the ESPFM to fulfill the requirements of section 15126, subdivision (e) (1) of CEQA. As discussed in the subsection "Energy Commission Staff's Alternatives Screening Process," the Energy Commission is required to compare the impacts of approving the proposed project to the impacts of not approving the project. The "no project" analysis shall discuss the existing conditions at the time the environmental analysis is commenced, as well as what would be reasonably expected to occur in the foreseeable future if the project were not approved (Cal. Code Regs., tit. 14, §15126.6, subd. (e) (2)).

The ESEC Units 3 and 4 are existing power facilities from the 1950s and 1960s. Unit 3 ceased operation in July 2013 and is not allowed to operate because of a lack of air credits by the SCAQMD. Unit 4 is currently operating and is scheduled to cease operating because of the use of OTC by December 31, 2015.

The most reasonably expected "no project" alternative is that Unit 4 would continue to operate until the end of 2015 and then cease operations. Unit 4 would be decommissioned and then Units 3 and 4 would be left in place. There are no conditions of certification that require the demolition of Units 3 and 4. The facility owner has indicated these facilities would remain on site.

If the No-Project Alternative was selected, the demolition, construction, and operational impacts from the proposed ESPFM would not occur. As determined by Energy Commission staff in this FSA, the demolition, construction, and operation of the ESPFM is not likely to cause potentially significant adverse impacts with the incorporation of staff's recommended modifications to the conditions of certification. Additionally, the existing visual condition of the ESEC site and viewshed would remain visually degraded by leaving the existing Units 3 and 4 in place and the opportunity to enhance the visual quality of the site through the installation of the smaller and considerably less tall and bulky proposed Units 9 through 12 would be missed. Therefore, selecting the No-Project Alternative over the proposed ESPFM would be inconsistent with Section 30251 of the Coastal Act, which requires permitted developments "…where feasible, to restore and enhance visual quality in visually degraded areas."

The facility owner is currently bidding into a Request for Offers (RFO) process with SCE. This process is requesting bids to provide power to supply between 1,200 and 1,700 MWs to replace the energy provided by the San Onofre Nuclear Generating Station. The proposed ESPFM would satisfy the RFO requirements.

If the project is not built, the region would not benefit from the relatively efficient source of 448.8 MW of new generation that this facility would provide. This new generation

would increase the supply of energy and potentially serve load demands in the Los Angeles Basin.

If no new natural gas plants were constructed, reliance on older power plants may increase. These plants would consume more fuel and emit more air pollutants per kilowatt-hour generated than the proposed project. In the near term, the more likely result is that existing plants, many of which produce higher level of pollutants, would operate more than they do now.

As stated in the “Technology Alternatives” subsection above, retrofitting existing Units 3 and 4 of the ESEC to eliminate the use of OTC, while maintaining the existing boilers would not provide the operating flexibility and efficiency improvement offered by the 7FA combined cycle and Trent 60 simple cycle trains in a hybrid configuration as proposed for ESPFM. Furthermore, Unit 3 is currently non-operational and lacks air credits to be allowed to operate so this alternative would be infeasible under current regulations and would fail to meet most of the project objectives.

Units 3 and 4 are older power generation facilities that the state is looking to replace with fast-start and dispatch flexibility capabilities to provide grid stability to accommodate increased renewable energy and provide back-up for planned and unplanned grid outages in response to excessive demands. Thus, the No-Project Alternative would also fail to meet the most of the basic project objectives.

RESPONSE TO AGENCY AND PUBLIC COMMENTS

Staff has not received comments on aspects of the ESPFM related to alternatives.

CONCLUSIONS

Staff has not identified a feasible alternative that would be environmentally superior to the proposed ESPFM, including the “no project” alternative. Staff considered a reasonable range of alternatives to the proposed project, including alternative site locations, alternative site configurations, and alternative technologies. Each of these alternatives have been eliminated from detailed consideration due to a failure to meet most of the basic project objectives, infeasibility, inability to avoid significant environmental impacts, or any combination thereof. As determined by Energy Commission staff in this FSA, the demolition, construction, and operation of the ESPFM is not likely to cause potentially significant adverse impacts with the incorporation of staff’s recommended modifications to the conditions of certification.

Staff concludes that:

- Locating the proposed ESPFM Units 9 through 12 at an alternative site would have feasibility issues because the facility owner, ESEC LLC, owns and has full access to the ESEC site, and no other site is identified where the facility owner could reasonably acquire site access to allow the timely completion of necessary environmental reviews, permitting, and approvals. The extent to which

development of a different site could meet the project objectives is unknown, although it is questionable whether any off-site alternative would allow the project to remain a viable proposal given the likely extreme project schedule delay that would accompany a change of project site. In that circumstance, none of the project objectives would be attained.

- While alternative site configurations would likely meet most of the basic project objectives, they would not avoid or substantially lessen the project impacts identified in this Final Staff Assessment (FSA) that could otherwise be mitigated to a level of insignificance for the ESPFM as proposed. Demolishing the existing Units 3 and 4 to make room for the proposed Units 9 through 12 would continue the use of a portion of the ESEC site that has traditionally been used for electric generation. Siting the administration building within the former tank farm area and maintaining an open buffer area on the southern portion of the ESEC site would be compatible with the neighboring residential area. A reconfigured alternative that would expand energy generation to this remaining open portion of the site would potentially cause significant effects in addition to those that would be caused by the project as proposed.

- The facility owner has selected a mix of natural gas combined cycle and natural gas simple cycle components utilizing fast start and dispatch flexibility in order to support southern California grid load balancing and renewable energy integration (NRG 2013a, § 1.1). This configuration would provide an important element in the introduction of renewable energy sources by providing a bridge for power-loss intermittencies characteristic of wind turbines, solar photovoltaic, and solar thermal electric generation systems. Given the project objectives, location, and the commercial experience of the selected technologies, staff agrees with the facility owner that only natural gas-burning technologies are feasible for this project.

- Units 3 and 4 are older power generation facilities that the state is looking to replace with fast-start and dispatch flexibility capabilities to provide grid stability to accommodate increased renewable energy and provide back-up for planned and unplanned grid outages in response to excessive demands. Thus, the No-Project Alternative (i.e., continued operation of Unit 4 until the end of 2015) would fail to meet most of the basic project objectives.

REFERENCES

CEC 2005a – CEC (CEC-800-2005-001-CMF). El Segundo Power Redevelopment Project Commission Decision, dated 2/2005.

CEC 2010a – CEC (CEC-800-2010-015). El Segundo Power Redevelopment Project Amendment Commission Decision, dated 6/2010.

Coastal Commission 1985 – *Designation of Coastal Zone Areas Where Construction of an Electric Power Plant Would Prevent Achievement of the Objectives of the California Coastal Act of 1976*. Adopted September 1978. Revised 1984. Re-adopted December 1985. San Francisco, CA.

Energy Commission 1980 – *Opportunities to Expand Coastal Power Plants in California*. Staff Report P700-80-001. June 1980. Sacramento, CA.

LL 2013e – Locke Lord / J. McKinsey (TN 200464). Applicant's Responses to Data Requests in Set One (#1-83). Submitted to CEC on 9/12/2013.

NRG 2013a – NRG / El Segundo Energy Center LLC (TN 70442) Petition to Amend, dated April 2013. Submitted to CEC on 04/23/2013.

COMPLIANCE CONDITIONS
AND
COMPLIANCE MONITORING PLAN

Christine Stora

INTRODUCTION

The El Segundo Energy Center (ESEC) Compliance Conditions of Certification, including a Compliance Monitoring Plan (Compliance Plan), are established as required by Public Resources Code section 25532. These conditions are being updated to incorporate the most current Compliance Conditions of Certification into the El Segundo Power Facility Modification (ESPFM) amendment. The Compliance Plan provides a means for assuring that the facility is constructed, operated, and closed in compliance with public health and safety and environmental law; all other applicable laws, ordinances, regulations, and standards (LORS); and the conditions adopted by the Energy Commission and specified in the Commission's written Decision on the project's Application for Certification, or otherwise required by law.

The Compliance Plan is composed of elements that:

- Set forth the duties and responsibilities of the compliance project manager (CPM), the project owner or operator (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 of certification;
- Establish contingency planning, facility non-operation protocols, and closure requirements; and
- Establish a tracking method for the technical area conditions of certification that contain measures required to mitigate potentially adverse project impacts associated with construction, operation, and closure below a level of significance; each technical condition of certification also includes one or more verification provisions that describe the means of assuring that the condition has been satisfied.

REVISED COMPLIANCE CONDITIONS

Recent compliance monitoring experience has demonstrated the need to revise the Compliance Conditions of Certification to improve compliance enforcement. These new conditions are now being proposed for all new projects at the Energy Commission and

have been included as part of this ESPFM amendment to be consistent with current definitions and current compliance enforcement policies. The list below summarizes the revisions.

- Definitions for specific terms pertinent to compliance monitoring, including, “Start of Construction,” “Start of Commercial Operation,” “Non-Operation and Closure,” “Site Assessment and Pre-Construction Activities,” and “Site Mobilization and Construction,” among others;

- A new subsection and expanded discussion of “Roles and Responsibilities” and new sections for “Pre-Construction and Pre-Operation Compliance Meeting” and “Energy Commission Record;” and

- New condition of certification addressing “Non-Operation” and “Facility Closure Planning.”

Specifically the following condition changes have been made:

- **Compliance-1** through **Compliance-9,** have been renamed **COM-1** through **COM-9** and the language has been updated to reflect new definitions and compliance enforcement policies.

- **COM-10** (Amendments, Staff-Approved Project Modifications, Ownership Changes, and Verification Changes), replaces old **Compliance-14** (Amendments, Ownership Changes, Staff Approved Project Modifications and Verification Changes).

- **COM-11** (previously **Compliance-10**), has been updated to incorporate a number of administrative changes to reporting complaints, notices and citations.

- **COM-12** (Emergency Response Site Contingency Plan), is a new condition requiring a Contingency Plan for emergency response for a number of foreseeable emergency events.

- **COM-13** (Incident-Reporting Requirements), is also a new condition requiring the project owner to notify the CPM within one hour of any serious event, as defined by the condition.

- **COM-14** (Non-Operation) and **COM-15** (Facility Closure Planning), replaces **Compliance-11** (Compliance Conditions for Facility Closure), **Compliance-12** (Unplanned temporary closure/On site Contingency Plan), and **Compliance-13** (Unplanned Permanent Closure/On site Contingency Plan).

KEY PROJECT EVENT DEFINITIONS

The following terms and definitions help determine when various conditions of certification are implemented.

PROJECT CERTIFICATION

Project certification occurs on the day the Energy Commission dockets its Decision after adopting it at a publically noticed Business Meeting or hearing. At that time, all Energy Commission conditions of certification become binding on the project owner and the proposed facility.

SITE ASSESSMENT AND PRE-CONSTRUCTION ACTIVITIES

The below-listed site assessment and pre-construction activities may be initiated or completed prior to the start of construction, subject to the CPM's approval of the specific site assessment or pre-construction activities.

Site assessment and pre-construction activities include the following, but only to the extent the activities are minimally disruptive to soil and vegetation and shall not affect listed or special-status species or other sensitive resources:

1. The installation of environmental monitoring equipment;
2. A minimally invasive soil or geological investigation;
3. A topographical survey;
4. Any other study or investigation to determine the environmental acceptability or feasibility of the use of the site for any particular facility; and
5. Any minimally invasive work to provide safe access to the site for any of the purposes specified in 1-4, above.

SITE MOBILIZATION AND CONSTRUCTION

When a condition of certification requires the project owner to take an action or obtain CPM approval prior to the start of construction, or within a period of time relative to the start of construction, that action must be taken, or approval must be obtained, prior to any site mobilization or construction activities, as defined below.

Site mobilization and construction activities are those necessary to provide site access for construction mobilization and facility installation, including both temporary and permanent equipment and structures, as determined by the CPM.

Site mobilization and construction activities include, but are not limited to:

1. Ground disturbance activities like grading, boring, trenching, leveling, mechanical clearing, grubbing, and scraping;

2. Site preparation activities, such as access roads, temporary fencing, trailer and utility installation, construction equipment installation and storage, equipment and supply laydown areas, borrow and fill sites, temporary parking facilities, and chemical spraying and controlled burns; and

3. Permanent installation activities for all facility and linear structures, including access roads, fencing, utilities, parking facilities, equipment storage, mitigation and landscaping activities, and other installations, as applicable.

SYSTEM COMMISSIONING AND DECOMMISSIONING

Commissioning activities are designed to test the functionality of a facility's installed components and systems to ensure safe and reliable operation. Although decommissioning is often synonymous with facility closure, specific decommissioning activities also systematically test the removal of such systems to ensure a facility's safe closure. For compliance monitoring purposes, commissioning examples include interface connection and utility pre-testing, "cold" and "hot" electrical testing, system pressurization and optimization tests, grid synchronization, and combustion turbine "first fire." Decommissioning activity examples include utility shut down, system depressurization and de-electrification, structure removal, and site reclamation.

START OF COMMERCIAL OPERATION

For compliance monitoring purposes, "commercial operation" or "operation" begins once commissioning activities are complete, the certificate of occupancy has been issued, and the power plant has reached reliable steady-state electrical production. At the start of commercial operation, plant control is usually transferred from the construction manager to the plant operations manager. Operation activities can include a steady state of electrical production, or, for "peaker plants," a seasonal or on-demand operational regime to meet peak load demands.

NON-OPERATION AND CLOSURE

Non-operation is time-limited and can encompass part or all of a facility. Non-operation can be a planned event, usually for minor equipment maintenance or repair, or unplanned, usually the result of unanticipated events or emergencies.

Closure is a facility shutdown with no intent to restart operation. It may also be the cumulative result of unsuccessful efforts to re-start over an increasingly lengthy period of non-operation, condemned by inadequate means and/or lack of a viable plan. Facility closures can occur due to a variety of factors, including, but not limited to, irreparable damage and/or functional or economic obsolescence.

ROLES AND RESPONSIBILITIES

Provided below is a generalized description of the compliance roles and responsibilities for Energy Commission staff (staff) and the project owner for the construction and operation of the ESEC.

COMPLIANCE PROJECT MANAGER RESPONSIBILITIES

The CPM's compliance monitoring and project oversight responsibilities include:

- Ensuring that the design, construction, operation, and closure of the project facilities are in compliance with the terms and conditions of the Decision;
- Resolving complaints;

- Processing post-certification project amendments for changes to the project description, conditions of certification, ownership or operational control, and requests for extension of the deadline for the start of construction;
- Documenting and tracking compliance filings; and
- Ensuring that compliance files are maintained and accessible.

The CPM is the central contact person for the Energy Commission during project pre-construction, construction, emergency response, operation, and closure. The CPM shall consult with the appropriate responsible parties when handling compliance issues, disputes, complaints, and amendments.

All project compliance submittals are submitted to the CPM for processing. Where a submittal requires CPM approval, the approval shall involve appropriate Energy Commission technical staff and management. All submittals must include searchable electronic versions (.pdf, MS Word, or equivalent files).

Pre-Construction and Pre-Operation Compliance Meeting

The CPM usually schedules pre-construction and pre-operation compliance meetings prior to the projected start-dates of construction, plant operation, or both. These meetings are used to assist the Energy Commission and the project owner's technical staff in the status review of all required pre-construction or pre-operation conditions of certification, and take proper action if outstanding conditions remain. In addition, these meetings ensure, to the extent possible, that the Energy Commission's conditions of certification do not delay the construction and operation of the plant due to last-minute unforeseen issues or a compliance oversight. 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 maintains the following documents and information as public records, in either the Compliance files or Dockets files, for the life of the project (or other period as specified):

- All documents demonstrating compliance with any legal requirements relating to the construction, operation, and closure of the facility;
- All Monthly and Annual Compliance Reports (MCRs, ACRs) filed by the project owner;
- All project-related complaints of alleged noncompliance filed with the Energy Commission; and
- All petitions for project or condition of certification changes and the resulting staff or Energy Commission action.

CHIEF BUILDING OFFICIAL DELEGATION AND AGENCY COOPERATION

Under the California Building Standards Code, while monitoring project construction and operation, staff acts as, and has the authority of, the Chief Building Official (CBO). Staff may delegate some CBO responsibility to either an independent third-party contractor or a local building official. However, staff retains CBO authority when selecting a delegate CBO, including the interpretation and enforcement of state and local codes and the use of discretion, as necessary, in implementing the various codes and standards.

The delegate CBO will also be responsible to facilitate compliance with all environmental conditions of certification, including cultural resources, and the implementation of all appropriate codes and standards and Energy Commission requirements. The CBO will conduct on-site (including linear facilities) reviews and inspections at intervals necessary to fulfill those responsibilities. The project owner will pay all delegate CBO fees necessary to cover the costs of these reviews and inspections.

PROJECT OWNER RESPONSIBILITIES

The project owner is responsible for ensuring that all conditions of certification in the Energy Commission's ESEC Decision are satisfied. The project owner shall submit all compliance submittals to the CPM for processing unless the conditions specify another recipient. The Compliance Conditions of Certification regarding post-certification changes specify measures that the project owner must take when modifying the project's design, operation, or performance requirements, or to transfer ownership or operational control. Failure to comply with any of the conditions of certification may result in a correction order, an administrative fine, certification revocation, or any combination thereof, as appropriate. A summary of the Compliance Conditions of Certification are included as **Compliance Conditions Table 1** at the end of this section.

COMPLIANCE ENFORCEMENT

The Energy Commission's legal authority to enforce the terms and conditions of its Decision are specified in Public Resources Code sections 25534 and 25900. The Energy Commission may amend or revoke a project certification and may impose a civil penalty for any significant failure to comply with the terms or conditions of the Decision. The Energy Commission's actions and fine assessments would take into account the specific circumstances of the incident(s).

PERIODIC COMPLIANCE REPORTING

Many of the conditions of certification require submittals in the MCRs and ACRs. All compliance submittals assist the CPM in tracking project activities and monitoring compliance with the terms and conditions of the ESEC Decision. During construction, the project owner or an authorized agent shall submit compliance reports on a monthly basis. During operation, compliance reports are submitted annually, except as

otherwise required. These reports and the requirements for an accompanying compliance matrix are described below.

NONCOMPLIANCE COMPLAINT PROCEDURES

Any person or agency may file a complaint alleging noncompliance with the conditions of certification. Such a complaint shall be subject to review by the Energy Commission pursuant to Title 20, California Code of Regulations, section 1237, but, in many instances, the issue(s) can be resolved by using an informal dispute resolution process. Both the informal and formal complaint procedures, as described in current state law and regulations, are summarized below. Energy Commission staff shall follow these provisions unless superseded by future law or regulations. The California Office of Administrative Law provides on-line access to the California Code of Regulations at http://www.oal.ca.gov/.

Informal Dispute Resolution Process

The following informal procedure is designed to resolve code and compliance interpretation disputes stemming from the project's conditions of certifications and other LORS. The project owner, the Energy Commission, or any other party, including members of the public, may initiate the informal dispute resolution process. Disputes may pertain to actions or decisions made by any party, including the Energy Commission's delegate agents.

This process may precede the formal complaint and investigation procedure specified in Title 20, California Code of Regulations, section 1237, but is not intended to be a prerequisite or substitute for it. This informal procedure may not be used to change the terms and conditions of certification in the Decision, although the agreed-upon resolution may result in a project owner proposing an amendment. The informal dispute resolution process encourages all parties to openly discuss the conflict and reach a mutually agreeable solution. If a dispute cannot be resolved, then the matter must be brought before the full Energy Commission for consideration via the complaint and investigation procedure specified in Title 20, California Code of Regulations, section 1237.

Request for Informal Investigation

Any individual, group, or agency may request that the CPM conduct an informal investigation of alleged noncompliance with the Energy Commission's conditions of certification. Upon receipt of an informal investigation request, the CPM shall promptly provide both verbal and written notification to the project owner of the allegation(s), along with all known and relevant information of the alleged noncompliance. The CPM shall evaluate the request and, if the CPM determines that further investigation is necessary, shall ask the project owner to promptly conduct a formal inquiry into the matter and provide within seven days a written report of the investigation results, along with corrective measures proposed or undertaken. Depending on the urgency of the matter, the CPM may conduct a site visit and/or request that the project owner provide an initial verbal report within 48 hours.

Request for Informal Meeting

In the event that either the requesting party or Energy Commission staff are not satisfied with the project owner's investigative report or corrective measures, either party may submit a written request to the CPM for a meeting with the project owner. The request shall be made within 14 days of the project owner's filing of the required investigative report. Upon receipt of such a request, the CPM shall attempt to:

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; and
3. Conduct the meeting in an informal and objective manner so as to encourage the voluntary settlement of the dispute in a fair and equitable manner.

After the meeting, the CPM shall promptly prepare and distribute copies to all parties, and to the project file, of a summary memorandum that fairly and accurately identifies the positions of all parties and any understandings reached. If no agreement was reached, the CPM shall direct the complainant to the formal complaint process provided under Title 20, California Code of Regulations, section 1237.

Formal Dispute Resolution Procedure

Any person may file a complaint with the Energy Commission's Dockets Unit alleging noncompliance with a Commission Decision adopted pursuant to Public Resources Code section 25500. Requirements for complaint filings and a description of how complaints are processed are provided in Title 20, California Code of Regulations, section 1237.

POST-CERTIFICATION CHANGES TO THE ENERGY COMMISSION DECISION

The project owner must petition the Energy Commission pursuant to Title 20, California Code of Regulations, section 1769, to modify the design, operation, or performance requirements of the project and/or the linear facilities, or to transfer ownership or operational control of the facility. **It is the responsibility of the project owner to contact the CPM to determine if a proposed project change should be considered a project modification pursuant to section 1769.** Implementation of a project modification without first securing Energy Commission approval may result in an enforcement action including civil penalties in accordance with Public Resources Code, section 25534.

Below is a summary of the criteria for determining the type of approval process required, reflecting the provisions of Title 20, California Code of Regulations, section 1769, at the time this Compliance Plan was drafted. If the Energy Commission modifies this regulation, the language in effect at the time of the requested change shall apply. Upon request, the CPM can provide sample formats of these submittals.

AMENDMENT

The project owner shall submit a Petition to Amend the Energy Commission Decision, pursuant to Title 20, California Code of Regulations, section 1769 (a), when proposing modifications to the design, operation, or performance requirements of the project and/or the linear facilities. If a proposed modification results in an added, changed, or deleted condition of certification, or makes changes causing noncompliance with any applicable LORS, the petition shall be processed as a formal amendment to the Decision, triggering public notification of the proposal, public review of the Energy Commission staff's analysis, and consideration of approval by the full Energy Commission.

CHANGE OF OWNERSHIP AND/OR OPERATIONAL CONTROL

Change of ownership or operational control also requires that the project owner file a petition pursuant to section 1769 (b). This process requires public notice and approval by the full Commission. The petition shall be in the form of a legal brief and fulfill the requirements of section 1769 (b).

STAFF-APPROVED PROJECT MODIFICATION

Modifications that do not result in additions, deletions, or changes to the conditions of certification, that are compliant with the applicable LORS, and have no significant environmental impacts, may be authorized by the CPM as a staff-approved project modification pursuant to section 1769 (a) (2). Once the CPM files a Notice of Determination of the proposed project modifications, any person may file an objection to the CPM's determination within 14 days of service on the grounds that the modification does not meet the criteria of section 1769 (a) (2). If there is a valid objection to the CPM's determination, the petition must be processed as a formal amendment to the Decision and must be considered for approval by the full Commission at a publically noticed Business Meeting or hearing.

VERIFICATION CHANGE

Each condition of certification (except for the **Compliance** Conditions) has one or more means of verifying the project owner's compliance with the provisions of the condition. These verifications specify the actions and deadlines by which a project owner demonstrates compliance with the Energy Commission-adopted conditions. A verification may be modified by the CPM without requesting an amendment to the Energy Commission Decision, if, the change does not conflict with any condition of certification, does not violate any LORS, and provides an effective alternative means of verification.

EMERGENCY RESPONSE CONTINGENCY PLANNING AND INCIDENT REPORTING

To protect public health and safety and environmental quality, the conditions of certification include contingency planning and incident reporting requirements to ensure compliance with necessary health and safety practices. A well-drafted contingency plan

avoids or limits potential hazards and impacts resulting from serious incidents involving personal injury, hazardous spills, flood, fire, explosions or other catastrophic events and ensures a comprehensive timely response. All such incidents must be reported immediately to the CPM and documented. These requirements are designed to build from “lessons learned”, limit the hazards and impacts, anticipate and prevent recurrence, and provide for the safe and secure shutdown and re-start of the facility.

FACILITY CLOSURE

The Energy Commission cannot reasonably foresee all potential circumstances in existence when a facility permanently closes. Therefore, the closure conditions provided herein strive for the flexibility to address circumstances that may exist at some future time. Most importantly, facility closure must be consistent with all applicable Energy Commission conditions of certification and the LORS in effect at that time.

Although a non-operational facility may intend to resume operations, if it remains non-operational for longer than one year and the project owner does not present a viable plan to resume operation, the Energy Commission can conclude that closure is imminent and direct the project owner to commence closure preparations. Should the project owner effectively abandon a facility, the Energy Commission can access the required financial assurance funds to begin closure, but the owner remains liable for all associated costs.

Prior to submittal of the facility’s Final Closure Plan to the Energy Commission, the project owner and the CPM will hold a meeting to discuss the specific contents of the plan. In the event that significant issues are associated with the plan's approval, the CPM will hold one or more workshops and/or the Commission may hold public hearings as part of its approval procedure.

With the exception of measures to eliminate any immediate threats to public health and safety or to the environment, facility closure activities cannot be initiated until the Energy Commission approves the Final Closure Plan and Cost Estimate and the project owner complies with any requirements the Commission may incorporate as conditions of approval of the Final Closure Plan.

RESPONSE TO AGENCY AND PUBLIC COMMENTS

<u>Comments from the Project Owner:</u>

The project owners made comments on Compliance Conditions of Certification **COM-10**, **COM-15**, and **COM-16**. Staff is addressing **COM-15** and **COM-16** together since they are related topics.

1. Project Owner does not understand the basis for, nor the exact scope of, new proposed Condition of Certification **COM-10** (Amendments, Staff-Approved Project Modification, Ownership changes, and Verification Changes) and requests further explanation as to what constitutes a change in ownership of a project and why a

COC would be needed to specify an existing legal obligation under the Warren Alquist Act.

2. For Condition of Certifications **COM-15** (Facility Closure Planning) and **COM-16** (Financial Assurance for Closure and Post-Closure Care), the project owner states that these two conditions require significant capital be tied up for an indefinite period of time, for the life the Project, in order to set aside funds for some unclear and long-in-the-future decommissioning process. The project owner does not agree that at this time with a premise that decommission costs can be predicted so far in advance or very precisely.

   Project Owner believes that such significant changes in requirements are better suited to a rulemaking, where all interested parties can participate in a meaningful dialogue regarding a new approach to decommissioning under the Warren Alquist Act.

Staff Response:

1. **COM-10** (Amendments, Staff-Approved Project Modification, Ownership changes, and Verification Changes) replaces the old standard condition **Compliance-14** used in prior amendments to this power plant (Amendments, Ownership changes, Staff Approved Project Modification and Verification Changes). **COM-10** is an administrative change to update the standard condition into the Energy Commission's new wording and format used on current siting cases and amendments. A change of ownership or operational control requires that the project owner file a petition to transfer ownership or operational control of a facility pursuant to Title 20, California Code of Regulations, section 1769(b). A change in ownership is constituted by the project owner's petition. The project owner's petition shall discuss any facts supporting a change in ownership of a project, including but not limited to, any significant changes in the operational relationship between the owner and operator; identifying the party responsible for compliance with the commission's conditions of certification; and verification by the new owner or operator. The petition is a legal brief and must fulfill the requirements of 1769(b) in order to establish an ownership or operational control change. The petition process requires public notice and approval by the full Commission. This condition of certification is standard and necessary to address when the project owner must petition the Energy Commission pursuant to Title 20, California Code of Regulations, sections 1769(a) and (b) for Post Certification Amendments and Changes to the Energy Commission Decision.

2. **COM-15** (Facility Closure Plan) replaces **Compliance-11** (Compliance Conditions for Facility Closure) and was previously required in the license for this project. Modifications were made to this condition to further clarify the procedures for the Facility Closure Plan. Staff removed references to **COM-16** that relate to Financial Assurance for Closure and Post-Closure Care, since COM-16 is no longer a required condition of certification.

Staff agrees with the Petitioner's objection and has removed **COM-16** (Financial Assurance for Closure and Post-Closure Care) from the proposed conditions of certification.

COMPLIANCE CONDITIONS OF CERTIFICATION

For the ESPFM, staff proposes the **Compliance** Conditions of Certification below. **Compliance-1** through **Compliance-9** have been renamed **COM-1** through **COM-9** and the language had been updated to reflect new definitions and compliance enforcement policies. **COM-10** (Amendments, Staff-Approved Project Modification, Ownership changes, and Verification Changes) replaces old **Compliance-14** (Amendments, Ownership changes, Staff Approved Project Modification and Verification Changes). **COM-11** (previously **Compliance-10**) has been updated to incorporate a number of administrative changes to reporting complaints, notices and citations. **COM-12** (Emergency Response Site Contingency Plan), is a new condition requiring a Contingency Plan for emergency response for a number of foreseeable emergency events. **COM-13** (Incident-Reporting Requirements) is also a new condition requiring the project owner to notify the CPM within one hour of any serious event, as defined by the condition, occur. **COM-14** (Non-Operation) and **COM-15** (Facility Closure Planning) replaces **Compliance-11** (Compliance Conditions for Facility Closure), **Compliance-12** (Unplanned temporary closure/On site Contingency Plan), and **Compliance-13** (Unplanned Permanent Closure/On site Contingency Plan). (Revisions are in ~~strikeout~~ or **bold underline.**)

COM-1: **~~(Compliance-1)~~**Unrestricted Access**.** **The project owner shall take all steps necessary to ensure that t**he CPM, responsible Energy Commission staff, and delegated agencies or consultants ~~shall be guaranteed and granted~~ **have** 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 **shall** ~~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~~.~~ **, whether such visits are by the CPM in person or through representatives from Energy Commission staff, delegated agencies, or consultants.**

COM-2: **~~(Compliance-2)~~** Compliance Record**.** The project owner shall maintain **electronic copies of all** project files **and submittals** on-site**,** or at an alternative site approved by the CPM**,** for the **operational** life **and closure** of the project~~,~~**.** ~~unless a lesser period of time is specified by the conditions of certification.~~ The files shall **also** contain **at least one hard copy of:** ~~copies of all "as-built" drawings, documents submitted as verification for conditions, and other project-related documents.~~

1. **The facility's Application(s) for Certification;**
2. **all amendment petitions and Energy Commission orders;**

3. **All site-related environmental impact and survey documentation;**
4. **All appraisals, assessments, and studies for the project;**
5. **All finalized original and amended structural plans and "as-built" drawings for the entire project;**
6. **All citations, warnings, violations, or corrective actions applicable to the project, and**
7. **The most current versions of any plans, manuals and training documentation required by the conditions of certification or applicable LORS.**

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

~~Compliance Verification Submittals (COMPLIANCE-3)~~

~~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.~~

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

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

~~Verification lead times 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 project by AFC number, the appropriate condition(s) of certification by condition number(s), and 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 and CEC submittal number.~~

~~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 hardcopy submittals shall be addressed as follows:~~

~~**Joseph Douglas, CPM**~~
~~**(00-AFC-14C)**~~
~~**California Energy Commission**~~
~~**1516 Ninth Street (MS-2000)**~~
~~**Sacramento, CA 95814**~~

~~Those submittals shall be accompanied by a searchable electronic copy, on a CD or by e-mail, as agreed upon by the CPM.~~

~~If the project owner desires Energy Commission staff action by a specific date, that request shall be made in the submittal cover letter and shall include a detailed explanation of the effects on the project if that date is not met.~~

COM-3: ~~**(Compliance-3)**~~ Compliance Verification Submittals~~.~~ ~~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.~~

Verification lead times associated with the start of construction or closure may require the project owner to file submittals during the AFC process, particularly if construction is planned to commence shortly after certification. The verification procedures, unlike the conditions, may be modified as necessary by the CPM.

A cover letter from the project owner or an authorized agent is required for all compliance submittals and correspondence pertaining to compliance matters. The cover letter subject line shall identify the project by AFC number, cite the appropriate condition(s) of certification number(s), and give a brief description of the subject of the submittal. When submitting supplementary or corrected information, the project owner shall reference the date of the previous submittal and the condition(s) of certification applicable.

All reports and plans required by the project's conditions of certification shall be submitted in a searchable electronic format (.pdf, MS Word, or Excel, etc.) and include standard formatting elements such as a table of contents, identifying by title and page number each section, table, graphic, exhibit, or addendum. All report and/or plan graphics and maps shall be adequately scaled and shall include a key with descriptive labels, directional headings, a bar scale, and the most recent revision date.

The project owner is responsible for the content and delivery of all verification submittals to the CPM, whether the actions required by the verification were satisfied by the project owner or an agent of the project owner. All submittals shall be accompanied by an electronic copy on an electronic storage medium, or by e-mail, as agreed upon by the CPM. If hard-copy submittals are required, please address as follows:

Compliance Project Manager
El Segundo Energy Center (00-AFC-14C)
California Energy Commission
1516 Ninth Street (MS-2000)
Sacramento, CA 95814

~~Those submittals shall be accompanied by a searchable electronic copy, on a CD or by e-mail, as agreed upon by the CPM.~~

COM-4: **~~(Compliance-4)~~** Pre-Construction Matrix and Tasks Prior to Start of Construction**.** Prior to ~~commencing~~ **start of** construction, **the project owner shall submit to the CPM** a compliance matrix ~~addressing~~ **including** only those conditions that must be fulfilled before the start of construction**.** ~~shall be submitted by the project owner to the CPM.~~ Th**e~~is~~** matrix **shall** ~~will~~ be included with the project owner's first compliance submittal or prior to the first pre-construction meeting, whichever comes first**, and shall be submitted in a format similar to the description below**. ~~It will be submitted in the same format as the compliance matrix described below.~~

Site mobilization and ~~C~~**c**onstruction **activities** shall not **start** ~~commence~~ until **all of following occur: project owner has submitted the pre-construction matrix and all submittals required by compliance verifications pertaining to all pre-construction conditions of certification, and the CPM has issued an authorization-to-construct letter to the project owner. The deadlines for submitting various compliance verifications to the CPM allow sufficient staff time to review and comment on, and if necessary, allow the project owner to revise the submittal in a timely manner. These procedures help ensure that project construction proceeds according to schedule. Failure to submit required compliance documents by the specified deadlines may result in delayed authorizations to commence various stages of the project.** ~~the pre-construction matrix is submitted, all preconstruction conditions have been complied with, and the CPM has issued a letter to the project owner authorizing construction. Various lead times for submittal of compliance verification documents to the CPM for conditions of certification are established to allow sufficient staff time to review and comment and, if necessary, allow the project owner to revise the submittal in a timely manner. This will ensure that project construction may proceed according to schedule. Failure to submit compliance documents within the specified lead-time may~~

~~result in delays in authorization to commence various stages of project development.~~

If the project owner anticipates **site mobilization immediately following project certification** ~~commencing project construction as soon as the project is certified~~, it may be necessary for the project owner to file compliance submittals prior to project ~~c~~certification. **In these instances,** ~~C~~**c**ompliance **verifications can be submitted** ~~submittals should be completed~~ in advance **of the required deadlines and the anticipated authorizations to start construction.** ~~where the necessary lead time for a required compliance event extends beyond the date anticipated for start of construction.~~ The project owner must understand that ~~the submittal of compliance documents~~ **submitting compliance verification requirements** prior to ~~certification~~ **these authorizations** is at the owner's own risk. Any approval by Energy Commission staff **prior to project certification** is subject to change, based upon the Commission Decision~~.~~ **, or amendment thereto, and early staff compliance approvals do not imply that the Energy Commission will certify the project for actual construction and operation.**

~~Compliance Reporting~~

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

COM-5: ~~**(Compliance-5)**~~ Compliance Matrix**.** ~~A compliance matrix shall be submitted by the project owner to the CPM along with each monthly and annual compliance report.~~ **The project owner shall submit a compliance matrix to the CPM with each MCR and ACR.** The compliance matrix ~~is intended~~ provide**s** the CPM with **the** ~~current~~ status of all conditions of certification in a spreadsheet format. **The compliance matrix** ~~must~~ **shall identify:**

1. The technical area **(e.g., biological resources, facility design, etc.);**
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., sixty **(**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. If the condition was amended**, the updated language and** the date the amendment **was proposed or approved.**

~~Satisfied conditions shall be placed at the end of the matrix.~~ **The CPM can provide a template for the compliance matrix upon request.**

COM-6: **~~(Compliance-6)~~** Monthly Compliance Reports **and Key Events List.** The first Monthly Compliance Report **(MCR)** is due one**(1)** month following the **docketing of the project's Decision** ~~Energy Commission business meeting date upon which the project was approved,~~ unless otherwise agreed to by the CPM. The first **MCR** ~~Monthly Compliance Report~~ shall include the AFC number and an initial list of dates for each of the events identified on the **Key Events List. (**The Key Events List form is found at the end of **~~these General Conditions~~ this Compliance Plan).**

During pre-construction**,** ~~and~~ construction**, or closure** ~~of the project~~, the project owner or authorized agent shall submit an ~~original and an~~ electronic searchable version of the ~~Monthly Compliance Report~~ **MCR** within **ten (**10**)** working days after the end of each reporting month **, unless otherwise specified by the CPM**. ~~Monthly Compliance Reports~~ **MRCs** shall be clearly identified for the month being reported. **The searchable electronic copy may be filed on an electronic storage medium or by e-mail, subject to CPM approval.** The **compliance verification submittal condition provides guidance on report production standards, and the MCR** ~~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~~ **MRC;**~~.~~ E**e**ach of these items must be identified in the transmittal letter, as well as the conditions they satisfy**,** and submitted as attachments to the **MCR**~~Monthly Compliance Report~~;

3. An initial, and thereafter updated, compliance matrix showing the status of all conditions of certification;

4. A list of conditions that have been satisfied during the reporting period, and a description or reference to the actions that satisfied the condition;

5. A list of any submittal deadlines that were missed, accompanied by an explanation and an estimate of when the information will be provided;

6. A cumulative listing of any approved changes to the conditions of certification;

7. A list of any filings submitted to, and permits issued by, other governmental agencies during the month;

8. A projection of project compliance activities scheduled during the next two months~~.~~ **;** ~~T~~**t**he project owner shall notify the CPM as soon as any changes are made to the project construction schedule that would affect compliance with conditions of certification;

9. A list~~ing~~ of the month's additions to the on-site compliance file; and

10. A listing of complaints, notices of violation, official warnings, and citations received during the month~~,~~ **;** a description of the ~~resolution of the resolved~~ actions taken to date to resolve the issues~~,~~ **;** and the status of any unresolved actions.

~~All sections, exhibits, or addendums shall be separated by tabbed dividers or as acceptable by the CPM.~~

COM-7: ~~**(Compliance-7)**~~ Annual Compliance Reports**.** After construction is complete, the project owner shall submit ~~-~~**searchable electronic** Annual Compliance Reports **(ACR)s** instead of **MCRs** ~~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.~~ **ACRs are due for each year of commercial operation and may be required for a specified period after decommissioning to monitor closure compliance, as specified by the CPM. The searchable electronic copies may be filed on an electronic storage medium or by e-mail, subject to CPM approval.** Each ~~Annual Compliance Report~~ **ACR** ~~shall~~ **must** include the AFC number, identify the reporting period, and ~~shall~~ contain the following:

1. An updated compliance matrix showing the status of all conditions of certification (fully satisfied conditions do not need to be included in the matrix after they have been reported as completed);

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.~~**ACR;** ~~E~~each of these items shall be identified in the transmittal letter with the condition it satisfies and submitted as an attachment to the ~~Annual Compliance Report~~ **ACR;**

4. A cumulative list 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 list of filings submitted to, and permits issued by, other governmental agencies during the year;

7. A projection of project compliance activities scheduled during the next year;

8. A list of the year's additions to the on-site compliance file;

9. An evaluation of the ~~s~~**S**ite ~~c~~**C**ontingency ~~p~~**P**lan ~~for unplanned facility closure~~, including ~~any suggestions necessary for bringing the plan up to date (see Compliance Conditions for Facility Closure addressed later in this section);~~ **amendments and plan updates**; and

10. A list of complaints, notices of violation, official warnings, and citations received during the year, a description of ~~resolution of any resolved matters~~ **how the issues were resolved,** and the status of any unresolved matters.

COM-8: **~~(Compliance-8)~~** Confidential Information**.** Any information that the project owner ~~deems~~ **designates as** confidential shall be submitted to the Energy Commission's Executive Director with an application for confidentiality, pursuant to Title 20, California Code of Regulations, section 2505(a). **Any information** ~~determined to be~~ **deemed** confidential **pursuant to the regulations** shall ~~be kept confidential as provided for in~~ **remain undisclosed, as provided in** Title 20, California Code of Regulations, section 2501~~, et. seq~~.

COM-9: **~~(Compliance-9)~~** Annual Energy Facility Compliance Fee**.** Pursuant to the provisions of section 25806 (b) of the Public Resources Code, the project owner is required to pay an annual**ly adjusted** compliance fee ~~which is adjusted annually.~~**.** Current ~~C~~**c**ompliance fee information is available on the Energy Commission's website at http://www.energy.ca.gov/siting/filing_fees.html. **The project owner may also contact the CPM for the current fee information.** The initial payment is due on the date **the Energy Commission dockets its final Decision** ~~of the Business Meeting at which the Energy Commission adopts the final decision~~. All subsequent payments are due by July 1 of each year in which the facility retains its certification. ~~The payment instrument shall be made payable to the California Energy Commission and mailed to: Accounting Office MS-02, California Energy Commission, 1516 9th St., Sacramento, CA 95814.~~

COM-10: **Amendments, Staff-Approved Project Modifications, Ownership Changes, and Verification Changes. The project owner shall petition the Energy Commission, pursuant to Title 20, California Code of Regulations, section 1769, to modify the design, operation, or performance requirements of the project or linear facilities, and to transfer ownership or operational control of the facility. It is the project owner's responsibility to contact the CPM to determine if a proposed**

project change is a project modification pursuant to the requirements of section 1769. Section 1769 details the required contents for a Petition to Amend an Energy Commission Decision. The only change that can be requested by means of a letter to the CPM is a request to change the verification method of a condition of certification.

Implementation of a project modification without first securing Energy Commission, or Energy Commission staff, approval, may result in an enforcement action, including civil penalties, in accordance with section 25534 of the Public Resources Code. If the Energy Commission's rules regarding amendments are revised, the rules in effect at the time the change is requested shall apply.

COM-11: ~~**(Compliance-10)**~~ Reporting of Complaints, Notices, and Citations**.** Prior to the start of construction **or decommissioning**, the project owner ~~must~~ **shall** send a letter to property owners within one **(1)** 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 **twenty-four (**24**)** hours per day, it shall include automatic answering with a date and time stamp recording. ~~All recorded complaints shall be responded to within 24 hours.~~

The project owner shall respond to all recorded complaints within twenty-four (24) hours or the next business day. The ~~telephone number shall be~~ **project site shall** post~~ed at~~ the **telephone number on-site** ~~project site~~ and easily visible to a passersby during construction**,** ~~and~~ operation **and closure**. The **project owner shall provide the contact information to 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~~. **http://www.energy.ca.gov/sitingcases/elsegundo/**

~~Any changes to the telephone number shall be submitted immediately to the CPM, who will update the web page.~~

The project owner shall report any disruption to the contact system or telephone number change to the CPM promptly, to allow the CPM to update the Energy Commission's facility webpage accordingly.

In addition to **all complaints, notices, and citations included with the MCRs and ACRs, within ten (10) days of receipt, the project owner shall report, and provide copies to the CPM, of all complaints, including noise and lighting complaints, notices of violation, notices of fines, official warnings, and citations.** ~~the monthly and annual compliance reporting requirements described above, the project owner shall report and provide copies to the CPM of all complaint forms, including noise and lighting complaints, notices of violation, notices of fines, official warnings, and citations within 10 days of receipt.~~ Complaints shall be logged and numbered.

Noise complaints shall be recorded on the form provided in the **NOISE and VIBRARATION**-conditions of certification. All other complaints shall be recorded on the complaint form (Attachment A) **at the end of this Compliance Plan**.

~~COMPLIANCE CONDITIONS FOR FACILITY CLOSURE~~ Planned Closure (COMPLIANCE-11)

~~In order to ensure that a planned facility closure does not create adverse impacts, a closure process that provides for careful consideration of available options and applicable laws, ordinances, regulations, standards, and local/regional plans in existence at the time of closure will be undertaken. To ensure adequate review of a planned project closure, the project owner shall submit a proposed facility closure plan to the Energy Commission for review and approval at least 12 months (or other period of time agreed to by the CPM) prior to the commencement of closure activities. The project owner shall file 120 copies (or other number of copies agreed upon by the CPM) of a proposed facility closure plan with the Energy Commission.~~

~~The plan shall:~~

1. ~~identify and discuss any impacts and mitigation to address significant adverse impacts associated with proposed closure activities and to address facilities, equipment, or other project related remnants that will remain at the site;~~
2. ~~identify a schedule of activities for closure of the power plant site, transmission line corridor, and all other appurtenant facilities constructed as part of the project;~~
3. ~~identify any facilities or equipment intended to remain on site after closure, the reason, and any future use; and~~
4. ~~address conformance of the plan with all applicable laws, ordinances, regulations, standards, and local/regional plans in existence at the time of facility closure, and applicable conditions of certification.~~

~~Prior to submittal of the proposed facility closure plan, a meeting shall be held between the project owner and the Energy Commission CPM for the purpose of discussing the specific contents of the plan.~~

~~In the event that there are significant issues associated with the proposed facility closure plan's approval, or if the desires of local officials or interested parties are inconsistent with the plan, the CPM shall hold one or more workshops and/or the Energy Commission may hold public hearings as part of its approval procedure.~~

~~As necessary, prior to or during the closure plan process, the project owner shall take appropriate steps to eliminate any immediate threats to public health and safety and the environment, but shall not commence any other closure activities until the Energy Commission approves the facility closure plan.~~

~~Unplanned Temporary Closure/On-Site Contingency Plan (COMPLIANCE-12)~~

~~In order to ensure that public health and safety and the environment are protected in the event of an unplanned temporary facility closure, it is essential to have an on-site contingency plan in place. The on-site contingency plan will help to ensure that all necessary steps to mitigate public health and safety impacts and environmental impacts are taken in a timely manner.~~

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

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

~~The on-site contingency plan shall provide for taking immediate steps to secure the facility from trespassing or encroachment. In addition, for closures of more than 90 days, unless other arrangements are agreed to by the CPM, the plan shall provide for removal of hazardous materials and hazardous wastes, draining of all chemicals from storage tanks and other equipment, and the safe shutdown of all equipment. (Also see specific conditions of certification for the technical areas of **Hazardous Materials Management** and **Waste Management**)~~

~~In addition, consistent with requirements under unplanned permanent closure addressed below, the nature and extent of insurance coverage, and major equipment warranties must also be included in the on-site contingency plan. In addition, the status of the insurance coverage and major equipment warranties must be updated in the annual compliance reports.~~

~~In the event of an unplanned temporary closure, the project owner shall notify the CPM, as well as other responsible agencies, by telephone, fax, or e-mail, within 24 hours and shall take all necessary steps to implement the on-site contingency plan. The project owner shall keep the CPM informed of the circumstances and expected duration of the closure.~~

~~If the CPM determines that an unplanned temporary closure is likely to be permanent, or for a duration of more than 12 months, a closure plan consistent with the requirements for a planned closure shall be developed and submitted to the CPM within 90 days of the CPM's determination (or other period of time agreed to by the CPM).~~

Unplanned Permanent Closure/On-Site Contingency Plan (COMPLIANCE-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 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.

Post Certification Changes to the Energy Commission Decision:

Amendments, Ownership Changes, Staff Approved Project Modifications and Verification Changes (COMPLIANCE-14)

The project owner must petition the Energy Commission pursuant to Title 20, California Code of Regulations, section 1769, in order to modify the project (including linear facilities) design, operation or performance requirements, and to transfer ownership or operational control of the facility. **It is the responsibility of the project owner to contact the CPM to determine if a proposed project change should be considered a project modification pursuant to section 1769.** Implementation of a project modification without first securing Energy Commission, or Energy Commission staff approval, may result in enforcement action that could result in civil penalties in accordance with section 25534 of the Public Resources Code.

A petition is required for **amendments** and for **staff approved project modifications** as specified below. Both shall be filed as a "Petition to Amend." Staff will determine if the change is significant or insignificant. For verification changes, a letter from the project owner is sufficient. In all cases, the petition or letter requesting a change should be submitted to the CPM, who will file it with the Energy Commission's Dockets Unit in accordance with Title 20, California Code of Regulations, section 1209.

The criteria that determine which type of approval and the process that applies are explained below. They reflect the provisions of Section 1769 at the time

~~this condition was drafted. If the Commission's rules regarding amendments are amended, the rules in effect at the time an amendment is requested shall apply.~~

~~Amendment~~

~~The project owner shall petition the Energy Commission, pursuant to Title 20, California Code of Regulations, Section 1769(a), when proposing modifications to the project (including linear facilities) design, operation, or performance requirements. If a proposed modification results in deletion or change of a condition of certification, or makes changes that would cause the project not to comply with any applicable laws, ordinances, regulations, or standards the petition will be processed as a formal amendment to the final decision, which requires public notice and review of the Energy Commission staff analysis and approval by the full Commission. The petition shall be in the form of a legal brief and fulfill the requirements of Section 1769(a). Upon request, the CPM will provide a sample petition to use as a template.~~

~~Change of Ownership~~

~~Change of ownership or operational control also requires that the project owner file a petition pursuant to section 1769 (b). This process requires public notice and approval by the full Commission. The petition shall be in the form of a legal brief and fulfill the requirements of Section 1769(b). Upon request, the CPM will provide a sample petition to use as a template.~~

~~Staff Approved Project Modification~~

~~Modifications that do not result in deletions or changes to conditions of certification, that are compliant with laws, ordinances, regulations and standards and will not have significant environmental impacts may be authorized by the CPM as a staff approved project modification pursuant to section 1769(a) (2). Once staff files an intention to approve the proposed project modifications, any person may file an objection to staff's determination within 14 days of service on the grounds that the modification does not meet the criteria of section 1769 (a)(2). If a person objects to staff's determination, the petition must be processed as a formal amendment to the decision and must be approved by the full commission at a noticed business meeting or hearing.~~

~~Verification Change~~

~~A verification may be modified by the CPM without requesting an amendment to the decision if the change does not conflict with the conditions of certification and provides an effective alternate means of verification.~~

COM-12: Emergency Response Site Contingency Plan. No less than sixty (60) days prior to the start of commercial operation (or other date agreed to by the CPM), the project owner shall submit for CPM review and approval, an Emergency Response Site Contingency Plan (Contingency

Plan). The Contingency Plan shall evidence a facility's coordinated emergency response and recovery preparedness for a series of reasonably foreseeable emergency events. The CPM may require the updating of the Contingency Plan over the life of the facility. Contingency Plan elements include, but are not limited to:

1. **a site-specific list and direct contact information for persons, agencies, and responders to be notified for an unanticipated event;**
2. **a detailed and labeled facility map, including all fences and gates, the windsock location (if applicable), the on- and off-site assembly areas, and the main roads and highways near the site;**
3. **a detailed and labeled map of population centers, sensitive receptors, and the nearest emergency response facilities;**
4. **a description of the on-site, first response and backup emergency alert and communication systems, site-specific emergency response protocols, and procedures for maintaining the facility's contingency response capabilities, including a detailed map of interior and exterior evacuation routes, and the planned location(s) of all permanent safety equipment;**
5. **an organizational chart including the name, contact information, and first aid/emergency response certification(s) and renewal date(s) for all personnel regularly on-site;**
6. **a brief description of reasonably foreseeable, site-specific incidents and accident sequences (on- and off-site), including response procedures and protocols and site security measures to maintain twenty-four-hour site security;**
7. **procedures for maintaining contingency response capabilities; and**
8. **the procedures and implementation sequence for the safe and secure shutdown of all non-critical equipment and removal of hazardous materials and waste (see also specific conditions of certification for the technical areas of Public Health, Waste Management, Hazardous Materials Management, and Worker Safety).**

COM-13: Incident-Reporting Requirements. Within one (1) hour after it is safe and feasible, the project owner shall notify the CPM or Compliance Office Manager, by telephone and e-mail, of any incident at the power plant or appurtenant facilities that results or could result in any of the following:

1. **Health and safety impacts on the surrounding population;**
2. **Property damage off-site;**

3. **Response by off-site emergency response agencies;**
4. **Serious on-site injury;**
5. **Serious environmental damage; or**
6. **Emergency reporting to any federal, state, or local agency.**

The notice shall describe the circumstances, status, and expected duration of the incident. If warranted, as soon as it is safe and feasible, the project owner shall implement the safe shutdown of any non-critical equipment and removal of any hazardous materials and waste that pose a threat to public health and safety and to environmental quality (also, see specific conditions of certification for the technical areas of Hazardous Materials Management and Waste Management).

Within one (1) week of the incident, the project owner shall submit to the CPM a detailed incident report, which includes, the following information:

1. **A brief description of the incident, including its date, time, and location;**
2. **A description of the cause of the incident, or likely causes if it is still under investigation;**
3. **The location of any off-site impacts;**
4. **Description of any resultant impacts;**
5. **A description of emergency response actions associated with the incident;**
6. **Identification of responding agencies;**
7. **Identification of emergency notifications made to federal, state, and/or local agencies;**
8. **Identification of any hazardous materials released and an estimate of the quantity released;**
9. **A description of any injuries, fatalities, or property damage that occurred as a result of the incident;**
10. **Fines or violations assessed or being processed by other agencies;**
11. **Name, phone number, and e-mail address of the appropriate facility contact person having knowledge of the event; and**
12. **Corrective actions to prevent a recurrence of the incident.**

The project owner shall maintain all incident report records for the life of the project, including closure. After the submittal of the initial report

for any incident, the project owner shall submit to the CPM copies of incident reports within twenty-four (24) hours of a request.

COM-14: Non-Operation. If the facility ceases operation temporarily, either planned or unplanned, for longer than one (1) week (or other CPM-approved date), but less than three (3) months (or other CPM-approved date), the project owner shall notify the CPM, interested agencies, and nearby property owners. Notice of planned non-operation shall be given at least two (2) weeks prior to the scheduled date. Notice of unplanned non-operation shall be provided no later than one (1) week after non-operation begins.

For any non-operation, a Repair/Restoration Plan for conducting the activities necessary to restore the facility to availability and reliable and/or improved performance shall be submitted to the CPM within one (1) week after notice of non-operation is given. If non-operation is due to an unplanned incident, temporary repairs and/or corrective actions may be undertaken before the Repair/Restoration Plan is submitted. The Repair/Restoration Plan shall include:

1. **Identification of operational and non-operational components of the plant;**
2. **A detailed description of the repair or restoration activities;**
3. **A proposed schedule for completing the repair or restoration activities;**
4. **An assessment of whether or not the proposed activities would require changing, adding, and/or deleting any conditions of certification, and/or would cause noncompliance with any applicable LORS; and**
5. **Planned activities during non-operation, including any measures to ensure continued compliance with all conditions of certification and LORS.**

Monthly written updates to the CPM for non-operational periods, until operation resumes, shall include:

1. **Progress relative to the schedule;**
2. **Developments that delayed or advanced progress or that may delay or advance future progress;**
3. **Any public, agency, or media comments or complaints; and**
4. **Projected date for the resumption of operation.**

During non-operation, all applicable conditions of certification and reporting requirements remain in effect. If, after one (1) year from the

date of the project owner's last report of productive Repair/Restoration Plan work, the facility does not resume operation or does not provide a plan to resume operation, the Executive Director may assign suspended status to the facility and recommend commencement of permanent closure activities. Within ninety (90) days of the Executive Director's determination, the project owner shall do one of the following:

1. **If the facility has a closure plan, the project owner shall update it and submit it for Energy Commission review and approval.**

2. **If the facility does not have a closure plan, the project owner shall develop one consistent with the requirements in this Compliance Plan and submit it for Energy Commission review and approval.**

COM-15: Facility Closure Planning. To ensure that a facility's eventual permanent closure and long-term maintenance do not pose a threat to public health and safety and/or to environmental quality, the project owner shall coordinate with the Energy Commission to plan and prepare for eventual permanent closure.

A. Provisional Closure Plan and Estimate of Permanent Closure Costs

To assure satisfactory long-term site maintenance and adequate closure for "the whole of a project," the project owner shall submit a Provisional Closure Plan and Cost Estimate for CPM review and approval within sixty (60) days after the start of commercial operation. The Provisional Closure Plan and Cost Estimate shall consider applicable final closure plan requirements, and reflect the use of an independent third party to carry out the permanent closure.

The Provisional Closure Plan and Cost Estimate shall provide for a phased closure process and include but not be limited to:

1. **Comprehensive scope of work and itemized budget;**

2. **Closure plan development costs;**

3. **Dismantling and demolition;**

4. **Recycling and site clean-up;**

5. **Mitigation and monitoring direct, indirect, and cumulative impacts;**

6. **Site remediation and/or restoration;**

7. **Interim and long term operation monitoring and maintenance, including long-term equipment replacement costs; and**

8. **Contingencies.**

The project owner shall include an updated Provisional Closure Plan and Cost Estimate in every fifth-year ACR for CPM review and approval. Each updated Provisional Closure Plan and Cost Estimate shall reflect the most current regulatory standards, best management practices, and applicable LORS.

B. Final Closure Plan and Cost Estimate

At least three (3) years prior to initiating a permanent facility closure, the project owner shall submit for Energy Commission review and approval, a Final Closure Plan and Cost Estimate, which includes any long-term, post-closure site maintenance and monitoring. Final Closure Plan and Cost Estimate contents include, but are not limited to:

1. ~~a~~ A statement of specific Final Closure Plan objectives;
2. ~~a~~ A statement of qualifications and resumes of the technical experts proposed to conduct the closure activities, with detailed descriptions of previous power plant closure experience;
3. ~~i~~identification of any facility-related installations not part of the Energy Commission certification, designation of who is responsible for these, and an explanation of what will be done with them after closure;
4. ~~a~~ A comprehensive scope of work and itemized budget for permanent plant closure and site maintenance activities, with a description and explanation of methods to be used, broken down by phases, including, but not limited to:
   a. dismantling and demolition;
   b. recycling and site clean-up;
   c. impact mitigation and monitoring;
   d. site remediation and/or restoration and;
   e. any contingencies.
5. ~~a~~ A revised/updated Final Cost Estimate for all closure activities, by phases, including site monitoring and maintenance costs, and long-term equipment replacement;
6. ~~a~~ A schedule projecting all phases of closure activities for the power plant site and all appurtenances constructed as part of the Energy Commission-certified project;
7. ~~a~~ An electronic submittal package of all relevant plans, drawings, risk assessments, and maintenance schedules and/or reports, including an above- and below-ground infrastructure inventory map and registered engineer's or delegate CBO's assessment of demolishing the facility; additionally, for any facility that

permanently ceased operation prior to submitting a Final Closure Plan and Cost Estimate and for which only minimal or no maintenance has been done since, a comprehensive condition report focused on identifying potential hazards;

8. **~~a~~ All information additionally required by the facility's conditions of certification applicable to plant closure;**

9. **~~a~~ An equipment disposition plan, including:**
   a. **recycling and disposal methods for equipment and materials; and**
   b. **identification and justification for any equipment and materials that will remain on-site after closure;**

10. **~~a~~ A site disposition plan, including but not limited to:**
    a. **proposed rehabilitation, restoration, and/or remediation procedures, as required by the conditions of certification and applicable LORS; and**
    b. **site maintenance activities.**

11. **~~i~~Identification and assessment of all potential direct, indirect, and cumulative impacts and proposal of mitigation measures to reduce significant adverse impacts to a less-than-significant level; potential impacts to be considered shall include, but not be limited to:**
    a. **traffic**
    b. **noise and vibration**
    c. **soil erosion**
    d. **air quality degradation**
    e. **solid waste**
    f. **hazardous materials**
    g. **waste water discharges**
    h. **contaminated soil**

12. **~~i~~Identification of all current conditions of certification, LORS, federal, state, regional, and local planning efforts applicable to the facility, and proposed strategies for achieving and maintaining compliance during closure;**

13. **~~u~~Updated mailing list or Listserv of all responsible agencies, potentially interested parties, and property owners within one (1) mile of the facility;**

14. **~~i~~Identification of alternatives to plant closure and assessment of the feasibility and environmental impacts of these; and**

15. **~~D~~description of and schedule for security measures and safe shutdown of all non-critical equipment and removal of hazardous materials and waste (see conditions of certification for Public Health, Waste Management, Hazardous Materials Management, and Worker Safety).**

If implementation of an Energy Commission-approved Final Closure Plan and Cost Estimate is not initiated within one (1) year of its approval date, it shall be updated and re-submitted to the Commission for supplementary review and approval. If a project owner initiates but then suspends closure activities, and the suspension continues for longer than one (1) year, or subsequently abandons the facility, the Final Closure Plan and Cost Estimate shall be resubmitted to the Commission for supplementary review and approval. The project owner remains liable for all costs of contingency planning and closure.

KEY EVENTS LIST

PROJECT: _____

DOCKET #: _____

COMPLIANCE PROJECT MANAGER: _____

EVENT DESCRIPTION	DATE
Certification Date	
Obtain Site Control	
On-line Date	
POWER PLANT SITE ACTIVITIES	
Start Site Assessment/Pre-construction	
Start Site Mobilization/Construction	
Begin Pouring Major Foundation Concrete	
Begin Installation of Major Equipment	
Completion of Installation of Major Equipment	
First Combustion of Gas Turbine	
Obtain Building Occupation Permit	
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	

Compliance Table 1:
Summary of Compliance Conditions of Certification

CONDITION NUMBER	SUBJECT	DESCRIPTION
COM-1	Unrestricted Access	The project owner shall grant Energy Commission staff and delegate agencies or consultants unrestricted access to the power plant site.
COM-2	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	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-4	Pre-construction Matrix and Tasks Prior to Start of Construction	Construction shall not commence until all of the following activities/submittals have been completed: Project owner has submitted a pre-construction matrix identifying conditions to be fulfilled before the start of construction; Project owner has completed all pre-construction conditions to the CPM's satisfaction; and CPM has issued a letter to the project owner authorizing construction.
COM-5	Compliance Matrix	The project owner shall submit a compliance matrix (in a spreadsheet format) with each Monthly and Annual Compliance Report, which includes the current status of all **Compliance** Conditions of Certification.
COM-6	Monthly Compliance Reports and Key Events List	During construction, the project owner shall submit Monthly Compliance Reports (MCRs) which include specific information. The first MCR is due 1 month following the docketing of the Energy Commission's Decision and shall include an initial list of dates for each of the events identified on the Key Events List.
COM-7	Annual Compliance Reports	After construction ends and throughout the life of the project, the project owner shall submit Annual Compliance Reports (ACRs) instead of Monthly Compliance Reports.
COM-8	Confidential Information	Any information the project owner designates as confidential shall be submitted to the Energy Commission's Executive Director with a request for confidentiality.
COM-9	Annual Fees	Required payment of the Annual Energy Facility Compliance Fee.
COM-10	Amendments, Staff-Approved Project Modifications, Ownership Changes, and Verification Changes	The project owner shall petition the Energy Commission to delete or change a condition of certification, modify the project design or operational requirements, and/or transfer ownership or operational control of the facility.

Compliance ConditionsTable 1:
Summary of Compliance Conditions of Certification

CONDITION NUMBER	SUBJECT	DESCRIPTION
COM-11	Reporting of Complaints, Notices, and Citations	Prior to the start of construction, the project owner shall provide all property owners within a 1-mile radius a telephone number to contact project representatives with questions, complaints or concerns. The project owner shall respond to all recorded complaints within 24 hours. Within 10 days of receipt, the project owner shall report to the CPM all notices, complaints, violations, and citations.
COM-12	Site Contingency Plan	No less than 60 days prior to the start of commercial operation the project owner shall submit an on-site Contingency Plan to ensure protection of public health and safety and environmental quality during a response to an unanticipated event or emergency.
COM-13	Incident-Reporting Requirements	The project owner shall notify the CPM within 1 hour of an incident and submit a detailed incident report within 30 days, maintain records of incident report, and submit public health and safety documents with employee training provisions.
COM-14	Non-Operation	No later than 2 weeks prior to a facility's planned non-operation, or no later than 2 weeks after the start of unplanned non-operation, the project owner shall notify the CPM, interested agencies and nearby property owners of this status. During non-operation, the project owner shall provide written updates to the CPM.
COM-15	Facility Closure Planning	Within 60 days after initiating commercial operation, the project owner shall submit a Provisional Closure Plan and Cost Estimate for permanent closure. At least 3 years prior to closing, the project owner shall submit a Final Closure Plan and Cost Estimate.

ATTACHMENT A
COMPLAINT REPORT/RESOLUTION FORM

COMPLAINT LOG NUMBER:_____ DOCKET NUMBER:_____

PROJECT NAME:_____

NAME:_____ PHONE NUMBER:_____

ADDRESS:_____

COMPLAINANT INFORMATION
COMPLAINT

DATE COMPLAINT RECEIVED:_____ TIME COMPLAINT RECEIVED:_____

COMPLAINT RECEIVED BY: _____ ☐ TELEPHONE ☐ IN WRITING (COPY ATTACHED)

DATE OF FIRST OCCURRENCE:_____

DESCRIPTION OF COMPLAINT (INCLUDING DATES, FREQUENCY, AND DURATION):_____

FINDINGS OF INVESTIGATION BY PLANT PERSONNEL:_____

DOES COMPLAINT RELATE TO VIOLATION OF A CEC REQUIREMENT? ☐ YES ☐ NO

DATE COMPLAINANT CONTACTED TO DISCUSS FINDINGS:_____

DESCRIPTION OF CORRECTIVE MEASURES TAKEN OR OTHER COMPLAINT RESOLUTION:_____

DOES COMPLAINANT AGREE WITH PROPOSED RESOLUTION? ☐ YES ☐ NO

IF NOT, EXPLAIN:_____

CORRECTIVE ACTION

IF CORRECTIVE ACTION NECESSARY, DATE COMPLETED:_____

DATE FIRST LETTER SENT TO COMPLAINANT (COPY ATTACHED):_____

DATE FINAL LETTER SENT TO COMPLAINANT (COPY ATTACHED):_____

OTHER RELEVANT INFORMATION:_____

"This information is certified to be correct."

PLANT MANAGER SIGNATURE:_____ DATE:_____

(ATTACH ADDITIONAL PAGES AND ALL SUPPORTING DOCUMENTATION, AS REQUIRED)

PREPARATION TEAM

EL SEGUNDO ENERGY CENTER 00-AFC-14C

FINAL STAFF ASSESSMENT PART A

El Segundo Power Facility Modification (ESPFM) Amendment

PREPARATION TEAM

Executive Summary ..... Christine Stora

Introduction ..... Christine Stora

Project Description ..... Christine Stora

Environmental Assessment

Biological Resources ..... Ann Crisp

Cultural Resources ..... Gabriel Roark, M.A., Melissa Mourkas, M.A., ASLA, and Thomas Gates, Ph.D.

Hazardous Materials Management ..... Alvin Greenberg, Ph.D.

Land Use ..... Michael C. Baron

Noise and Vibration ..... Shahab Khoshmashrab, P.E.

Public Health ..... Obed Odoemelam, Ph.D.

Socioeconomics ..... James Adams and Lisa Worrall

Soil and Water Resources ..... Mike Conway, P.G.

Traffic and Transportation ..... Jonathan Fong

Transmission Line Safety and Nuisance ..... Obed Odoemelam, Ph.D.

Visual Resources ..... William Kanemoto

Waste Management ..... Ellie Townsend-Hough

Worker Safety/Fire Protection ..... Alvin Greenberg, Ph.D.

Engineering Assessment

Facility Design ..... Shahab Khoshmashrab, P.E. and Edward Brady, P.E.

Geology and Paleontology ..... Casey Weaver, CEG

Power Plant Efficiency ..... Edward Brady

Power Plant Reliability ..... Edward Brady

Transmission System Engineering ..... Sudath Edirisuriya and Mark Hesters

Alternatives ..... Steven Kerr

Compliance Conditions and Compliance Monitoring Plan ..... Christine Stora

Project Assistant ..... Marci Errecart

Staff Attorney ..... Elena Miller, J.D.

CHRISTINE R. STORA

EXPERIENCE SUMMARY

Ten years of project, program, and staff management experience related to the development of energy projects in North America and other international locations. Technical focus on NEPA, and CEQA compliance, planning, permitting, and compliance monitoring.

PROFESSIONAL EXPERIENCE AND EDUCATION

CALIFORNIA ENERGY COMMISSION COMPLIANCE PROJECT MANAGER
06/2010 to Present

Manages power plant compliance for licensed power plants in California including solar, geothermal, and natural gas. Duties include oversight of power plant construction and ensuring that the conditions of certification are being met throughout construction, operation, and decommissioning of various power plants in California. Reviews petitions to amend existing licenses and gives recommendations to the Commission for approval or denial of requests. Coordinate with Commission technical staff, Certified Building Officers, other regulatory agencies, developers, contractors, and the public to ensure power projects are in compliance with all applicable conditions of certification and LORS. Working knowledge of CEQA, NEPA, and the Warren-Alquist Act.

Construction Compliance Project Manager for the following projects:

- Calpine's Los Esteros 2 Power Plant conversion of the simple-cycle power plant (Los Esteros I) to a combined-cycle with a total output of 320 MW located in north San Jose CA.
- GenOn's Marsh Landing Generating Station 760 MW simple-cycle power plant located in Antioch CA.
- Northern California Power Authority's Lodi Energy Center 255 MW combined-cycle power plant located in Lodi CA.
- Turlock Irrigation District's Almond 2 Power Plant 174 MW simple-cycle peaker located in Modesto CA.
- Calpine's Sutter Energy Center Grimes Pipeline, a 2.8 mile natural gas pipeline.

Amendment Project Manager:
Responsible for all Commission Amendments from 06/2010 to 4/2011. Duties included developing the Amendment Procedures Guidance Document for Compliance Project Managers at the Commission. This document is currently being used to develop new legislation for Commission Compliance. Coordinate with technical staff, project owners and make recommendations to the Commission regarding changes.
Amendment Highlights:

- CE Obsidian Energy, LLC, Black Rock 1, 2, and 3 Geothermal Power Project amendment to increase generating capacity to 215 MW as a multi-flash, single-generator facility.
- Calpine's Sutter Energy Center (540 MW) amendment to install the 2.8 mile, 6 inch, Grimes natural gas pipeline.
- Turlock Irrigation District's Walnut Energy Center (250 MW) amendment to change annual water usage.
- Sacramento Municipal Utility District's (SMUD's) Cosumnes Power Project (500 MW) amendment to inject digester gas from the Sacramento Regional Wastewater Treatment Plant into the natural gas supply line serving the CPP.

Operational Compliance Project Manager on various projects located throughout the state of California.

URS CORPORATION RENEWABLE ENERGY PROJECT AND STAFF MANAGER 11/2003 to 5/2010

Managed the Renewable Energy Group in the URS Sacramento office consisting of Environmental Scientists, Real Estate Specialists, Marketing Staff and Biologists. As a Project Manager, I provided environmental planning services for international renewable energy clients through sitting, permitting, construction, and post construction, environmental monitoring and compliance. I coordinated multiple disciplines for NEPA and CEQA compliance documents (EISs/EIRs) and other environmental reports related to renewable energy development. I coordinated field surveys as the lead field technician (surveys included avian mortality studies for wind energy developments, wetland delineations, burrowing owl surveys, meteorological siting investigations, geotechnical investigations, and other technical disciplines). I also contributed to marketing and research efforts for the URS renewable energy marketing sector including attending conferences such as the annual Wind Power Conference held by the American Wind Energy Association (AWEA).

Professional awards and certifications include:

- URS Team Award for a Wind Energy Environmental Planning for a team I managed (February 2010)
- URS Monthly Outstanding Achievement Award for Marketing Efforts in the Renewable Energy Sector (December 2008)
- Individual Outstanding Achievement Award in Project Management (2007)
- URS Project Manager Certification (November 2007)

Assignment Highlights

Deputy Project Manager, Searchlight Wind Project, Searchlight, NV, Bureau of Land Management. Duke's Searchlight Wind Project is a 370 MW project consisting of up to 161 wind turbine generators. Provided wind energy planning services including the development of the Plan of Development, Environmental Assessment, and the EIS for

the Searchlight Wind Power Project. Managed budget, schedule and technical staff in several URS offices for this effort.

Deputy Project Manager, Sacramento Municipal Utility District (SMUD) Solano Wind Project. November 2003 to March 2010. Responsible for overseeing budgets and schedule for all task orders. Monitored subcontractors and technical staff in a verity of efforts ranging from EIR preparation, biological field surveys, meteorological investigations, land acquisitions and other program activities. Proposal Manager for multiple efforts for this client. Developed program management plans and tracked tasks in MS Project. Managed task orders and staff. Contributed to strategic planning with client. Provided technical guidance and oversight to renewable energy technical staff.

Project Manager, Benicia Wind Project, Benicia CA, Silicon Valley Power (SVP). As a municipal utility SVP will be the lead agency for the EIR and other environmental documentation required for this 40 MW wind power project. Responsible for the direction of planning, environmental assessment, and consulting services provided to the client. These services include reviewing the Solano County General Plan and EIR's for surrounding projects in preparation of developing this project, assisting with the procurement, permitting, and installation of meteorological equipment, and contract negotiations.

Wind Contract Review Services, Gargau Wind Project, Rio de Janeiro, Brazil, for WestLB, Engineering Fatal Flaw Analysis. Assisted in engineering fatal flaw analysis. Documents under review included contractual agreements, the power purchase agreement, supply documents, balance of plant documents, and others. Provided project management support, including budget and schedule management for this project.

Project Management Assistance, Airtricity Asset Due Dilligance, USA and Canada, Confidential Client. Provided Project Management Assistance for an international technical team to assess the value and status of Airticity's operations for purchase by a private investing firm. At the time of the acquisition Airtricity was currently operating wind farms with around 210 MW installed capacity with an additional 880 MW to be operational by the end of 2008. Other Airtricity projects across US and Canada totaled more than 5,000 MW and were in an early development stage at the time of this project.

EDUCATION AND HONORS

Bachelor of Science Degree in Environmental Science from Humboldt State University (2003).

Academic honors include Cum Laude Honors Humboldt State University (2003) and Fall Presidential Scholar Humboldt State University (2001).

DECLARATION OF
Ann Crisp

I, **Ann Crisp**, declare as follows:

1. I am presently employed by the California Energy Commission in the Siting, Transmission and Environmental Protection Division as a **Planner II**.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I helped prepare the staff testimony on **Biological Resources** for the **El Segundo Energy Center Amendment (00-AFC-14C)**, based on my independent analysis of the Peition to Amend and supplements thereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue(s) addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and, if called as a witness, could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: 9/25/14

Signed: _____

At: Sacramento, California

Ann M. Crisp

Employment History

California Energy Commission

Planner II – Staff Biologist *03/2010 to present*

As a staff biologist with the Energy Commission, Ms. Crisp analyzes the biological resource components of energy facilities siting applications to assess resource impacts, develop mitigation, and to evaluate compliance with applicable local, state, and federal laws, ordinances, regulations, and standards. This requires working closely with biological resource protection and management agencies, subject matter experts, and Energy Commission consultants as well as with other Energy Commission staff to ensure the best available information is included in staff analyses.

Robertson-Bryan, Inc.

Staff Biologist *11/2006 to 03/2010*

Ms. Crisp's duties with Robertson-Bryan, Inc. included development of technical study reports and presentations based on the conclusions of field studies for the Middle Fork American River Project (MFP) Integrated Licensing Process for the Placer County Water Agency. She conducted field studies in preparation of the biological resources component of the MFP and the Big Creek System Alternative Licensing Process for Southern California Edison Company (SCE) including wildlife reconnaissance surveys, protocol-level wildlife surveys (including bald eagle wintering and nesting surveys and California red-legged frog surveys) and botanical surveys (including special-status plant species, noxious weeds, and plants of cultural concern for Native Americans). Ms. Crisp prepared documents supporting various management plans as part of the Big Creek No. 4 Traditional Licensing Process for SCE, including yearly monitoring reports for the Sediment Management Plan, Noxious Weed Management Plan, and Valley Elderberry Longhorn Beetle Management Plan. She also prepared and reviewed technical reports and California Environmental Quality Act (CEQA)/National Environmental Policy Act (NEPA) chapters on terrestrial resources.

Pacific States Marine Fisheries Commission/ California Department of Fish and Game

Research Technician *03/2006 to 11/2006*

While working with the California Department of Fish and Game through a partnership with the Pacific States Marine Fisheries Commission, Ms. Crisp conducted various focused wildlife surveys including reptile and amphibian cover board surveys, small mammal mark-recapture surveys, burrowing owl nest surveys, and California tiger salamander larval surveys. She collaborated on design and execution vegetation sampling protocol at multiple survey areas.

California Department of Fish and Game

Scientific Aid *11/2005 to 01/2006*

Ms. Crisp led tours of the Nimbus Fish Hatchery to provide information on the function of the hatchery and fish biology to school groups and the general public.

Humboldt State Foundation / California Department of Fish and Game

Wildlife Research Assistant *03/2005 to 10/2005*

While working with the California Department of Fish and Game (CDFG) through a partnership with the Humboldt State Foundation, Ms. Crisp conducted field-based vegetation sampling to classify vegetation types/wildlife habitats on multiple CDFG Wildlife Areas and Ecological Reserves. She was responsible for data management and preparation for inclusion in a statewide database. Ms. Crisp also conducted focused wildlife surveys including reptile and amphibian cover board surveys, small mammal live-trapping surveys, and nocturnal mammal spotlight surveys.

Oregon State University

Research Technician *06/2004 to 09/2004*

Ms. Crisp conducted bat surveys and vegetation inventories and assessments on a bat survey crew in western Oregon. This included collecting data on bat activity using Anabat II detectors, capturing bats using mist nets and H-nets and collecting biological samples and morphological data and vegetation sampling.

Sacramento Regional County Sanitation District – Bufferlands

Senior Student Intern *07/2003 to 03/2004*

Ms. Crisp assisted with various habitat restoration and management projects within the 2,650-acres surrounding the Sacramento Regional Wastewater Treatment Plant. She conducted waterfowl and shorebird surveys as well as sensitive species surveys. Other duties included landscape maintenance and water quality monitoring.

EDUCATION

Wildlife, Fish, and Conservation Biology *BS*
University of California, Davis *June 2004*

Natural Science *AA*
College of Marin *June 1998*

DECLARATION OF
Gabriel Roark, M.A.

I, **Gabriel Roark**, declare as follows:

1. I am presently employed by the California Energy Commission in the Siting, Transmission and Environmental Protection Division as an **Energy Planner II (archaeologist).**

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I helped prepare the staff testimony on **Cultural Resources** for the **El Segundo Energy Center Amendment (00-AFC-14C)**, based on my independent analysis of the Petition to Amend and supplements thereto, data from reliable documents and sources, and my professional experience and knowledge of regional and local archaeological resources.

4. It is my professional opinion that the prepared testimony on archaeological resources is valid and accurate with respect to the issue(s) addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony relating to archaeological resources and, if called as a witness, could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: 09/15/2014

Signed: 

At: Sacramento, California

GABRIEL ROARK, M.A.
Archaeologist

Since 1999, Mr. Roark has directed and conducted cultural resource investigations for projects involving the California Environmental Quality Act (CEQA), National Environmental Policy Act (NEPA), and Section 106 of the National Historic Preservation Act (NHPA). Mr. Roark possesses extensive professional experience in prehistoric archaeology, historical archaeology, and regulatory compliance, routinely serving as the project manager and technical lead on several projects simultaneously. He specializes in the design and implementation of archaeological monitoring programs, archaeological surveys and excavations, archival research, and CEQA and Section impact analyses. His Section 106 experience includes drafting memoranda of agreement, programmatic agreements, and historic properties treatment plans.

Professional Employment History

State Energy Resources Conservation and Development Commission (Energy Commission). Energy Planner II. June 1, 2012–present. Sacramento, California.

Mr. Roark's primary duty at the Energy Commission is the preparation of independent analyses of the potential cultural resource impacts engendered by proposed power plant projects and amendments. Analysis consists of reviewing applications for certification and various other applicant submittals, verifying and augmenting the information contained therein through independent research. As a staff archaeologist in the Cultural Resources Unit, he personally examines proposed project sites to verify and record current conditions on-site. Duties also include management of consultants; application of local, state, and federal laws, ordinances, regulations, and standards to proposed projects; reviewing compliance documents for existing power plants; and assistance with tribal consultation.

ICF International (formerly Jones & Stokes). Senior Associate (Archaeologist). February 23, 1999–May 30, 2012. Sacramento, California.

Mr. Roark provided comprehensive cultural resources management services to federal, state, and local agencies across resource and business sectors, as well as to non-profit

Years of Experience

- Professional start date: 02/23/1999

Education

- MA, Anthropology, California State University, Sacramento, 2009
- BA, Anthropology, California State University, Sacramento, 1999

Professional Memberships

- Archaeological Resources Committee, State Historical Resources Commission

Special Training

- Cascade Range Archaeological Project, Crew Chief, California State University, Sacramento, 1999
- Archaeological Field School, Mammoth Lakes, California State University, Sacramento (Dr. Mark E. Basgall, Director), 1999
- Anthropology 199: Introduction to Analysis of California Gold Rush Chinese Ceramics, Independent Study, California State University, Sacramento (Dr. Jerald J. Johnson, Instructor), 1999
- Anthropology 195A and 192: Fieldwork and Laboratory Work in Archaeology, Coloma, California State University, Sacramento (Dr. Jerald J. Johnson and Dr. Tom Strasser, Instructors), 1997

organizations and for-profit developers. Although the emphasis of this work was in archaeological resource management, Mr. Roark also consulted with Indian tribes regarding traditional cultural properties and conducted supervised architectural recordation. Regulatory experience includes CEQA, Warren-Alquist Act, Section 106 of the NHPA, NEPA, Archaeological Resources Protection Act, State–tribal gaming compacts (tribal environmental impact reports) and the Native American Graves Protection and Repatriation Act (NAGPRA). He has authored and co-authored a wide variety of cultural resources management documents: constraints analyses, categorical exemptions and exclusions, cultural resources inventory reports, archaeological survey reports, archaeological research designs (presence/absence testing, test excavation, and data recovery), cultural resources management plans, construction monitoring programs, environmental compliance training, test excavation reports, geoarchaeological analyses, initial studies, environmental assessments, and environmental impact reports/statements. Mr. Roark has surveyed, evaluated, and excavated several archaeological and cultural resources in the North Coast Ranges, Central Valley, Cascade Ranges, Sierra Nevada, South Coast Ranges, Mojave Desert, and Los Angeles Basin of California.

Representative Project Experience—California Energy Commission

In addition to the proposed Huntington Beach Energy Project, Mr. Roark presently serves as the lead cultural resources analyst and archaeologist for the Hydrogen Energy California project (Kern County), Alamitos Energy Center (Los Angeles County), Redondo Beach Energy Project (Los Angeles County), and El Segundo Energy Center (Los Angeles County).

Duties include review of applicant submittals, issuing data requests, research in historical repositories and online, and preparation of staff assessments.

Representative Project Experience—ICF International/Jones & Stokes

Energy and Fuels

Grimes Pipeline Environmental Services—CPN Pipeline Company, Sutter County, California (2010–2012)

Archaeologist. As lead archaeologist for this proposed natural gas pipeline, Mr. Roark was responsible for helping CPN Pipeline comply with the cultural resources requirements of the California Energy Commission and Section 106 of the NHPA. Duties

included records search and literature review; tribal consultation; coordination with Commission staff; archaeological survey; preparation of cultural resources reports, management plans, and portions of the application for certification; and direction of a geoarchaeological investigation.

Tri-Valley 2002 Capacity Increase Project—Pacific Gas and Electric Company (PG&E), Alameda and Contra Costa Counties, California (2000–2004)

Cultural Resources Manager. Mr. Roark designed a program of cultural resource compliance to satisfy the mitigation monitoring program previously prepared for the project. The cultural resources compliance program included archival research, consultation with Native Americans, cultural resource inventories and evaluations, and preparation of a comprehensive cultural resources treatment plan (CRTP). The CRTP set the procedures and standards for archaeological monitoring during construction, procedures for dealing with accidental discoveries, and reporting methods. Also monitored construction in sensitive areas and assisted with an inadvertent discovery of archaeological materials.

Los Banos-Gates 500-kV Transmission Line Project (Path 15)—Infrasource, Inc., Merced and Fresno Counties, California (2003–2005)

Lead Archaeologist for the Path 15 archaeological monitoring program designed by the Western Area Power Administration (Western). Evaluated cultural resources identified by resource monitors, including Native American monitors, over an 84-mile project corridor. Responded to over 70 inadvertent discoveries—recording, test excavating, and researching a total of 26 archaeological sites. Also surveyed newly added project elements and assisted Western and Infrasource with Section 106 compliance.

Path 15 GPS Data Collection Project—Western Area Power Administration, Merced and Fresno Counties, California (2011–2012)

Principal investigator and field director. Western hired ICF to evaluate the National Register eligibility of eight historic and prehistoric archaeological sites that I had recorded between 2003 and 2005. Mr. Roark prepared a research design for evaluating the sites in consultation with Western. The research design presented research questions that could be answered through detailed analysis of surface manifestations alone under favorable conditions or through archival research. Mr. Roark directed fieldwork, which consisted of intensive surface recordation.

Vantage Wind Energy Project Cultural Resources Inventory—Kittitas County, Washington (2011)

Archaeologist. Contributing author responsible for reporting survey methods and findings, as well as recommendations for the treatment of archaeological resources. Also prepared environmental and cultural contexts for the report.

Central Valley Gas Storage Project Section 106 Consultation—Central Valley Gas Storage, LLC, Colusa County, California (2010–2011)

Lead archaeologist. The project consisted of a 17-mile natural gas pipeline from the Sacramento River across the Colusa Sink to the foothills on the eastern flank of the North Coast Ranges. Completed a cultural resources inventory for compliance with Section 106, CEQA, and California Public Utilities compliance. Tasks included records searches, correspondence with Indian tribes, a geoachaeological assessment (literature based) of the project area, and preparation of an inventory report.

Carrizo-Midway 230kV Transmission Line Reconductoring Project—Pacific Gas and Electric Company (PG&E), Kern and San Luis Obispo Counties, California (2010–2011)

Lead cultural resources manager. Responsible for CEQA and Section 106 compliance on a 30-mile transmission line reconductoring project. Directed all aspects of the cultural resources work: research, geoarchaeological assessment, Indian consultation, survey, and reporting. Advised PG&E on feasible avoidance measures to protect about a dozen archaeological sites.

Palermo to East Nicolaus Transmission Line Reconstruction Project Proponent's EA Preparation—Pacific Gas and Electric Company (PG&E), Northern California (2006–2009)

Project manager and lead archaeologist. Managed Section 106 and CEQA compliance tasks, including research, consultation with Indians and historical societies, archaeological and historic structures surveys, evaluation of identified resources (historic archaeological and built environment), report preparation (cultural resources report and section of proponent's EA), and agency coordination. Designed the survey parameters such that PG&E did not have to authorize additional survey during construction.

Central California Clean Energy Transmission Project Proponent's EA—Pacific Gas and Electric Company (PG&E), Fresno, Kern, Kings, Madera, and Tulare Counties, California (2009–2010)

Lead cultural resources manager. Advised PG&E regarding cultural resources regulatory compliance strategy and

responsibilities from the project design phase through late-stage project planning. Ranked several alternative transmission line routes via a GIS-based model of cultural resources distribution and sensitivity. Conducted records searches and research, consulted with Indian groups, directed archaeological and built-environment surveys, and prepared iterative cultural resource reports.

Transportation

I-5/Cosumnes River Boulevard Interchange Project—City of Sacramento, California (2001–2002)

Lead Archaeologist for analysis of an 880-acre study area (slated for the extension of Cosumnes River Boulevard to I-5) to comply with Section 106 of the NHPA and CEQA. In addition to using standard inventory methods, Mr. Roark led a five-person crew in presence/absence excavations designed to explore geophysical anomalies detected through remote-sensing applications.

Preconstruction and Construction Environmental Monitoring—City of Sacramento/ Vali Cooper, Sacramento, California (2011–2012)

Project Manager and Lead Archaeological Monitor. Mr. Roark managed the biological and archaeological mitigation monitoring program for the first phase of the Sacramento Intermodal Transportation Facility (track relocation). His responsibilities consisted of interfacing with construction management staff to ensure that ICF is informed of construction activities and their schedule, deploying biological and archaeological monitors as needed, and responding to inadvertent archaeological discoveries.

Cultural Resources Compliance Support for the Railyards Initial Phase Project—Kimley-Horn Associates, Sacramento, California (2009–2012)

Project manager and lead archaeologist. Coauthored the archaeological testing plan for prehistoric and historic archaeological sites, using geotechnical data and historic maps to identify archaeologically sensitive areas. Also prepared the project inadvertent archaeological discovery plan. Crew chief for mechanical archaeological testing; identified the historic 6th Street Levee.

Railyards Archaeological Monitoring of Soil Remediation—Thomas Enterprises/ERM West, Sacramento, California (2007–2012)

Project manager and lead archaeological monitor. Responsibilities included construction monitoring, staff scheduling, evaluating inadvertent archaeological discoveries and coordinating such

evaluations with staff from the California State Railroad Museum, reporting, and training construction staff in the proper procedures for archaeological discoveries.

Sacramento Intermodal Transit Facility Track Relocation Project Environmental Documents for CEQA/NEPA—City of Sacramento, California (2008–2012)

Lead archaeologist and project manager. Advised Caltrans and the City of Sacramento as to Section 106 and NEPA compliance concerning cultural resources. Due to the shortened compliance schedule entailed with American Recovery and Reinvestment Act funding, recommended a tiered approach that secured funding and protected cultural resources. Directed identification of surface archaeological resources, archival and geoarchaeological research to isolate potential buried archaeological resources, and preparation of an archaeological resources treatment plan. Exploratory and evaluative test excavations, components of the treatment plan, are underway. In 2011, Mr. Roark was selected to manage preparation of a NEPA re-validation document, air quality conformity analysis, and cultural resources inventory of a modification to the project.

Water

Freeport Regional Water Project—Freeport Regional Water Authority, Sacramento and San Joaquin Counties, California (2005–2009)

Lead cultural resource manager and lead archaeological monitor. Prior to construction of the FRWP, led ICF's cultural resources inventory of the 30-mile-long project and drafted a memorandum of agreement (MOA), to direct compliance with Section 106 of the NHPA. The MOA established procedures for the inventory of changes to the FRWP area, treatment of a historic property, and inadvertent archaeological discoveries during construction. Construction resulted in one inadvertent discovery of cultural resources. Worked with Bureau of Reclamation and construction staff to comply with the project MOA while allowing the contractor to continue work on the project. The construction contractors identified the need for additional work areas after the MOA was executed. These areas needed to be surveyed and reported to the lead federal agency, Reclamation, and SHPO, which began to cause construction delays. Negotiated an amended MOA with Reclamation and the SHPO that streamlined the review process for newly identified project components.

Battle Creek Salmon and Steelhead Restoration Project—U.S. Bureau of Reclamation (Reclamation) and State Water Board, Shasta and Tehama Counties, California (2003–2005)

Principal investigator. Prepared a research design and guided archaeological test excavations of five prehistoric archaeological sites in the Cascade Range foothills near Red Bluff. Worked closely with Reclamation archaeologists to devise a suitable research design and a schedule and approach to completing Section 106 consultation under a stringent timeline.

Lower Northwest Interceptor Project—Sacramento Regional County Sanitation District, Sacramento and Yolo Counties, California (2001–2005)

Lead cultural resources manager. Coordinated efforts to identify potential cultural resources issues for the pre-design and design phase of a 19-mile sewer alignment. The proposed alignment was routed through portions of the greater Sacramento region that are highly sensitive for the presence of buried archaeological sites. Led a research program consisting of archival research, modeling of historic environments, extensive cooperation with Native Americans and local archaeologists, and architectural and archaeological surveys to recommend appropriate mitigation measures for known and potential cultural resources. Prepared the cultural resources section of an EIR and the cultural resources inventory report for the project.

Lower Northwest Interceptor Project—Sacramento Regional County Sanitation District, Sacramento and Yolo Counties, California (2005–2007)

Lead archaeological monitor. Devised an archaeological monitoring program designed to comply with complex federal regulatory requirements, determined whether construction was likely to disturb buried archaeological deposits, trained monitors and construction staff in their roles as resource stewards during construction, and oversaw staff archaeologists' fieldwork and reporting. Monitoring program included excavation of 298 auger tests to determine whether archaeological deposits were present in the project area and monitoring by qualified archaeologists to verify the results of the auger tests.

Sacramento River Bank Protection Project EIS/EIR—U.S. Army Corps of Engineers (Corps)/HDR-JSA JV, Sacramento County, California (2008–2012)

Primary author of the programmatic agreement and historic properties treatment plan (HPTP) for this state/federal levee repair program. The programmatic agreement will guide the Corps' cultural resources program for the life of the project particularly in

the areas of consultation and documentation of cultural resource activities. The HPTP is a multidisciplinary document that stipulates appropriate identification efforts and treatment of a variety of property types: prehistoric and historic archaeology, non-archaeological properties of concern to Native Americans, historic built environment properties, cultural landscapes, and submerged resources.

Parks, Trails, and Open Space

Expansion of Frank Raines Regional Park—Stanislaus County Parks Department, Stanislaus County, California (1999)

Cultural Resources Manager. Conducted a literature review to determine the cultural resource sensitivity of the existing park and expansion area, then assisted County and ICF staff with the siting and development planning for new off-highway vehicle (OHV) trails so as to avoid known cultural resources and sensitive area. Also surveyed the various alternative OHV trails for the presence of cultural resources. Prepared a cultural resources inventory report in support of CEQA impact assessment.

El Dorado Hills Data Recovery—Serrano Associates, LLC, El Dorado County, California (2000)

Crew Member for archaeological excavations at 19th century mining camps and homestead sites located near the historic town of Clarksville. Member of the artifact analysis team and contributed to report preparation.

Suisun Marsh Management Plan EIS/EIR—California Department of Fish and Game (DFG), Solano County, California (2006–2010)

Cultural resources manager. Prepared a geoarchaeological assessment of Suisun Marsh to estimate the potential for buried and surface-manifested cultural resources for three project alternatives. Together with records search data and historic map research; the geoarchaeological assessment formed the crux of the analysis presented in the cultural resources section of the EIS/EIR.

Native American Projects

Big Sandy Casino and Resort Project EIS—Big Sandy Rancheria Band of Western Mono Indians, Fresno County, California (2007–present)

Cultural resources manager/principal investigator. Assisted Big Sandy Rancheria and the Bureau of Indian Affairs (BIA) with cultural resources compliance under NEPA and Section 106.

Directed records searches and archival research, supported BIA's consultation with Indian tribes, corresponded with historical societies and non-federally recognized tribes, met with the state historic preservation officer to discuss compliance effort, conducted archaeological surveys and directed two evaluative test excavations. In addition, worked with BIA, Big Sandy, and Table Mountain Rancheria to devise a plan of action, pursuant to the NAGPRA, for the treatment of Indian human remains discovered during excavations. Also assisted with reburial of Indian remains. Preparation of cultural resources reports and EIS sections.

Buena Vista Rancheria Gaming and Entertainment Facility Tribal EIR—Stevens & O'Connell, Amador County, California (2006–2008)

Lead Cultural Resources Manager. Responsible for coordinating archaeological and built-environment inventories and assessments of off-reservation road improvements. Responsibilities included conducting records searches, archival research, ethnographic literature review, archaeological survey, and contributions to the Tribal EIR. Additionally, prepared a cultural resources management plan for the Buena Vista Band of Me-Wuk Indians' property to guide heritage preservation on the casino property. Also led the Section 106 compliance effort by meeting with agency personnel, Indian groups, and other concerned groups to arrive at reasonable terms for a memorandum of agreement.

Ports and Harbors

Promenade Report of Archaeological Monitoring—Port of Los Angeles, San Pedro, California (2009)

Archaeologist. Contributing author to the archaeological monitoring report for numerous inadvertent archaeological discoveries in the historic neighborhood known as Mexican Hollywood. Contributions included archaeological feature descriptions, tabulated artifact (functional group) analysis, and interpretation of materials.

Development/Redevelopment Projects

Seaview Vineyard Development—Peter Michael Winery, Sonoma County, California (2000–2002)

Cultural Resources Team Leader on an archaeological test excavation of prehistoric site CA-SON-2306 that would be affected by development of a vineyard in coastal Sonoma County. The excavation was conducted to evaluate the site for California Register of Historical Resources and NRHP eligibility. Responsible for research, development of a test excavation

program, excavation, ground stone analysis, report preparation, and overall project management.

Fiber-Optic Cable

ARE-ON Fiber Expansion—University of Arkansas/BHC Rhodes, Arkansas (2010)

Cultural resources manager. Prepared Section 106 consultation letters and corresponded by telephone with Indian tribes on behalf of the National Telecommunications and Information Administration. Analyzed data provided by a local cultural resources consulting firm and prepared a environmental assessment sections on the basis of these data. The project covered 36 counties in Arkansas and consisted of several hundred miles of fiber-optic line.

Sacramento Region Fiber Optic Projects—XO California, Inc., Placer, Sacramento, and Yolo Counties, California (2000–2002)

Lead archaeologist. Managed cultural resources task, which consisted of providing sensitivity assessments, conducting inventories, and monitoring recommendations for more than 20 proposed fiber optic builds. Because the majority of the proposed builds were located in urban settings not surveyed for archaeological sites before development, designed inventory and assessment methods to identify areas that likely contained buried archaeological deposits. According to the results of each assessment, assigned archaeological or Native American monitors to sensitive project areas.

Publication

Roark, Gabriel A. 2009. An Archaeological Study of Culture Process and Projectile Point Variability in the Southern North Coast Ranges of California. Unpublished M.A. thesis, Department of Anthropology, California State University, Sacramento. Electronic document, http://csus-dspace.calstate.edu/handle/10211.9/660, accessed April 24, 2014.

DECLARATION OF
Melissa Mourkas, M.A., ASLA

I, **Melissa Mourkas**, declare as follows:

1. I am presently employed by the California Energy Commission in the Siting, Transmission and Environmental Protection Division as a **Cultural Resources-Built Environment Specialist- Planner II.**

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

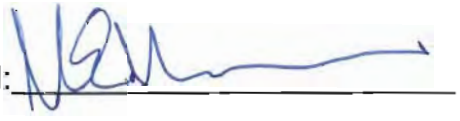
3. I helped prepare the staff testimony on **Cultural Resources** for the **El Segundo Energy Center Amendment (00-AFC-14C)**, based on my independent analysis of the Petition to Amend and supplements thereto, data from reliable documents and sources, and my professional experience and knowledge of the Built Environment.

4. It is my professional opinion that the prepared testimony on the Built Environment is valid and accurate with respect to the issue(s) addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony relating to the Built Environment and, if called as a witness, could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: 9/15/2014

Signed: 

At: Sacramento, California

MELISSA MOURKAS, ASLA

EDUCATION

MASTER OF ARTS, LANDSCAPE DESIGN & PLANNING, 1994
CONWAY SCHOOL OF LANDSCAPE DESIGN, CONWAY, MASSACHUSETTS
Graduate landscape design program providing professional training in site design and land-use planning. Curriculum emphasis is on sustainable landscape planning and design. Graduate projects included: Master Plan for a 45-acre historic resort, original landscape designed by F.L. Olmsted and Performance Standards for a proposed industrial park.

BACHELOR OF ARTS, HISTORY OF ARCHITECTURE & ART, 1981
SCRIPPS COLLEGE, CLAREMONT, CALIFORNIA
Major studies in Art and Architectural History, Urban Development. Senior thesis: documentation and analysis of the innovative residential designs and construction techniques of California modern architect Rudolf M. Schindler. Minor studies in Art and the Humanities.

PROFESSIONAL EXPERIENCE/QUALIFICATIONS

- Licensed Landscape Architect, California # 5139
- Qualified Architectural Historian, Secretary of the Interior's Standards for Historic Preservation, Code of Federal Regulations, 36 CFR Part 61.

LANDSCAPE ARCHITECTURE:

1994 to Present: Landscape Architecture and Design. Experience in landscape architecture, landscape construction estimating, site planning, historic landscapes and landscape master plans. Provide landscape architecture and consulting services to private clients, public organizations, contractors, and design firms. Preparation of Cultural Landscape Reports. Frequent speaker to various groups on landscape design, construction and cultural landscapes.

PLANNING AND HISTORIC PRESERVATION:

April 2010 to Present: Planner II, California Energy Commission, Siting, Transmission and Environmental Protection Division. Provide technical environmental analysis of proposed energy facilities and development. Review of EIR/EIS documents prepared by other agencies under NEPA. Specific tasks include: the assessment of potential impacts of new electric power plants on both Visual and Cultural Resources; identification of suitable mitigation measures under CEQA; preparation of written testimony; participation in public workshops; presentation of sworn testimony during evidentiary hearings, and project monitoring to ensure compliance with local, state and federal environmental laws and regulations. Cultural Resources specialty in the built environment. Section 106 review of federally-funded energy efficiency upgrades under Programmatic Agreement with California OHP.

2008-2014: Member, City of Sacramento Preservation Commission (Chair 2013-2014)

2005 to 2008: Assistant Planner, Historic Preservation Office, City of Sacramento, CA
Responsible for design review and approval for private and public development projects involving rehabilitation, preservation and restoration of historic resources and districts under CEQA. Prepared staff reports for Preservation Commission and Council, and coordinated with other planning staff on concurrent entitlements. Staff liaison on municipal development projects involving historic resources.

DECLARATION OF
Thomas Gates, Ph.D.

I, **Thomas Gates**, declare as follows:

1. I am presently employed by the California Energy Commission in the Siting, Transmission and Environmental Protection Division as a cultural Resources Analyst, Ethnographer.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I helped prepare the staff testimony on ethnographic portions of the cultural resources section for the **El Segundo Energy Center Amendment (00-AFC-14C)**, based on my independent analysis of the Petition to Amend and supplements thereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue(s) addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and, if called as a witness, could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: September 25, 2014 Signed: Thomas Gates

At: Sacramento, California

Thomas M. Gates, Ph.D.
Curriculum Vitae

EDUCATION
University of North Carolina at Chapel Hill, Ph.D., Anthropology, **Chapel Hill, NC 8/95**
Humboldt State University, B.A., Anthropology, B.A., Philosophy, Minor Studio Painting, **Arcata, CA**, **6/87**

NON-ACADEMIC EMPLOYMENT
California Energy Commission, Sacramento, CA, 1/1/12 – Present
Cultural Resources Analyst – Planner II
Work with a team of cultural resources professionals to review and respond to energy facility siting applications proposing energy facility construction or facility amendments located within the State of California. Specifically provide tribal consultation and ethnographic methods expertise.

Preservation Management Services, Sacramento, CA, 9/14/11 – Present
Self-Employed Owner
Secure, perform and complete contract work for tribal, federal, state, and local governments. Work includes following services: Tribal Historic Preservation Office (THPO) program development, operations and related training; THPO Cultural Resources Management Planning and facilitation; Cultural Landscape, traditional Cultural Property and Sacred Site Assessments, Cultural Resources Surveys and Cultural Resources monitor mitigation.

North State Resources, Inc., Sacramento, CA, 11/1/2009 – 11/08/11
Senior Program Manager:
Direct Cultural Resource Program for a team of CRM professionals to secure, perform and complete CRM cultural resource contracts on behalf of diverse client base (government agencies, developers, tribal governments. Also provided services in cultural resources training and tribal government planning facilitation.

SWCA Environmental Consultants, Sacramento, CA, 6/23/08-10/30/09
Senior Program Manager:
Direct Cultural Resource Program for a team of CRM professionals to secure, perform and complete CRM cultural resource contracts on behalf of diverse client base (government agencies, developers, tribal governments). Also provide training for Tribal Historic Preservation Officer (THPO) programs, NHPA Section 106 and Consultation with Indian Tribes.

Yurok Tribe, Klamath, CA, 5/1/03- 6/15/08
Self Governance Officer:
Coordinated Yurok governmental functions with local, state, federal governments; negotiated contracts, compacts, annual funding agreements, memorandums of understanding per the Indian Self Determination Act. More recently, handled tribal land appraisals, acquisitions, land acquisition funding, sustainable forestry management, tribal park planning and youth workforce creation.

Yurok Tribe, Klamath, CA, 9/4/96-6/15/08
Heritage Preservation Officer:
Performed Tribal Heritage Preservation Officer functions for Yurok Tribal Lands per NHPA § 101d(2)NPS Agreement. Provided Section 106 comment and made National Register nominations related to undertakings affecting tribal lands. Coordinated CHRIS Info Center/Tribal Inventory. Reviewed archeology survey reports and site records. Participated in the North Coast Strategic Partnership Coalition.

Yurok Tribe, Klamath, CA, 10/1/93– 5/1/03
Culture Department Director:
Directed a department with four divisions: Archeology, Archives, NAGPRA, Mapping and Compliance. Coordinated Tribal Elder's Cultural Committee, represented the tribe in Federal and State consultations pertaining to Yurok Culture. Managed multi-account program budget ($300,000/year) of base funding, grants and contracts for ethnographic research, archeological survey and monitoring and related planning.

USFS - Inyo NF, Bishop, CA, 6/1/80 – 8/31/89 (Seasonal)
Watershed Restoration Crew Leader/Member:
Supervised summer work-crews performing erosion control, dam construction, trail and road work and trout spawning site restoration in remote wilderness and back country settings; coordinated crew safety program.

ACADEMIC EMPLOYMENT

Humboldt State University, Arcata, CA, 6/1/92 - 5/31/07
Lecturer:
Cultural Anthropology, North American Indians and Anthropology of Religion

College of the Redwoods,Eureka, CA, 8/94-5/98
Adjunct Instructor:
Cultural Anthropology, Archeology, Folklore

University of North Carolina at Chapel Hill, Chapel Hill, NC, 8/1/88-5/31/90
Instructor:
General Anthropology
Teaching Assistant:
General and Cultural Anthropology

RESEARCH and PROJECTS

NSR – Assessing Effects to Indian Trust Resources and Cultural Values as a Result of Implementing the Klamath Basin Settlement Agreement to Remove Four Dams Along the Klamath River. 2010 – 2011. Project manager responsible for facilitating project Sub team (BIA and BOR) tribal consultations with 6 Klamath Basin Tribal governments and owners and heirs of Public Domain Allotments. Project also entails writing a Background Technical Report that assesses historic and current operation effects on trust resources. A final report is also being completed that assesses future operations affects on trust resources for two broad alternatives: "dams in" and "dams out."

SWCA – California Indian Heritage Center, Sacramento, CA, 2008 – 2011
Consult on behalf of California State Parks with tribal entities throughout the State of California in relation to the planning, design and construction of a $50 million facility and grounds located in Sacramento, and representing all California Tribes. Center will feature archaeological collections, archives, education classrooms, botanical gardens and demonstration village along banks of Sacramento River.

Yurok Tribal Park and Homeland Restoration, Klamath, CA, 2003 – 2008
Team Leader:
Coordination, planning, and acquisition for the Yurok Tribe initiative to regain homelands through creation of a tribal park system, marine sanctuary, community forest and related land purchases and transfers.

Yurok Tribe Condor Re-Introduction, Klamath, CA, 2007 – 2008
Principal:
Study of historic and environmental conditions conducive to the re-introduction of condor into Yurok territory.

Tsurai Village Site Management Plan, Trinidad, CA, 2003-2008
Team Leader:
Coordinated document drafting, community scoping, and negotiations leading to the transfer of a Yurok Archaeological site from the City of Trinidad to the Yurok Tribe.

North Coastal Information Center of the CHRIS, Klamath, CA, 2000-2008
Coordinator:
Negotiated, established and coordinated the North Coastal Information Center with CA SHPO; managed archeological and historical records and clearing house; provided review and compliance support for CEQA, Coastal Act, NEPA, NHPA, ARPA and CDF Timber Harvest Rule projects occurring in Humboldt and Del Norte counties.

Bald Hills Ethnographic Landscape Study, Orick, CA, 1999 – 2001
Co-Principal: Yurok Ethnographic use study of Bald Hills, Redwood National and State Parks (RNSP), Interview, field survey and record

Dissertation Fieldwork: Yurok Trail System, Klamath, CA, 1991-1995
Ph.D. Candidate: Compiled a history of Yurok trail systems, obtaining information from ethnographic interviews, literature, cartographic inventories, and archeological surveys.

Origins of the Peruvian Potato Project, Chapel Hill, NC, 1988
Research Assistant: University of North Carolina – Anthropology Lab. Peruvian Weather data entry, analysis – Assessment of trail distances between Andean potato gardens and villages in relation to garden sun exposure.

PUBLICATIONS

Yurok Tribe Comprehensive Cultural Resource Management Plan A 15 Year Plan for the Implementation of the Yurok Tribe - NPS Agreement to perform § 101d(2) functions of NHPA and other cultural resource related Tribal, Federal and State laws.

Along the Ridgelines: The History of Yurok Trail Systems, (Ph.D. Dissertation, UNC), **12/94**

The Asdiwal Myth Complex of the Tsimshian of the N*orthwest Coast of British Columbia* (4th semester paper, UNC), **5/89**

***Watershed Restoration Construction Safety Precautions Watershed Restoration Construction Manual* 6/87,** Inyo National Forest, U.S. Forest Service

APPOINTMENTS

National Association of THPOs – Co-founder and Board member	**1998-2008**
Historic Resource Information Centers of California – President	**1999-00**
Jacoby Creek Land Trust – Board Member and Recording Secretary	**1998-00**

AWARDS

CA State Senator Chesbro - *Recognition of Achievement* – for the passage of the 2002 Native American Historical Resources Protection Act

Research and Teaching Assistantships, UNC Dept. of Anthropology	**1987, 88, 89, 90**
USFS Employee Award – *Outstanding Service in the Field*	**1980, 81, 82, 86**

TRAINING

PSMJ Project Management Bootcamp, Phoenix, Arizona	**2009**

AFFILIATIONS

National Association of Tribal Heritage Preservation Officers
Society for California Archeology
National Trust for Historic Preservation
American Anthropological Association
California State Park Foundation
National Park Conservation Foundation
Smithsonian Institute
American Hiking Society

PERSONAL

Born 1962, Married 1984, two children (born: 1986, 1988)
Hobbies/Recreational Interests: watercolor painting, basketball, backpacking, gardening, landscaping, piano

REFERENCES

Larry Myers, Native American Heritage Commission
Tel: 916 653 3356 Email: lm_nahc@pacbell.net

Bambi Kraus, President, National Association of Tribal Historic Preservation Officers
Tel: 202 628-8476 Email: bambi@nathpo.org

Destry Jarvis, President, Outdoor Recreation and Parks Services Consulting
Tel: 540 338-6970 Email: destryjarvis@earthlink.net

Lynda Roush, Arcata Field Office Director, BLM
Tel: 707 825-2309 Email: Lynda_Roush@ca.blm.gov

Dan Hall, Archaeologist, BIA Sacramento Regional Office
Tel: 916 978-6041 Email: dan.hall@bia.gov

Troy Fletcher, Senior Policy Analyst, Yurok Tribe
Tel: 530 625 4015 Email: troy_fletcher@earthlink.net

Rhea Graham, Program Manager – Klamath River Dams Project, Bureau of Reclamation
Tel: 916 978 5113 Email: rgraham@usbr.gov

DECLARATION OF
Alvin J. Greenberg, Ph.D.

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

1. I am presently a consultant to the California Energy Commission in the Siting, Transmission and Environmental Protection Division.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

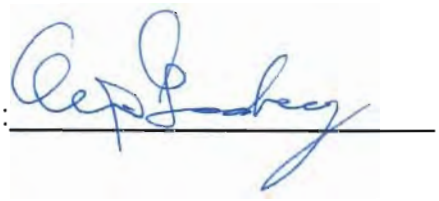
3. I helped prepare the staff testimony on **Hazardous Materials Management and Worker Safety/Fire Protection**, for the **El Segundo Energy Center Amendment (00-AFC-14C)**, based on my independent analysis of the Petition to Amend and supplements thereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue(s) addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and, if called as a witness, could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: June 3, 2014

Signed: 

At: San Rafael, California

Alvin Greenberg, Ph.D., QEP

37 Mt. Whitney Dr., Suite A, San Rafael, Ca. 94903
office 415-479-7560 cell 415-302-0438
e-mail agreenberg@risksci.com

Alvin Greenberg has a B.S. from the University of Illinois, Urbana, and a Ph.D. from the University of California San Francisco. He conducted postdoctoral research in neurotoxicology and served as an Assistant Professor at UCSF. He also attended the prestigious Lovelace Institute of Inhalation Toxicology in 1980 and is Board Certified as a Qualified Environmental Professional (QEP). Dr. Greenberg was formerly Chair of the Bay Area Air Quality Management District Hearing Board, a former Member of the State of California Occupational Health and Safety Standards Board (appointed by the Governor), and former Assistant Deputy Chief for Health, California OSHA.

Dr. Greenberg's expertise in risk assessment has led to his appointment as a member of several state and federal advisory committees, including the Cal/EPA Department of Toxic Substances Control Program Review Committee, the DTSC Integrated Site Mitigation Committee, the California State Water Resources Control Board Bay Protection and Toxic Cleanup Program Advisory Committee, the California EPA Advisory Committee on Stochastic Risk Assessment Methods, the U.S. EPA Workgroup on Cumulative Risk Assessment, the Cal/EPA Peer Review Committee of the Health Risks of Using Ethanol in Reformulated Gasoline, and the California Air Resources Board Advisory Committee on Diesel Emissions.

Dr. Greenberg has considerable experience and ability to manage and prepare CEQA and NEPA documentation for many projects, including gas-fired and solar power plants. In his work under contract to the California Energy Commission, He has authored and defended at Evidentiary Hearing over 150 CEQA-equivalent Staff Assessments for power plant siting cases in California over a 20-year period, including EIRs and EISs for ten solar power plants or solar/gas hybrids in the Southern California desert and a coal gasification plant in the San Joaquin Valley. He was responsible for preparing this documentation in the areas of Hazardous Materials Management, Worker Safety/Fire Protection, Public Health and Safety, Glare Risk Assessment, Impacts of Solar Flux on Avian Species, and Waste Management.

Since January 2005, he has trained and led an audit team conducting hazmat, safety, and security audits at power plants throughout California that are under the jurisdiction of the California Energy Commission. His unique experience in Cal-OSHA and with the CEC allows him to effectively identify safety and health hazards and recommend cost-effective solutions. Additionally, his training and experience in critical infrastructure security led to him to becoming the lead for the California Energy Commission development of a power plant vulnerability assessment methodology and model power plant security plan, reviewing and evaluating power plant security plans, testifying at hearings on power plant security, preparing a "background" report on the risks and hazards of siting LNG terminals in California, consulting for the City of Vallejo on a proposed LNG terminal and storage facility at the former Mare Island Naval Shipyard, and preparing safety and security recommendations for the proposed LNG terminal in Long Beach, CA.

He has also been the lead person for the CEC in gas pipeline safety review and evaluation. He is knowledgeable about and has experience implementing infrastructure security needs and methods and has U.S. Coast Guard Sensitive Security Information (SSI) and U.S. Department of Energy Critical Energy Infrastructure (CI) security clearances. Perhaps just as important, Dr. Greenberg has considerable experience and expertise in risk communication, explaining issues of exposure and risk to large groups of very concerned citizens on very complex and challenging projects. He has also testified in both Superior Court and U.S. District Court as an expert witness.

DECLARATION OF
Michael C. Baron

I, Michael C. Baron, declare as follows:

1. I am presently employed by the California Energy Commission in the Siting, Transmission and Environmental Protection Division, as a Planner II.

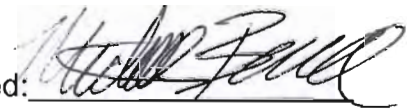
2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I prepared the staff testimony for the **Land Use Analysis** for the **El Segundo Energy Center Amendment** (**00-AFC-14C**) based on my independent analysis of the Application for Certification and supplements thereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue(s) addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: September 17, 2014 Signed: 

At: Sacramento, California

Michael C. Baron

Professional experience

2013-Present California Energy Commission Sacramento, CA

Planner II - Siting Transmission and Environmental Protection

- Technical Writing
- Prepare and Analyze Land Use Sections, Conditions of Certification, Findings and CEQA Documentation
- Energy Policy Analysis
- Perform Site Inspections

2011-2013 Caldwell Compliance Pleasanton, CA

Regulatory Analyst

- Audit Existing Leased/Owned Cell Tower Facilities for NEPA, SHPO, FAA, & FCC Compliance
- Analyze 1A/2C surveys, 620/621 SHPO submittals, NEPA reports, Phase I ESA, Tribal Notification System (TCNS), RF/Spectrum, Programmatic Agreement Letters (PAL)
- Verify Tower Height (HV), Marking and Lighting (M&L)
- Update and Upload Compliance Documentation within AT&T Internal Tracking Systems using Internal Software. i.e. ANGELS, Guardian, and Siterra
- FAA/FCC Database searches using notice Criteria Tool, TOWAIR Circle Search, and ASR Registration Search
- Sitesafe AM Tower Screening
- Work from Remote Station
- Participate/Lead in regulatory status meeting and conference calls

2004-2010 El Dorado County Planning Services Placerville, CA

Senior Planner

- Intake and Process Subdivision Maps, Planned Developments Commercial Design Reviews, Proposed Utility Projects, Variances, DEIR preparation, and Land Use Permits
- Develop Mitigation and Monitoring Programs
- Coordinate Site Improvements/Modifications with Utility Companies
- Front Counter Customer Service/Public Assistance
- Meeting Facilitation
- Prepare and Analyze Staff Reports, Conditions of Approval, Findings and CEQA Documentation
- Present Findings and Make Recommendations to Boards and Commissions
- Plan Review for Ordinances and General Plan Consistency
- Proficient Using Arcview, Arc Map, and Arc Catalog for GIS Long Range Planning Support and Exhibits
- Perform Site Inspections

2003-2004 BAP Construction Westmont, IL

Supervisor/Crew Leader

- Estimating Construction Costs
- Construction Management
- Interpret and Analyze Proposed Construction Plans
- Responsible for Permit Processing and Approvals
- Supervise and Assign Daily Tasks
- Scheduling and Tracking Project Milestones

2000-2002 SIUC Geography Department Carbondale, IL

Teaching Assistant- Weather Forecasting

- Guide Students Through Laboratory Experiments
- Assist Students During Office Hours
- Proctor Exams
- Grade All Homework and Exams

1999-2000 Southern 5 County Planning Commission Ullin, IL

GIS/Cartographic Assistant

- Develop and Layout Spatial Datasets using Arcview/ArcInfo
- Created, Maintained and Managed Road and Utility Database for Five Counties
- Present Data and Findings to Supervisors, Boards, and Commissions
- Perform Site Inspections

Education

1999-2003 Southern Illinois University Carbondale, IL

Master of Science, Geography

- Urban/Environmental Planning
- Quantitative Research Methods
- Socio-Cultural Research
- Sustainable Development Practices
- Alternative Energy Resources
- GIS/Cartographic Applications
- Disaster Planning
- Parks and Wild Lands Management

1996-1999 Southern Illinois University Carbondale, IL

Bachelor of Arts, Geography

- Urban/Environmental Planning
- GIS/Cartographic Applications
- Natural Resources Planning
- U.S. Environmental Policies Analysis
- Sustainable Development
- Socio-Economics

DECLARATION OF
SHAHAB KHOSHMASHRAB

I, **SHAHAB KHOSHMASHRAB**, declare as follows:

1. I am presently employed by the California Energy Commission in the **ENGINEERING OFFICE** of the Siting, Transmission, and Environmental Protection Division as a **SENIOR MECHANICAL ENGINEER**.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I participated in the preparation of the staff testimonies on **Noise and Vibration** and **Facility Design** for the **El Segundo Energy Center Amendment (00-AFC-14C)**, based on my independent analysis of the Petition to Amend and supplements thereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimonies are valid and accurate with respect to the issues addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimonies, and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: September 29, 2014 Signed: Shahab Khoshmashrab

At: Sacramento, California

Shahab Khoshmashrab
Senior Mechanical Engineer

Experience Summary

Eighteen years experience in the mechanical, civil, structural, and manufacturing engineering fields involving engineering and manufacturing of various mechanical components and building structures. This experience includes QA/QC, construction/licensing of electric generating power plants, analysis of noise pollution, and engineering and policy analysis of thermal power plant regulatory issues.

Education

- California State University, Sacramento-- Bachelor of Science, Mechanical Engineering
- Registered Professional Engineer (Mechanical), California License No. M 32883, Exp. 9/30/2014

Professional Experience

2001-Current—Senior Mechanical Engineer – Siting, Transmission, and Environmental Protection Division – California Energy Commission

- Perform analysis of generating capacity, system reliability and safety, energy efficiency, noise and vibration, jurisdictional determination, and the mechanical, civil, electrical, and structural aspects of power plants during licensing, construction, and operation.

- As the Facility Design Unit's lead, or senior, review and manage the work of technical staff (other engineers) and contractors; ensure project deadlines are met; and ensure that projects propose and implement the most energy efficient technologies to satisfy project objectives while protecting the environment;

- Independently review and evaluate Applications for Certification to ensure compliance of power plants and related facilities with applicable laws, ordinances, regulations, and standards and California Environmental Quality Act, or CEQA;

- Prepare and recommend to the Siting Committee, conditions of certification (including mitigation measures) under which power plants should be licensed, constructed and operated;

- Present oral and written expert testimonies in support of analysis at evidentiary hearings held before the Siting Committee and the public; and

- Assist the California Energy Commission in policy making related to power generation.

1998-2001—Structural Engineer – Rankin & Rankin

Engineered concrete foundations, structural steel and sheet metal of various building structures including energy related structures such as fuel islands. Performed energy analysis/calculations of such structures and produced both structural plans and detailed shop drawings using AutoCAD.

1995-1998—Manufacturing Engineer – Carpenter Advanced Technologies

Managed manufacturing projects of various mechanical components used in high tech medical and engineering equipment. Directed inspection of first articles. Wrote and implemented QA/QC procedures and occupational safety procedures. Conducted developmental research of the most advanced manufacturing machines and processes including writing of formal reports. Developed project cost analysis. Developed/improved manufacturing processes.

DECLARATION OF

Dr. Obed Odoemelam

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

1. I am presently employed by the California Energy Commission in the Facilities Siting Office of the Systems Assessments and Facilities Siting Division as a Staff Toxicologist.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I helped prepare the staff testimony and errata on **Public Health** and **Transmission Line Safety and Nuisance** for the **El Segundo Energy Center Amendment (00-AFC-14C)** based on my independent analysis of the Application for Certification and supplements thereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony and errata is valid and accurate with respect to the issue addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and errata and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: 9/29/14 Signed: Odoemelam

At: Sacramento, California

RESUME

DR. OBED ODOEMELAM

EDUCATION:

1979-1981 University of California, Davis, California. Ph.D., Ecotoxicology

1976-1978 University of Wisconsin, Eau Claire, Wisconsin. M.S., Biology.

1972-1976 University of Wisconsin, Eau Claire, Wisconsin. B.S., Biology

EXPERIENCE:

1989
The Present: California Energy Commission. Staff Toxicologist.

Responsible for the technical oversight of staffs from all Divisions in the Commission as well as outside consultants or University researchers who manage or conduct multi-disciplinary research in support of Commission programs. Research is in the following program areas: Energy conservation-related indoor pollution, power plant-related outdoor pollution, power plant-related waste management, alternative fuels-related health effects, waste water treatment, and the health effects of electromagnetic fields. Serve as scientific adviser to Commissioners and Commission staff on issues related to energy conservation. Serve on statewide advisory panels on issues related to multiple chemical sensitivity, ventilation standards, electromagnetic field regulation, health risk assessment, and outdoor pollution control technology. Testify as an expert witness at Commission hearings and before the California legislature on health issues related to energy development and conservation. Review research proposals and findings for policy implications, interact with federal and state agencies and industry on the establishment of exposure limits for environmental pollutants, and prepare reports for publication.

1985-1989 California Energy Commission.

Responsible for assessing the potential impacts of criteria and noncriteria pollutants and hazardous wastes associated with the construction, operation and decommissioning of specific power plant projects. Testified before the Commission in the power plant certification process, and interacted with federal and state agencies on the establishment of environmental limits for air and water pollutants.

1983-1985 California Department of Food and Agriculture.

Environmental Health Specialist.

Evaluated pesticide registration data regarding the health and environmental effects of agricultural chemicals. Prepared reports for public information in connection with the eradication of specific agricultural pests in California.

DECLARATION OF
James Adams

I, **James Adams**, declare as follows:

1. I am presently employed by the California Energy Commission in the Siting, Transmission and Environmental Protection Division as a **Socioeconomics Planner II Analyst.**

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I helped prepare the staff testimony on **Socioeconomics**, for the **El Segundo Energy Center Amendment (00-AFC-14C)**, based on my independent analysis of the Petition to Amend and supplements thereto, data from reliable documents and sources, and my professional experience and knowledge.

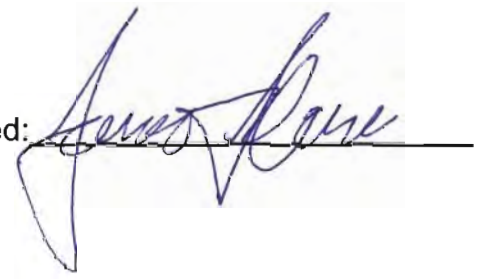
4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue(s) addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and, if called as a witness, could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: 9/25/2014

At: Sacramento, California

Signed: 

James S. Adams
Environmental Protection Office
California Energy Commission
1516 Ninth Street
Sacramento, CA 95814-5504
PH (916) 653-0702, FAX (916) 654-3882
Jim.Adams@energy.ca.gov

5/1999
Present **Environmental Planner**
Review applications for certification to acquire permits from the California Energy Commission to build electric generating power plants. Specific technical fields include socioeconomics and traffic and transportation.

11/1997
Present **Energy and Resource Consultant**
Provide clients with technical expertise on various issues related to natural resource use and development. Current activities include managing an Intervention by the Redwood Alliance before the California Public Utilities Commission regarding the decommissioning of the Humboldt Bay Power Plant's nuclear reactor.

9/1994--
10/1997 **Senior Analyst - Safe Energy Communication Council (SECC)**
Responsible for developing and/or implementing campaigns on various energy issues involving the promotion of energy efficiency and renewable energy and advocating less reliance on nuclear power. Managed educational outreach efforts to newspaper editorial writers throughout the U.S. to encourage coverage of energy issues. Participated in meetings and negotiations with key Clinton administration officials, members of Congress and staff, national coalitions, and grassroots organizations on important energy issues (e.g. U.S. Department of Energy Budget for Fiscal Years 1996-1998). Successfully raised $140,000 from private foundations to support SECC activities.

6/1978--
12/1992 **Principal Consultant - Redwood Alliance**
Provided consulting services to the Alliance; a renewable energy/political advocacy organization. Major responsibilities included managing and/or participating in several interventions/appearances before the California Public Utilities Commission, California Energy Commission, California Legislature, U.S. Congress and the U.S. Nuclear Regulatory Commission. Issues included electric utility planning options, greater reliance on energy efficiency and renewable energy, nuclear power economic analyses, decommissioning cost estimates, and nuclear waste management and disposal.

2/1983--
8/1986 **Natural Resource Specialist**

Assisted private consulting, firms, non-profit corporations and government agencies in various projects related to the enhancement and protection of national forests in Northern California and Southern Oregon. This included contracts with the U.S. Forest Service, Fish and Wildlife Service, National Park Service, the California Coastal Conservancy, and private landowners.

6/1978--
1999 Consultant/Journalist/Paralegal/Lobbyist

Throughout the period of work outlined above, I have written a considerable amount of news articles and reports connected to ongoing-projects and issues of personal interest. The leg, al/administrative interventions have required extensive paralegal work to support attorneys, and technical expertise to identify and assist consultants. In addition, many of the projects required consulting services and lobbying, at the local, state and federal level whenever necessary, as well as working with the print and television media as appropriate.

From 1978 through 1984 1 served on the Board of Directors for two locals non-profit agencies devoted to sustainable community development, Redwood Community Development Council and Redwood Community Action Agency (RCAA). I also was hired on staff at RCAA as a natural resource specialist which is explained more fully above. I am proficient with computers, printers, fax machines and related equipment.

EDUCATION

M.A. Social Science. Political science and natural resources emphasis. California State University at Humboldt. Graduated December 1988.

B.A. Political Science. Political and economic aspects of natural resource development, with a particular emphasis in forest ecology and appropriate technology. California State University at Humboldt. Graduated June 1978.

Academic
Honors. Member of PI GAMMU MU Honor Society since 1986.

MILITARY SERVICE

7/1969--
9/1975 U.S. Navy. Air Traffic Controller.
Honorable Discharge.

DECLARATION OF
Lisa Worrall

I, **Lisa Worrall**, declare as follows:

1. I am presently employed by the California Energy Commission in the Siting, Transmission and Environmental Protection Division as a **Planner II, Socioeconomics**.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I helped prepare the staff testimony on **Socioeconomics**, for the **El Segundo Energy Center Amendment (00-AFC-14C)**, based on my independent analysis of the Petition to Amend and supplements thereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue(s) addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and, if called as a witness, could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: 9/12/14

Signed: Lisa Worrall

At: Sacramento, California

LISA WORRALL

Summary

- Over eleven years of environmental analysis experience.
- Preparation of environmental documents in compliance with the California Environmental Quality Act (CEQA), National Environmental Policy Act (NEPA), California Energy Commission siting regulations, and federal, state and local laws, ordinances, regulations and standards (LORS).
- Projects include thermal power plants, private residential and commercial development, county and public works, and state transportation.

Employment Experience

California Energy Commission
Planner II Sacramento, California
January 2010 to Present

- Prepare an independent CEQA analysis of the environmental impacts from thermal power plants related to land use and socioeconomics.
- Evaluate projects in accordance with CEQA, the California Energy Commission siting regulations, and federal, state and local LORS.
- Review information provided by the project applicant and other resources to assess the environmental effects of energy facility proposals

Sacramento County Department of Environmental Review & Assessment
Associate Environmental Analyst Sacramento, California
April, 2006 – May, 2009

- Prepared a variety of environmental documents in compliance with CEQA, NEPA and local, state and federal LORS.
- Conducted project site assessments, reviewed engineering plans, and researched and interpreted scientific data for project impact analysis.
- Managed multiple public works and private development projects with a variety of environmental concerns and overlapping deadlines.
- Maintained effective relationships with other Sacramento County departments, agencies, and service providers to ensure comments and recommended conditions of project approval were obtained and any associated environmental impacts assessed.

Analytical Environmental Services Sacramento, California
Associate April, 2004 – October, 2005

- Interpreted highly technical traffic impact studies, utilizing the information to develop a traffic impact assessment chapter for use in a variety of environmental documents complying with CEQA, NEPA, and county and city transportation policies and codes.
- Managed the preparation of traffic studies, including developing the scope of study, securing the contract, and reviewing the work product.
- Managed multiple private development projects simultaneously under tight deadlines. Clients included Native American tribes and cities.
- Coordinated with state, county and city officials in the development of traffic study methodology, parameters and assumptions for proposed projects.

- Worked closely with transportation engineers to understand the complexities of each project's specific traffic impacts.

California Department of Transportation (Caltrans) Fresno, California
Associate Environmental Planner March, 2003 – March, 2004
Environmental Planner August, 2000 – March, 2003

- Prepared all levels of environmental documentation for transportation projects in compliance with CEQA and NEPA.
- Coordinated and interpreted environmental technical studies for incorporation into the environmental document and for explanation to other team members, agencies, and the public.
- Managed and represented environmental concerns with other functional units.
- Led and participated in public outreach events.
- Coordinated project development with other Caltrans departments, agencies and the public.

Education

California State University, Northridge May, 2000
Bachelor of Arts in Geography

DECLARATION OF
Mike Conway

I**, Mike Conway**, declare as follows:

1. I am presently employed by the California Energy Commission in the Siting, Transmission and Environmental Protection Division as an **Engineering Geologist, specializing in water resources.**

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I helped prepare the staff testimony on **Soil and Water Resources**, for the **El Segundo Energy Center Amendment (00-AFC-14C)**, based on my independent analysis of the Peition to Amend and supplements thereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue(s) addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and, if called as a witness, could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: 9-12-14

Signed: Mike Conway

At: Sacramento, California

Resume For: Mike Conway

Education: Master of Science in Geology, California State University, Sacramento, Spring 2012
Bachelor of Science in Geology, University of California, Davis, August 2003.

Certifications: California Professional Geologist (PG), no. 9107
Certified Professional in Erosion and Sediment Control (CPESC)
Certified Erosion, Sediment and Storm Water Inspector (CESSWI)
Leadership in Energy and Environmental Design Accredited Professional (LEED AP)

Experience:

Engineering Geologist: California Energy Commission, Sacramento, CA 2009

- Conduct analyses of soil and water resource reports submitted to Commission
- Assess impacts to soil and water resources from construction and operation of energy producing facilities
- Perform onsite evaluations of soil and water resources pre and post-project
- Implement a CEQA-like review of proposed energy projects to evaluate environmental impacts

Environmental Scientist: Central Valley Water Board, Rancho Cordova, CA 2009

- Wrote municipal storm water permits for Phase I communities in the Central Valley
- Reviewed storm water annual reports for Phase I and II municipalities
- Conducted audits of industrial sites for compliance with storm water permits
- Conducted audits of municipalities for compliance with municipal permits
- Help communities better understand how to effectively implement storm water programs
- Represented Water Board in large technical workshops and other public forums

Environmental Consultant: Wood Rodgers, Inc., Sacramento, CA 2006-2009

- Consulted clients on how to comply with Federal, State and local storm water quality and environmental regulations
- Helped public and private sector clients gain State Water Resources Control Board (SWRCB) permit coverage under Large and Small MS4 General Permits, NPDES Permits, CWA Section 401 Permits
- Consulted clients on Army Corps of Engineers, 404 Permitting
- Developed a storm water quality manual for Yolo County
- Prepared Caltrans environmental documentation and design for all project phases
- Prepared Storm Water Management Plans (SWMP) and Storm Water Pollution Prevention Plans (SWPPP)
- Drafted water pollution control exhibits using both AutoCAD and MicroStation
- Prepared Caltrans Storm Water Data Reports including cost estimates
- Designed landscaping plans for Caltrans' Modesto Ramp Rehabilitation Project
- Prepared Spill Prevention Control and Countermeasure (SPCC) plans
- Created Hazardous Materials Business Plan for City of Fort Bragg, California
- Facilitated multiple storm water quality training workshops for groups up to 20 plus

Storm Water Quality Consultant: Envirosafety Services, Elk Grove, CA 2004-2006

- Wrote site specific SWPPPs to include guidance specific to city, county, and geographical constraints
- Designed BMP exhibits using AutoCAD
- Conducted inspections at construction sites throughout the Central Valley for (SWPPP) compliance
- Resolved storm water compliance issues in cooperation with site superintendents, county and city inspectors
- Researched current storm water protection regulations to best protect clients

Post-Graduate Researcher: Dept. of Land, Air, and Water Resources, U.C. Davis, CA 2003

- Studied the effects of irrigation practices on wetland ecology and water quality
- Independently organized monthly analyses and data processing of selenium contaminated invertebrate, algae, and water samples from the Tulare Lake Drainage District
- Managed concentrated acids, carcinogenic solutions, and final fluorescence measurements
- Compiled research data and presented findings to a team of eight colleagues

Lab Technician: Raney Geotechnical Laboratory, West Sacramento, CA 2001

- Conducted moisture density, unconfined compression tests, Atterburg Limit, curve, plasticity tests, and basic calculations for soil samples
- Administered load tests on concrete cylinders and mortar samples
- Performed percolation tests and Dynamic Cone Penetrator (DCP) tests in the field and gathered water samples for environmental analysis

DECLARATION OF
Jonathan Fong

I, **Jonathan Fong**, declare as follows:

1. I am presently employed by the California Energy Commission in the Siting, Transmission and Environmental Protection Division as an **Planner III (EFS).**

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I helped prepare the staff testimony on **Traffic and Transportation**, for the **El Segundo Energy Center Amendment (00-AFC-14C)**, based on my independent analysis of the Peition to Amend and supplements thereto, data from reliable documents and sources, and my professional experience and knowledge.

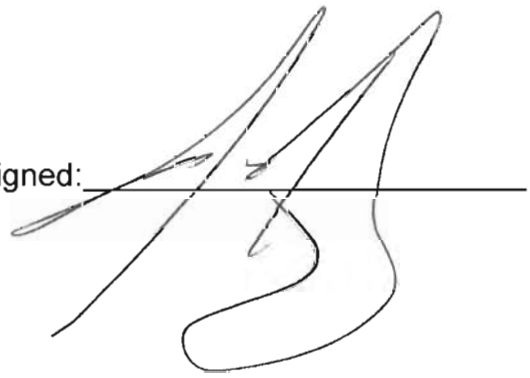
4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue(s) addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and, if called as a witness, could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: 9/16/2014

At: Sacramento, California

Signed: 

Jonathan Fong

Jonathan.Fong@energy.ca.gov

EDUCATION

University of California, Irvine Graduated June 2005

- Environmental Analysis and Design, Specialization in Planning and Policy Studies

WORK EXPERIENCE

California Energy Commission
Environmental Protection Unit, Planner II- August 3, 2013 to present
Responsible for reviewing thermal power plants regulated by the State of California. As a technical expert in Land Use and Transportation and Traffic, I evaluate projects and determine potential impacts in accordance with federal, state and local regulations. Prepare expert testimony evaluating project compliance and proposed mitigation measures to reduce impacts. Regularly attend public workshop and provide expert testimony on staff analysis.

The Lyle Company
Site Acquisition and Zoning Specialist, Team Lead- January 2010 to November 2011
Working in the wireless telecommunications industry, I lead a small group of personnel in permitting projects for major wireless carriers. I gained extensive experience working with engineers and other technical staff in order to meet strict jurisdiction requirements and which met client goals. I have extensive experience using database software for project tracking through assignment to completion. I have developed the ability to review complex drawings and technical documentation as well as team leadership skills. I would routinely present projects at public hearings to decision makers as well as work with the public to explain project details and develop alternatives for contentious sites.

County of El Dorado
Planning Services, Associate Planner - October 2005 to January 2010
Land Use Planning Project Planner. Responsible for processing complex discretionary projects such as tentative subdivision maps, general plan amendments, including wireless telecommunications projects. As project planner I was in charge of preparing policy review in staff reports and CEQA review. I have developed an extensive background in reviewing general plan policies and local ordinances. Responsible for preparing staff reports and presentations for public hearing.

City of Santa Ana
Planning and Building Agency, Planning Intern- November 2004 to August 2005
As member of the Regional and Advance Planning Team assisted planners on long range documents and policy. Reviewed plans for various residential and commercial developments in the city. Worked independently and in different teams to perform various planning duties. Used GIS to produce maps as well as Access to prepare databases for reports. Responsible for creating, maintaining and updating various databases of city resources.

Jones and Stokes
Environmental Analysis Team, Student Intern – June 2004 to August 2004
Assisted the Environmental Analysis team with gathering data and writing reports. Wrote elements of Regional Master Plan for the State of Wyoming. Attended Jones and Stokes in-house training seminar on CEQA guidelines and issues with cumulative impacts.

DECLARATION OF
William Kanemoto

I, **William Kanemoto**, declare as follows:

1. I am presently under contract with Aspen Environmental Group to provide environmental technical assistance to the California Energy Commission. Under Contract No. 700-11-027, I am serving as a Visual Resource Specialist to provide Peak Workload Support for the Energy Facility Siting Program and for the Energy Planning Program.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I helped prepare the staff testimony on **Visual Resources** for the **El Segundo Energy Center Amendment (00-AFC-14C)**, based on my independent analysis of the Petition to Amend and supplements thereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue(s) addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and, if called as a witness, could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: 9/12/14

Signed: 

At: Sacramento, California

William Kanemoto

Principal Investigator, Visual Analysis and Visual Simulation

Professional Experience:

Principal
William Kanemoto & Associates, Oakland, California, 1993 - Present

William Kanemoto is Principal of William Kanemoto & Associates, an environmental consulting practice specializing in visual analysis and computer visualization in the context of environmental review. He has served as principal investigator for visual analysis and simulation on a wide range of major infrastructure and development projects over the past 26 years. Mr. Kanemoto received an *Outstanding Performance Award from the California Energy Commission* for his visual analysis of numerous major power plant applications on behalf of the CEC between 2000 and 2002. He also received recognition from the *California Association of Environmental Professionals* for visual analysis, computer simulation, animation, and video production for the Stanford Sand Hill Road Projects EIR, prepared by EIP Associates and judged 'Best State-Wide EIR of 1997'

Associate Director
Environmental Simulation Laboratory,
Institute of Urban and Regional Development &
Center for Environmental Design Research
University of California, Berkeley, 1994 - 2000

Instructed graduate students in the College of Environmental Design, U.C. Berkeley, served as consultant on various major planning projects in the San Francisco Bay Area, and conducted design collaborations with counterparts at Keio University and ARK CyberUniversity in Tokyo, Japan via the internet.

Principal Investigator/Project Manager
Dames & Moore, San Francisco/Oakland, California, 1988-1992

Served as principal investigator of numerous visual analyses for major infrastructure projects throughout the U.S., in Europe, and in Asia. Gained extensive familiarity with the application of a wide range of professionally accepted visual assessment techniques in the context of CEQA, NEPA, and related regulatory requirements of the CPUC, CEC, FERC, DOT, Cal SHPO, BCDC, U.S. Forest Service, BLM, National Park Service, and other public agencies.

Project Manager
LSA Associates, Pt. Richmond, California, 1987-1988

Project manager and planner on environmental impact reports for various residential and commercial development projects in northern California.

Environmental Planner
Holton Associates, Berkeley, California, 1984-1987

Preparation of various resource and regulatory studies including EIRs, FERC Exhibit Es, Section 404 alternative analyses, riparian restoration studies, and cumulative impact methodology studies for EPRI and Sierra County, CA.

Academic Background:

M. Landscape Architecture, University of Michigan, Ann Arbor, 1982
B.A. Liberal Arts (Honors), University of California, Santa Cruz, 1973

Selected Relevant Experience

- *Visual Analysis, Rio Mesa Solar Project.* Visual analysis for CEC Preliminary Staff Assessment of solar thermal project in Riverside County.
- *Visual Analysis, California Energy Commission*. Visual analysis, expert witness testimony for environmental review of numerous major power plant applications throughout California. Conducted visual analysis for staff assessment of 6 'fast-track' thermal solar power plant applications in 2009 – 2010, and of numerous other applications since 2001.
- *Topaz Solar Project EIR.* San Luis Obispo County. Visual analysis of solar PV project in Carizzo Plain.
- *Fresno to Bakersfield High Speed Train EIR/S.* California High-Speed Rail Authority. Prepared visual analysis and 20+ simulations for the Fresno to Bakersfield High Speed Train Fresno to Bakersfield EIR/S.
- *Santa Rosa Incremental Recycled Water Program.* Visual simulations of a wide range of water treatment, storage, conveyance, and injection facilities were prepared at locations throughout Sonoma County.
- *Las Gallinas Water Storage EIR, Marin MWD.* Visual analysis and simulation.
- *Shaver Grade Pipeline Improvements*, Marin MWD. Visual simulations.
- *Tennessee Hollow Watershed Restoration EA,* Presidio National Park, GGNRA, San Francisco
- *Ventura Keys and Arundell Barranca Watershed Water Quality Improvements Video*. A video incorporating live footage and computer visualization was produced and presented in public meetings, on cable television, and distributed publicly on tape cassette.
- *Alta Infill II Wind Power Project EIR.* Visual analysis and simulation of wind project adjoining BLM lands within the Tehachapi Wind Resource Area.
- *Visual Impact Assessment Technical Reports*, Caltrans District 4. On-call visual analysis for numerous highway improvement projects throughout District 4.
- *San Onofre Nuclear Generating Station Steam Generator Replacement EIR,* CPUC
- *Diablo Canton Nuclear Generating Station Steam Generator Replacement EIR,* CPUC
- *BART to Silicon Valley EIR/S,* BART/SCVTA. numerous computer simulations of proposed BART Stations and associated facilities in Milpitas, downtown San Jose, and Santa Clara. Tasks included realistic simulation of then-unbuilt San Jose City Hall, from design drawings of Meier and Partners, and recently completed simulations of proposed Diridon Station parking structure, BART station, and future environs.
- *Encinal Project,* Oakland CA. Visual analysis, computer simulations, and computer-generated shadow studies for a proposed high-rise project in downtown Oakland. Study included 3D computer baseline modeling of a 20-block area of downtown Oakland.
- *Santa Clara Street-Alum Rock LRT/BRT Project,* SCVTA. Produced visual analysis and computer simulations of proposed LRT line from downtown San Jose to Capitol Avenue.
- *Highway 152/156 Interchange Project VIA*. Produced visual impact assessment technical report per Caltrans requirements, and computer simulations of a new interchange project in southern Santa Clara County for SCVTA.
- *Tasman Light Rail/Great Mall Station, Santa Clara County*. Prepared computer simulations of a proposed elevated light rail station for the Santa Clara Valley Transportation Agency.
- *Capitol Safety Barrier EIR*, Sacramento, CA. Prepared computer simulations of proposed barrier and entrance structure designs surrounding the State Capitol, to address concerns of visual compatibility with the highly sensitive historic landmark.
- *Stanford University Medical Center Improvements, Stanford Shopping Center Improvements EIR.* Computer simulations of two major projects on Stanford campus.
- *Stanford West/Sand Hill Road Projects EIR*, Stanford University. Visual analysis and extensive computer simulation of a 300+ unit apartment complex, a 680 + unit senior housing development and health center, major improvements to the Stanford Shopping Center, and construction of a major arterial roadway, for the City of Palo Alto. Computer animation and video presentation of Sand Hill Road projects were produced for presentation at public hearings and on cable TV.

DECLARATION OF
Ellie Townsend-Hough

I, Ellie Townsend-Hough, declare as follows:

1. I am presently employed by the California Energy Commission in the Siting, Transmission and Environmental Protection Division, as an Associate Mechanical Engineer.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I prepared the staff testimony for the **Waste Management Analysis** for the **El Segundo Energy Center Amendment** (**00-AFC-14C**) based on my independent analysis of the Proposed Amendment, and supplements thereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue(s) addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: September 12, 2014

Signed: 

At: Sacramento, California

Ellen Townsend-Hough

SUMMARY

I am a chemical engineer with 30 years of experience. My professional career has afforded me many unique growth and development opportunities. I have a working knowledge of the California Environmental Quality Act. My strengths are in analyzing and performing complex environmental engineering analyses, in areas such as Waste Management, Hazardous Materials Management, Worker Safety and Fire Protection, and Water Resources. I worked as a policy advisor to a California Energy Commissioner. I am also an US Environmental Protection Agency Environmental Justice trainer.

PROFESSIONAL EXPERIENCE

Technical Analysis and Presentation

- Provide analysis on projects that require compliance with the Resource conservation and Recovery Act (RCRA) Title 40 CFR Subtitle C and Subtitle D, the Comprehensive Environmental Response, compensation and Liability Act, Title 42, USC, Section 9601, the Unified Hazardous Waste and Hazardous Materials Management Regulatory Program, Title 27, the Hazardous Waste and Management Review, Title 24 Building Efficiency Standards: Title 22 and the Integrated Waste Management Act, Title 14.

- Works on Department of Toxic Substance Control (DTSC) Closure Plans,

- Establishes Construction and Demolition (C&D) Standards for power plants under renovation, recycling, using Title 24,

- Performs mechanical engineering analysis of designs for complex mechanical engineering analysis of designs for systems such as combustion chambers and steam boilers, turbine generators, heat transfer systems, air quality abatement systems, cooling water tower systems, pumps and control systems

- Review and process compliance submittals in accordance with the California Environmental Quality Act, the Warren Alquist Act, the Federal Clean Air Act and the California and Federal Occupational Health and Safety Acts to assure compliance of projects

- Provides licensing recommendations and function as an expert witness in regulatory hearings.

- Provide public health impact analysis to assess the potential for impacts associated with project related air toxic/non-criteria pollutant emissions.

- Evaluate the potential of public exposure to pollutant emissions during routine operation and during incidents due to accidents or control equipment failure

- Provide an engineering analysis examining the likelihood of compliance with the design criteria for power plants and also examine site specific potential significant adverse environmental impacts

Technical Skills

- Deal with the aftermath of improper hazardous waste management by overseeing site cleanups.

- Prevent releases of hazardous waste by ensuring that those who generate, handle, transport, store and dispose of wastes do so properly.

- Take enforcement actions against those who fail to manage hazardous wastes appropriately.

- Explore and promote means of preventing pollution and encourage reuse and recycling.
- Evaluate soil, water and air samples taken at sites and develop new analytical methods.
- Practice other environmental sciences, including toxicology, risk assessment, and technology development.
- Establish mitigation that reduces the potential for human exposure to levels which would result in significant health impact or health risk in any segment of the exposed population.
- Assist with on-site audits and inspection to assure compliance with Commission decisions.
- Review and evaluate the pollution control technology applied to thermal power plants and other industrial energy conversion technologies.
- Work with the following software applications: WORD, Excel, and PowerPoint.

Policy Advisor

- Provided policy, administrative and technical advice to the Commissioner Robert Pernell. My work with the Commissioner focused on the policy and environmental issues related to the Commission's power plant licensing, research and development and export programs.
- Track and provide research on varied California Energy Commission (CEC) programs. Prepare analysis of economic, environmental and public health impacts of programs, proposals and other Commission business items.
- Represent Commissioner's position in policy arenas and power plant siting discussions.
- Write and review comments articulating commission positions before other regulatory bodies including Air Resources Board, California Public Utilities Commission, and the Coastal Commission.
- Wrote speeches for the Commissioner's presentations.

Writing

- Write environmental impact reports, negative declarations that require technical evaluation of mechanical engineering and environmental aspects of pollution control systems, environmental impacts, public health issues and worker safety.

EDUCATION

Bachelor of Science, Chemical Engineering
Drexel University, Philadelphia Pennsylvania

Continuing Education

Hazardous Material Management Certificate, University California Davis
Urban Redevelopment and Environmental Law, University of California Berkley
Analytical Skills, California Department of Personnel Administration (DPA) Training Center
Legislative Process/Bill Analysis, DPA Training Center
Federally Certified Environmental Justice Trainer

DECLARATION OF
Edward James Brady

I, **Edward Brady**, declare as follows:

1. I am presently employed by the California Energy Commission in the Siting, Transmission and Environmental Protection Division as a Mechanical Engineer.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I helped prepare the staff testimony on **Facilities Design, Power Plant Efficiency, Power Plant Reliability**, and **Noise** for the **El Segundo Energy Center Amendment (00-AFC-14C)**, based on my independent analysis of the Petition to Amend and supplements thereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue(s) addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and, if called as a witness, could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: 9/29/14

Signed: Edward Brady

At: Sacramento, California

Edward James Brady
Mechanical Engineer

Summary of Experience

Forty years of experience in the profession of mechanical engineering as a staff engineer to the California Energy Commission, engineering consultant, design group supervisor in a major power plant project, senior engineer for a gas and electric utility, sales and design engineer for a contractor, and instructor in a community college.

Education

- BSME, Santa Clara University, 1972
- Graduate Engineering Studies, Santa Clara University
- Graduate Business Studies, University of San Francisco
- Continuing Education, UC Extension

Professional Registration

- Mechanical Engineer (M17924) California
  (25505) Washington
  (33082) Colorado
  (9248, Inactive) Nevada
- Civil Engineer (C36194) California

Affiliations

- American Society of Mechanical Engineers (ASME), Member
- American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE), Member
- International Code Council (ICC), Member
- International Association of Plumbing and Mechanical Officials (IAPMO), Member
- National Fire Protection Association (NFPA), Member

Curriculum Vitae

2011 – Present	**Staff Mechanical Engineer**, California Energy Commission, Siting, Transmission, and Environmental Protection Division (STEP). Performs analysis of generating capacity, reliability, efficiency, noise and vibration, and the mechanical, civil, electrical, and structural aspects of power plant siting and construction cases.
1988-2011	**Principal Mechanical Engineer,** Brady Engineering. Provided design and consulting services for the permitting and construction of industrial and commercial facilities, and residential buildings in the fields of heating, ventilating air conditioning (HVAC), plumbing, fire protection and energy analyses.
1984-1988	**Design Group Supervisor,** Joint PG&E and Bechtel Project. Worked as the mechanical group supervisor responsible for the design modifications required for the licensing of Diablo Canyon Power Plant, Units 1 and 2.
1980-1988	**Senior Mechanical Engineer,** PG&E Civil Engineering Department, Architectural Section. Provided work group supervision and design of building mechanical systems for common utility plant facilities (CUP) and balance of plant systems for power production facilities.
1977-1980	**Mechanical Engineer,** PG&E Civil Engineering Department, Architectural Section. Provided HVAC and plumbing design for CUP and power production facilities.
1974-1977	**Instructor,** San Francisco Community College District, John O'Connell Evening School. Provided apprenticeship training in the technical fields of HVAC and refrigeration.
1977	**Design Engineer,** Charles and Braun Consulting Engineers, San Francisco. Worked as a staff designer in the fields of HVAC and plumbing for commercials facilities include a sentence detention facilities and a proto-type regional facility for a federal agency.
1972-1976	**Sales and Design Engineer,** Scatena York Company, San Francisco. Worked as a sales and design engineer for a refrigeration contractor, which provided design and installation of refrigeration systems for supermarkets and cold storage facilities.

Power Plant/Utility Experience

California Energy Commission, Rio Mesa Solar Electric Generation Station (RMSEGS). 500 MW Solar Power Tower. Riverside County

, Hidden Hills Solar Electric Generating Station (HHSEGS). 500 MW Solar Power Tower. Inyo County.

, Hydrogen Energy California (HECA). 405 MW Combined Cycle, Fuel Gasification, CO_2 Sequestration, Ammonia Production. Kern County

, Quail Brush Generating Project (QBGP). 1100 MW Reciprocating Engine Electric Generation. City of San Diego

, Huntington Beach Energy Project (HBEP). 939 MW Combined Cycle. City of Huntington Beach.

, Redondo Beach Energy Project (RBEP). 496 MW Combined Cycle. City of Redondo Beach, Los Angeles County.

PG&E , Diablo Canyon Power Plant, Units 1 and 2. Licensing of safety related systems.
, Diablo Canyon Power Plant, Administration Building, SLO County Emergency Response Building

, Geysers Power Plant, Units 16, 17, 20, and 21. Ventilation and cooling for turbine building and hazardous waste disposal facilities, administration building.

, Helms Pumped Storage Facility, Kern County. Smoke control ventilation for underground transformer vaults.

, Humboldt No. 3, Eureka. Decommissioning of nuclear facility and construction of hazardous materials storage and handling.

, Moss Landing Power Plants, Units 1 through 6, Monterey County

, Morro Bay Power Plant, Morro Bay

, Hunters Point Power Plant, San Francisco

, Potrero Power Plant, San Francisco. Combined Cycle

, Gas Transmission Facilities, Line 300 and 400, Topock and Corning Compressor Stations, McDonald Island and Brentwood Gas Storage Facilities

, Central Computer Facilities, San Francisco and Vacaville

, 77 Beale Street, San Francisco. Energy Management System

, 215 Market Street, San Francisco. Boiler Replacement

, Underground Fuel Tank Replacement. Upgrade of more than 500 gallon fuel storage tanks to meet double containment requirements.

, Contra Costa Power Plants, Unit 1 through 6, Water Treatment

, Pittsburg Power Plants, Unit 1-5, Water Treatment Facilities

, Avon, Martinez and Oleum (AVO), Water Treatment Upgrade

, Tiger Creek Powerhouse, North Fork Feather River

, Kirchoff No. 2 Pump Storage Facility.

, Technical Support Services, Marketing Department

South Bay Sanitary Authority, 1400 Radio Road, Redwood Shores. Gas piping and boiler conversion.

DECLARATION OF
Casey Weaver

I, **Casey Weaver**, declare as follows:

1. I am presently employed by the California Energy Commission in the Siting, Transmission and Environmental Protection Division as an **Engineering Geologist analyzing geologic hazards and geologic, mineralogic and paleontologic resources.**

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I helped prepare the staff testimony on **Geology and Paleontology**, for the **El Segundo Energy Center Amendment (00-AFC-14C)**, based on my independent analysis of the Peition to Amend and supplements thereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue(s) addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and, if called as a witness, could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: 9/25/2014

Signed: _____

At: Sacramento, California

CASEY W. WEAVER, PG, CEG
1621 Delta Drive
Woodland, CA 95695
(530) 662-0482

SUMMARY OF EXPERIENCE:

Certified Engineering Geologist with over 20 years of environmental and geotechnical consulting experience. Experience includes remedial investigations and feasibility studies (RI/FS), groundwater investigations, corrective action plans, landfill studies (SWATs, siting, closure), preliminary environmental site assessments (PESA, Phase I), regulatory compliance (RCRA/CERCLA), geotechnical investigation/evaluation, geologic hazard evaluations, active fault evaluations, seismic studies, landslide evaluation/repair, foundation suitability studies, personnel management and business development.

EDUCATION:

B.S. Geology, Humboldt State University, Arcata, CA, 1981
University of California, Davis Extension Courses

REGISTRATIONS/LICENCES/CERTIFICATIONS:

Certified Engineering Geologist, California
Registered Geologist, California, Oregon, Arizona
Registered Environmental Assessor
OSHA 1910.120 Hazardous Waste Operations and Emergency Response - 40hr
OSHA 1910.120 Hazardous Waste Operations and Emergency Response - Supervising Operations at Hazardous Waste Sites.

PROFESSIONAL HISTORY:

2008 to Present **Engineering Geologist**
California Energy Commission, Sacramento, CA

Duties within the Geosciences Unit of the Engineering Office in the Siting, Transmission, and Environmental Protection Division include review and evaluation of applications for certification of thermal power plants within the state of California. The focus of the work is on sensitive project sites that may have issues involving geologic hazards, paleontological, mineralogical, groundwater and surface water resources, soil erosion, flooding potential, water quality and plant-derived waste generation and disposal. In addition, evaluate construction, operation and maintenance of the facilities and conduct investigations to determine if violations of the

program's regulations, the Energy Commission's conditions of certification, or the California Environmental Quality Act (CEQA) have occurred.

Selected as the Energy Commission's seismic expert and CEC's representative on the multi-jurisdictional Independent Peer Review Panel which reviews and provides comments to major utilities regarding their seismic investigations and evaluations conducted for California's nuclear power plants.

2001 to 2008

Engineering Geologist
State Water Resources Control Board, Headquarters, Sacramento, CA

With the UST Enforcement Unit, under direction from the State Attorney General's Office, conducted inspections of UST systems to evaluate compliance with 1998 upgrade requirements. This work culminated in the largest settlement of its kind in the nation's history. In addition, conducted surveillance of unlawful discharges from remediation systems and conducted investigations of UST Fund fraud cases.

With the USTCF Technical Review Unit, evaluated the technical elements of USTCF claims.

With the Division of Financial Assistance, assisted with the development of program policy for the Agricultural Water Quality Grant Program ($46 million) and the Integrated Water Quality Grant Program ($380 million), participated in stakeholder workshops, contributed to multijurisdictional work groups for program development and implementation.

With the Special Operations Unit of the Office of Enforcement, conducted investigations of operator misconduct, wrote enforcement investigation reports and prepared disciplinary letters.

1998 to 2001

Senior Engineering Geologist
BSK & Associates, Rancho Cordova, CA

Designed and directed hydrogeologic investigations for use with environmental remediation projects. Supervised field personnel installing groundwater monitoring wells, conducting aquifer tests & SVE pilot tests, reviewed reports and workplans, and conducted business development.

Conducted review of Alquist-Priolo active fault hazard reports as county geologist for Kern County.

1993 to 1998

Senior Geologist, Geoscience Team Leader and RI/FS Task Leader
LAW Engineering and Environmental Services, Inc., Sacramento, CA

As Geoscience Team Leader, responsible for career development, training and personnel management of ten employees. This group consisted of 3 senior-level geologists, 4 project level geologists and scientists, 2 junior level geologists and 1 technician.

As RI/FS Task Leader, responsible for the development of cost estimates/budgets, preparation of Work Plans and Sampling and Analysis Plans, management of field activities, data collection and documentation associated with the investigation of 15 Installation Restoration Program sites at Beale Air Force Base awarded under several Delivery Orders with combined project budgets of $18 million. Also responsible for aerial photographic interpretations associated with a basewide (23,000 acres), Preliminary Assessment, and preparation of a basewide Hydrogeologic Evaluation Report.

1990 to 1993

Senior Project Manger/General Manager
Earthtec, Ltd., Roseville, CA

Management of Environmental Department, business development, preparation of cost estimates and proposals, client and regulatory agency interface, supervision and training, report writing, technical review, budget management, and quality control. Initiated and supported the development of company's wetland and wildlife departments. Typical projects included preliminary site assessments, soil vapor studies, detailed hydrogeologic evaluations, waste plume delineations, and development of remediation alternatives associated with landfills, service stations, bulk oil facilities and other potentially contaminated sites.

1981 to 1990

Project Geologist
SHN Group, Inc. Eureka, CA

Managed project work directed toward solving environmental issues at variably contaminated sites and provided geotechnical information for land development and construction. Responsibilities included development of cost estimates/budgets, planned and supervised field operations, collected and interpreted subsurface information, evaluated areas traversed by Alquist-Priolo Special Studies Zones and sites subject to slope stability hazards. Typical projects included geotechnical evaluations and geologic hazard studies for major subdivisions, hospitals, schools, lumber companies, run-of-the-river

hydroelectric projects, underground storage tank sites, and solid waste landfills.

1979 to 1981 **Geologist/Seismologic Technician**
Woodward-Clyde Consultants, San Francisco, CA

Designed and operated a laboratory model to study surface effects of thrust faulting in connection with seismic evaluation studies for the PG&E Humboldt Bay nuclear reactor. In addition, installed and operated field seismographs in the Humboldt Bay region.

DECLARATION OF
Sudath Edirisuriya

I, **Sudath Edirisuriya**, declare as follows:

1. I am presently employed by **California Energy Commission** in the **Siting, Transmission and Environmental Protection Division** as an **Electrical Engineer**.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I prepared the staff testimony on **Transmission System Engineering**, for the **El Segundo Energy Center**, based on my independent analysis of the Application for Certification and supplements hereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issues addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: 09-26-2014 Signed: Sudath Edirisuriya.

At: Sacramento, California

Sudath A. Edirisuriya
1916 Ackleton Way
Roseville CA 95661 **Phone 916-654-4851**

EDUCATION:

Bachelor of Science in Electrical Engineering at California State University Fullerton

ATTAINMENTS:

Member of the Professional Engineers in California Government
Vice President Electrical Engineering Society-California State University Fullerton.

EXPERIENCE:

November-2001 to Present: - Associate Electrical Engineer, System Assessment and Facilities Siting Division, California Energy Commission.
Working in the Transmission System Engineering unit on licensing generation projects. Work involves evaluating generation interconnection studies (SIS and FS), their reliability and environmental impacts on transmission system, preparing staff assessment reports, presenting testimony. Perform reliability studies and coordinating data and technical activities with utilities, California ISO and other agencies. Conduct and perform planning studies and contingency analysis including power flow, short-circuit, transient, and post-transient analysis to maintain reliable operation of the power system. Understanding of regulatory and reliability guidelines, WECC and NERC planning and operation criteria, CPUC and FERC requirements. Review technical analyses for WECC/CA ISO/PTO transmission systems and proposed system additions; and provide support for regulatory filings.

June-1998 to November-2001: - Project Electrical Engineer, Design Electrical Engineering Section, Department of Transportation, California.
Electrical Engineering knowledge and skills in the design, construction and maintenance of California state work projects involving all the public work areas; contract administration, construction management, plan checking, field engineering and provide liaison with consultants, developers, and contractors. Plan review in facility constructions, highway lighting, sign lighting, rest area lighting, preparation of project reports, cooperative agreements, review plans for compliance of construction and design guide lines for national electrical code, standards and ordinance. Review process included breaker relay coordination, detail wiring diagrams, layout details, service coordination, load, conductor sizes, derated ampacity, voltage drop calculations, harmonic and flicker determination.

June-1993 to May-1998:- Substation Electrical Engineer, City of Anaheim, California.
Performed protective relay system application, design and setting determination in Transmission & Distribution Substation. Understanding of principles of selective coordination system protection and controls for Electric Utility Equipment. Understanding of Power theory and Analysis of symmetrical components. Ability to review engineering plans, specifications, estimates and computation for Electrical

Utility Projects. Practices of Electrical Engineering design, to include application of Electro-mechanical and solid state relays in Electrical Power Systems. Software skills in RNPDC (Fuse Coordination Program), Capacitor Bank allocation program, and GE Load Flow Program. Design projects using CAD, Excel spread sheets including cost estimates, wiring diagrams, material specifications and field coordination.

Performed underground service design 12kV and 4kV duct banks; pole riser; getaway upgrade; voltage drop calculation, ampacity calculation and wiring diagrams. Design and maintenance of substations in City Electrical Utility System. Upgrade Station Light and power transformers; upgrade capacitor banks; replacement of 12kV-4kV power circuits; Breakers at Metal Clad Switchgear. Design one-line diagrams; three line diagrams; grounding circuits; schematics; coordination of relay settings; conduit and material list preparation. Calculation of derated ampacity; inrush current, short circuit current.

DECLARATION OF
Mark Hesters

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

1. I am presently employed by the California Energy Commission in the Siting, Transmission and Environmental Protection Division as a Senior Electrical Engineer.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I helped prepare the staff testimony on **Transmission System Engineering**, for the **El Segundo Energy Center Amendment (00-AFC-14C)**, based on my independent analysis of the Peition to Amend and supplements thereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue(s) addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and, if called as a witness, could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: Sept 17/2014

Signed: 

At: Sacramento, California

Mark Hesters

916-654-5049
mark.hesters@energy.state.ca.us

Qualifications

- Analyzed the reliability impacts of electric power plants for nine years.
- As an expert witness, produced written and oral testimony in numerous California Energy Commission proceedings on power plant licensing.
- Expertise in power flow models (GE PSLF and PowerWorld), production cost models (GE MAPS), Microsoft word-processing, spreadsheet and database programs.
- Contributing author to many California Energy Commission reports.
- Represented the Energy Commission in the development of electric reliability and planning standards for California.

Experience

Senior Electrical Engineer

2005-Present California Energy Commission, Sacramento, CA

- Program manager of the transmission system engineering analysis for new generator Applications of Certification.
- Lead the development of transmission data collection regulations.
- Overhauled the transmission data adequacy regulations for the Energy Commission's power plant certification process.
- Participated in the analysis of regional transmission projects.
- Technical lead for Commission in regional planning groups.
- Energy Commission representative to the Western Electric Coordinating Council Operations Committee.

Associate Electrical Engineer

1998–2005 California Energy Commission, Sacramento, CA

- Lead transmission systems analyst for power plant licensing under 12-month, 6-month and 21-day licensing processes.
- Provided expert witness testimony on the potential transmission impacts of new power plants in California Energy Commission licensing hearings.
- Authored chapters for California Energy Commission staff reports on regional transmission issues.
- Studied the economics of transmission projects using electricity production simulation tools.
- Analyzed transmission systems using the GE PSLF and PowerWorld load flow models.
- Collected and evaluated transmission data for California and the Western United States

Electric Generation Systems Specialist

1990–1998 California Energy Commission, Sacramento, CA

- Lead generation planner for southern California utilities.
- Analyzed electric generation systems using complex simulation tools.
- Provided analysis on the impact of resource plans on air quality and electricity costs for California Energy Commission reports.
- Developed modeling characteristics for emerging technologies.
- Evaluated resource plans.

Education

1985–1989 University of California at Davis Davis, CA

- B.S., Environmental Policy Analysis and Planning

DECLARATION OF
Steven Kerr

I, **Steven Kerr**, declare as follows:

1. I am presently employed by the California Energy Commission in the Siting, Transmission and Environmental Protection Division as a Planner II.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

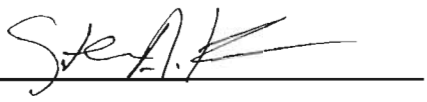
3. I helped prepare the staff testimony on **Alternatives**, for the **El Segundo Energy Center Amendment (00-AFC-14C)**, based on my independent analysis of the Petition to Amend and supplements thereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue(s) addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and, if called as a witness, could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: June 3, 2014

Signed: 

At: Sacramento, California

Steven Kerr

Professional Experience:

California Energy Commission — Sacramento, CA
January 2012-Present — *Planner II*

- Review power plant applications and amendments for alternatives, land use, socioeconomic, land use, transportation, and visual impacts.
- Evaluate projects in accordance with CEQA, the California Energy Commission siting regulations, and federal, state and local laws, ordinances, regulations, standards (LORS).
- Participate in public workshops and hearings regarding proposals.
- Write environmental analysis documents.

Thomas P. Kerr Inc. — Sacramento, CA
August 2011-January 2012 — *Property Manager*

- Management of properties and assets throughout California and Oregon.
- Assist in the preparation of mobile home park closure impact report for Port of San Luis.
- Use various software applications to produce and review billing and financial records.
- Work with local agencies to coordinate infrastructure improvements.

Ground(ctrl) — Sacramento, CA
February 2010-August 2011 — *Director of Customer Support*

- Coordinate and provide customer support for A-list musical artist fan clubs, online stores, e-mail marketing, ticketing, aggressive online marketing, and much more.
- Resolve escalated customer support issues, credit card disputes, and Better Business Bureau cases.
- Supervise and train customer support team members and interns.

City of Sacramento — Sacramento, CA
General Services Department — *Customer Service Representative*
July 2009-February 2010

- Perform concurrently multiple customer service related duties for all City of Sacramento departments by phone/email.
- Interpret and apply City regulations and procedures as applicable to billing, fees, and collections.
- Learn and explain the organization, procedure and operation details of the City.
- Use a variety of business software applications and assess maps.

City of Sacramento — Sacramento, CA
Development Services Department — *Assistant Planner*
February 2007-July 2009

- Project manager for various residential, commercial, industrial, and office development projects.
- Assist customers with zoning, design review, preservation, environmental, subdivision code, and sign questions, both at the public counter and by phone/email.
- Provide customers with required entitlement information, fee estimates, and accept applications for proposed development projects.
- Review applications and plans for consistency with City Codes, General Plan, and applicable community plans, specific plans and planned unit development guidelines.
- Present projects at community meetings and work with neighborhood association leaders on controversial projects.
- Write staff reports and conditions of approval.
- Present projects at Zoning Administrator, Planning Commission, and City Council public hearings.
- Research development and entitlement histories of parcels.

City of Atascadero — Atascadero, CA
Community Development Department — *Planning Intern*
March 2005-June 2006

- Prepare environmental review documents.
- Review business licenses and building permits.
- Draft letters and staff reports.
- Respond to questions from the public on planning and zoning related issues.
- Access and update information in GIS and Excel

Education:

2000-2005 California State Polytechnic University, San Luis Obispo, CA
Bachelor of Science in City and Regional Planning