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HUNTINGTON BEACH ENERGY PROJECT

Final Staff Assessment

May, 2014
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Edmund G. Brown Jr, Governor

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CALIFORNIA
ENERGY COMMISSION
1516 Ninth Street
Sacramento, CA 95814

http://www.energy.ca.gov/sitingcases/huntington_beach_energy/index.html

FELICIA MILLER
Project Manager

CHRIS DAVIS
Siting Office Manager

ERIC KNIGHT
Environmental Office Manager

MATTHEW LAYTON
Engineering Office Manager

ROGER E. JOHNSON
Deputy Director
Siting, Transmission and
Environmental Protection Division

ROBERT P. OGLESBY
Executive Director

HUNTINGTON BEACH ENERGY PROJECT (12-AFC-02)
FINAL STAFF ASSESSMENT
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EXECUTIVE SUMMARY

Testimony of Felicia Miller

INTRODUCTION

This Final Staff Assessment (FSA) is being published by the California Energy Commission staff for the Huntington Beach Energy Project (HBEP) and contains staff's final, independent, objective evaluation of the HBEP Application for Certification (12-AFC-2). The FSA examines engineering, environmental, public health, and safety aspects of the proposed HBEP project, based on the information provided by the applicant, government agencies, interested parties, independent research, and other sources available at the time the FSA was prepared. The FSA contains analyses and responses to comments similar to those normally contained in a Final Environmental Impact Report (FEIR) required by the California Environmental Quality Act (CEQA). When issuing a license, the Energy Commission is the lead state agency under CEQA and its process is functionally equivalent to the preparation of an EIR.

The Energy Commission staff has the responsibility to complete an independent assessment of the project's engineering design and identify the potential impacts on the environment, the public's health and safety, and determine whether the project conforms to all applicable laws, ordinances, regulations and standards (LORS). Upon identifying any potentially significant environmental impacts, staff recommends mitigation measures in the form of conditions of certification for construction, operation and eventual closure of the project.

This FSA is not a 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 serves as staff's formal testimony in evidentiary hearings to be held by the Energy Commission Committee assigned to hear this case. The Committee will hold evidentiary hearings and will consider the recommendations presented by the staff, the applicant, intervenors, government agencies, and the public, prior to proposing its decision. The full Energy Commission will make the final decision, including findings, after the Committee's publication of its proposed decision.

PROPOSED PROJECT LOCATION AND DESCRIPTION

The proposed HBEP would be developed by AES Southland Development, LLC, on a 28.6-acre site located at 21730 Newland Street, just north of the intersection of the Pacific Coast Highway (PCH-Highway 1) and Newland Street. The site is privately owned land located in an industrial area of Huntington Beach, California, and is relatively flat with an approximate elevation of 10 to 14 feet above mean sea level. The project borders a manufactured home/recreational vehicle park on the west, a tank farm on the north, the Magnolia Marsh wetlands on the north and east, and the Pacific Ocean and Huntington Beach State Park on the south and southwest. The site is currently occupied by the existing and operational Huntington Beach Generating Station (HBGS), which would be demolished and replaced with the HBEP. The proposed HBEP would be built entirely within the footprint of the HBGS.

The project would consist of two power blocks, each composed of three natural gas combustion turbine generators with supplemental-fired heat recovery steam generators, a steam turbine generator, and air-cooled condenser. Each power block would have the ability to generate power from 110 MW to 470 MW, is designed to start and stop very quickly, and to quickly ramp up and down.

The new HBEP facility would be air-cooled, eliminating the need for large quantities of once-through cooling seawater. The potable water necessary for HBEP's construction, operational process and sanitary purposes would be provided by the city of Huntington Beach, which has provided a will-serve letter indicating there is sufficient supply of potable water to accommodate the HBEP. During operation, storm water and process wastewater would be discharged into a retention basin and then discharged to the ocean via the existing outfall. Discharge flows would substantially decrease compared to existing conditions due to decreased plant water use, and all discharges would meet ocean discharge standards. Sanitary wastewater would be conveyed to the Orange County Sanitation District through an existing sewer connection.

No offsite linear developments are currently proposed as part of this project. The HBEP would connect the nominal 936 MW of electricity through two overhead 230-kV generation ties connecting each power block to the existing onsite Southern California Edison (SCE) Ellis switchyard. Natural gas is delivered to the HBGS via an existing SoCalGas16-inch diameter line to an existing gas metering station. As part of the HBEP project, a new gas metering station and new gas pressure control station would be constructed.

PUBLIC AND AGENCY COORDINATION AND OUTREACH EFFORTS

PUBLIC AND AGENCY NOTICE AND OUTREACH

On August 3, 2012, the Energy Commission staff sent a notice of receipt and a copy of the HBEP AFC to all local, state, and federal agencies that might be affected by the proposed project, and included information on how agencies that administer LORS that are applicable to the proposed project can comment and participate in the proceeding.

Additionally, on June 29, 2012, Energy Commission staff provided notices to property owners within 1,000 feet of the proposed site and within 500 feet of a linear facility (such as transmission lines, gas lines and water lines). These notices informed the public of the Commission's receipt and availability of the AFC, discussed the Energy Commission's siting certification process, provided information on how the public can comment and participate in the proceeding, as well as a brief description of the project, and a link to a Commission-maintained project website (http://www.energy.ca.gov/sitingcases/huntington_beach_energy/index.html).

LIBRARIES

On July 27, 2012, the Energy Commission staff also sent copies of the Huntington Beach Energy Project AFC to the following libraries:

Huntington Beach Public Library
7111 Talbert Avenue
Huntington Beach, CA 92648

Orange County Public Library HQ
1501 E Street Andrew Place
Santa Ana, CA 92705

Costa Mesa/Donald Dungan Library
1855 Park Avenue
Costa Mesa, CA 92627

Costa Mesa/Mesa Verde Library
2969 Mesa Verde Drive
Costa Mesa, CA 92626

Mary Wilson Library
707 Electric Avenue
Seal Beach, CA 90740

Fountain Valley Library
17635 Los Alamos
Fountain Valley, CA 92708

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

ENERGY COMMISSION'S PUBLIC ADVISER'S OFFICE

The Energy Commission's outreach program is also facilitated by the Public Adviser's Office (PAO). The PAO requested public service announcements at a variety of organizations, distributed notices informing the public of the Commission's receipt of the HBEP AFC, and invited the public to attend the Public Site Visit, Environmental Scoping Meeting and Informational Hearing on September 10, 2012, as well as attend the Preliminary Staff Assessment (PSA) workshop on April 3, 2014 in Huntington Beach, California.

PUBLIC WORKSHOPS

Staff from the Energy Commission conducted three public workshops in Huntington Beach, CA to facilitate public, agency, and intervenor participation. These workshops allowed a transparent and comprehensive discussion of technical areas related to the proposed project. A Data Request and Response Workshop was held on November 14, 2012, as well as PSA workshops on November 20, 2013, and April 3, 2014. During the workshops, specific time for public participation was allocated, and public comments were taken. These workshops provided a public forum for the applicant, the intervenor, staff and participating agencies to interact regarding project issues.

CONSULTATION WITH LOCAL NATIVE AMERICAN COMMUNITIES

Energy Commission staff sent written correspondence to the Native American Heritage Commission, as well as to a number of Native American tribes who have expressed an interest in being contacted about development projects in the HBEP area. This correspondence served as an invitation for tribes to consult on the project.

RESPONSE TO COMMENTS

Several public agencies and one public organization filed comments on the project. Comments were received from a number of individuals who did not file for intervenor status on the project, as well as one intervenor (see **Executive Summary - Table 2** below). Staff has addressed the concerns outlined in their letters by responding directly to these comments within the FSA.

Table 2 - HBEP List of Agency/Intervenor Comments

NAME	DATE(S)	REQUEST TO PARTICIPATE	ALTERNATIVES	AIR / PUBLIC HEALTH	BIOLOGY / BOTANY /	CUMULATIVE IMPACTS	GEOLOGICAL/SEISMIC	HAZARDOUS MATERIALS	HOURS OF OPERATION	INTAKE AND OUTFALL PIPELINES	NOISE /CONSTRUCTION	PROJECT DESCIPTION	SOCIECONOMICS	SOIL & WATER	TRAFFIC/LAND USE	VISUAL RESOURCES	PRELIMINARY STAFF
Jason Pyle[1]	9/6/12, 11/16/12	x							x		x						
City of Huntington Beach	12/6/12, 11/12/13			x	x		x	x	x		x	x	x	x	x	x	x
Coastal Commission	8/3/12, 1/23/13				x	x	x		x		x						
Huntington Beach Wetlands Conservancy	12/3/12				x						x					x	
Orange County	12/12/12													x			
Santa Ana Regional Water Quality Control Board	12/10/12													x			
State Lands Commission	9/19/12									x							
USFWS	9/10/12			x	x						x			x			

ENVIRONMENTAL JUSTICE

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." In light of the progress made by federal environmental agencies on environmental justice, the Energy Commission has examined federal guidelines pursuant to its desire to follow environmental justice principles for the environmental review of this project.

[1] Mr. Pyle filed for Intervenor status on 9/6/12 (TN # 67029)

The steps recommended by the U.S. Environmental Protection Agency's (EPA's) guidance documents to assure compliance with Executive Order 12898 regarding environmental justice are:

- outreach and involvement;
- a screening-level analysis to determine the existence of a minority or low-income population; and
- if warranted, a detailed examination of the distribution of impacts on segments of the population.

Though the federal Executive Order and guidance are not binding on the Energy Commission, staff finds these recommendations helpful for implementing this environmental justice analysis.

The purpose of staff's environmental justice screening analysis is to determine whether a low-income and/or minority population exists within the potentially affected area of the proposed site. Staff conducted the screening analysis in accordance with the Final Guidance for Incorporating Environmental Justice Concerns in US EPA's National Environmental Protection Act Compliance Analysis (Guidance Document) dated April 1998. People of color populations, as defined by this Guidance Document, are identified where either:

- the minority population of the affected area is greater than 50 percent of the affected area's general population; or
- the minority population percentage of the area is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographic analysis.

In addition to the demographic screening analysis, staff follows the steps recommended by the U.S. EPA's guidance documents in regard to outreach and involvement; and if warranted, a detailed examination of the distribution of impacts on segments of the population. Staff followed each of the above steps in the development of the FSA, considering potential impacts from HBEP on a potential environmental justice population. Staff determined that neither the construction nor operation of the proposed HBEP project would involve environmental impacts that could contribute to a disproportionate impact on an environmental justice population. Accordingly, no further environmental justice analyses are necessary (see **Socioeconomics Table 2 and 3**).

SUMMARY OF PROJECT-RELATED IMPACTS

Based upon the information provided, discovery achieved, and analyses completed to date, staff concluded that the project complies with all law, ordinances, regulations and standards (LORS), and with the implementation of the recommended mitigation measures described in the conditions of certification, potential environmental impacts of the HBEP project would be mitigated to levels of less than significant.

Summary of HBEP Technical Analyses

TECHNICAL AREA	COMPLIES WITH LOCAL, STATE AND FEDERAL LORS	IMPACTS MITIGATED TO LEVEL BELOW SIGNIFICANT
Air Quality	YES	YES
Alternatives	N/A	N/A
Biological Resources	YES	YES
Cultural Resources	YES	YES
Efficiency	YES	YES
Facility Design	YES	YES
Geology and Paleontology	YES	YES
Hazardous Materials Management	YES	YES
Land Use	YES	YES
Noise and Vibration	YES	YES
Public Health	YES	YES
Reliability	YES	YES
Socioeconomic Resources	YES	YES
Soil & Water Resources	YES	YES
Traffic and Transportation	YES	YES
Transmission Line Safety/Nuisance	YES	YES
Transmission System Engineering	YES	YES
Visual Resources	YES	YES
Waste Management	YES	YES
Water Resources	YES	YES
Worker Safety / Fire Protection	YES	YES

Air Quality – Staff has included Conditions of Certification **AQ-SC1** through **AQ-SC6** to implement control measures for construction impacts. Compliance with these conditions is expected to greatly reduce or eliminate the potential for significant adverse air quality impacts associated with PM10 and PM2.5 during construction of the HBEP. Staff has worked with the applicant to refine the construction modeling impact assessment, and the latest modeling indicates that with additional conditions of certification, PM10 and PM2.5 impacts during the approximately 90 month project construction period still continue to exceed health-based ambient air quality standards. However with implementation of staff's proposed conditions of certifications, these impacts are reduced to less than significant.

Alternatives – In preparation for an alternatives analysis, as the lead agency for CEQA, staff is required to 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 project, including alternatives that would be more costly or would otherwise impede the project's objectives, and evaluate the comparative merits of the alternatives.

Staff reviewed the alternatives analysis provided by the applicant, as well as alternatives recommended through agency and public comment, and developed additional alternatives. Staff's Alternatives analysis included an alternative site configuration, technology alternatives, as well as the no project (retrofit of HBGS) alternative. Staff determined the proposed project has a strong relationship to the existing project site, that there are no preferable alternative sites that could achieve the project objectives, and that the environmentally superior alternative is the proposed HBEP.

Staff received several comments from the public and agencies asking staff to analyze alternative site configurations for potential noise, visual and coastal impacts. Noise was analyzed and staff determined that even if the proposed project were configured differently, similar temporary construction noise impacts would occur within the project boundary, and no significant construction or operational noise impacts to adjacent receptors (including both residential and biological resources) have been identified that could not be mitigated. Visual impacts would not change as the visual prominence of the air cooled condensers, and other equipment, limit options to reconfigure the project site. Staff has reviewed the proposed HBEP layout and determined that reconfiguring the site layout would not significantly lessen or avoid visual impacts, or significantly lessen or avoid noise impacts on coastal resources.

Generation technology alternatives developed and considered by staff focus on technologies that can utilize natural gas, which can take advantage of the existing natural gas pipeline system and also meet the electrical capacity replacement requirements specified by SCAQMD's Rule 1304. Analysis of conventional boiler and steam turbine technology was eliminated from consideration because it did not qualify for the SCAQMD 1304 exemption for offsets. Use of simple-cycle combustion turbines was also eliminated from consideration, as it would not reduce or avoid any HBEP impacts.

The No Project (retrofit) analysis examined two alternatives considered feasible by staff for complying with the SWRCB's once through cooling (OTC) policy: retrofit with air cooled condenser (ACC) or with wet cooling towers. The retrofit ACC would involve retrofitting Units 1 and 2 with ACC, which would result in the generating station operating less efficiently than the proposed HBEP. The wet cooling scenario would require Units 1 and 2 to use a new non-seawater source for cooling water. Staff determined this alternative would result in the generating station operating slightly less efficiently than the proposed HBEP and that neither retrofit alternative would meet the HBEP's objectives of providing efficient, reliable and flexible generation.

Biology – At the publication of the PSA, several issues were unresolved: construction and demolition noise impacts to special-status birds and rehabilitating wildlife, operational noise impacts to rehabilitating wildlife, and nitrogen deposition impacts to sensitive habitats.

To mitigate noise impacts to birds to a less than significant level, staff recommends that average construction and demolition noise must not exceed 60 dBA or 8 dBA above ambient noise levels (whichever is greater) within Upper Magnolia and Magnolia marshes during the nesting season (February 1 to August 31). If construction noise does exceed those levels, staff's proposed Condition of Certification BIO-9 would require additional noise-reducing measures to be implemented and additional noise monitoring conducted to verify the reduction of noise below the thresholds. Construction noise levels are not expected to significantly increase above ambient levels at the Wildlife Care Center, but the applicant has committed to installing temporary noise shielding for the center to reduce construction noise impacts. The operational noise level is also predicted to be below the current ambient level at the Wildlife Care Center so operational noise impacts would be less than significant.

Staff published the results of its nitrogen deposition modeling in the Focused Supplemental Analysis. The applicant submitted comments in response regarding the conservative nature of staff's analysis of impacts from nitrogen deposition. Air quality staff then prepared a technical analysis of the nitrogen deposition modeling for the project and determined that while AERMOD is the best available model, it is conservative and overestimates predicted HBEP nitrogen deposition impacts. Staff provided additional analysis regarding the conservative nature of AERMOD impact analysis, as well as other assumptions which further overestimate impacts of nitrogen deposition. Staff's assessment concluded that the project's modeled nitrogen deposition using AERMOD was 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). As a result, staff determined that the layered conservatisms resulted in an inaccurate conclusion in the PSA that nitrogen deposition may significantly affect native vegetation and habitat.

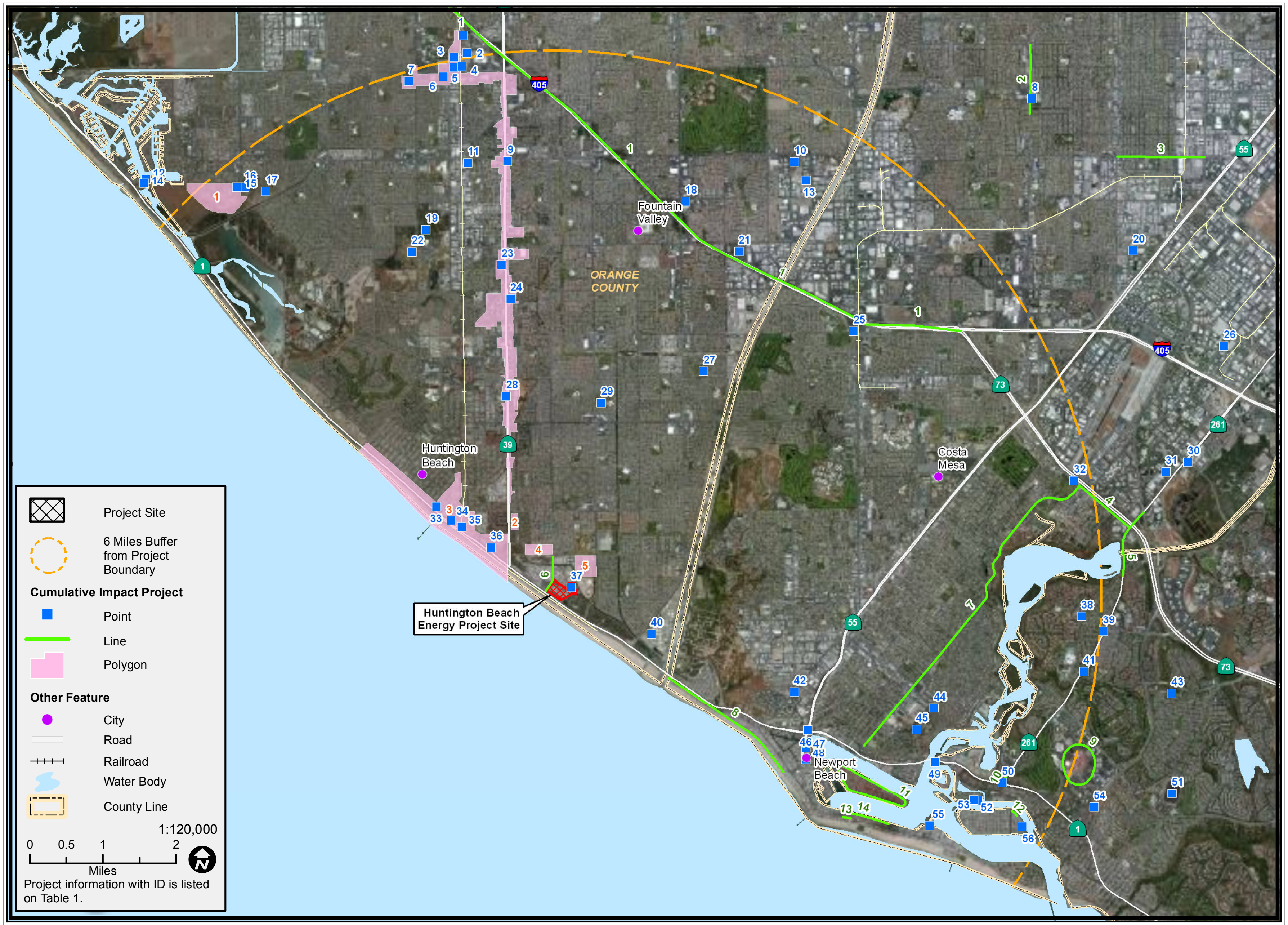
Soil and Water Resources –Staff has determined the project would reduce potable water use relative to baseline conditions. In addition, staff conducted an analysis to evaluate whether secondary effluent from a nearby wastewater treatment plant could be used as a source of recycled water. A number of potential routes as well as ways to reduce costs to deliver secondary effluent to the project site were investigated by staff, but none were found to be economically or technically feasible.

Visual Resources – On April 7, 2014, the Huntington Beach City Council voted to adopt a resolution supporting the applicant's conceptual architectural improvements to screen and enhance views of the HBEP power plant structures. The architectural improvements include three, 125-foot-tall surfboards as focal points for views from the Pacific Coast Highway and Huntington State Beach. Visual screening includes semiopaque, decorative wave forms to partially screen views of the two power blocks. A trompe l'oeil (fool the eye) paint design is proposed for the air cooled condenser units.

Staff concludes that implementation of conditions of certification requiring preparation and implementation of plans to visually screen the project site with architectural enhancements, surface treatments, and other screening measures to soften views of the HBEP would reduce visual impacts to less than significant and ensure the project complies with local and state LORS pertaining to the aesthetics of coastal development.

EXECUTIVE SUMMARY - FIGURE 1

Huntington Beach Energy Project - Cumulative Impacts



CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCE: BLM, ESRI, Tele Atlas, Bing Aerial Image

INTRODUCTION

Testimony of Felicia Miller

PURPOSE OF THIS REPORT

This Final Staff Assessment (FSA) is the California Energy Commission staff's independent analysis of the proposed Huntington Beach Energy Project (HBEP or project). This FSA is a staff document. It is neither a Committee document, nor a draft decision. The FSA describes the following:

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

The analyses contained in this FSA are based upon information from the: 1) Application for Certification (AFC), 2) responses to data requests, 3) supplementary information from local, state, and federal agencies, interested organizations and individuals, 4) existing documents and publications, 5) independent research, and 6) comments at workshops. The FSA presents preliminary conclusions about potential environmental impacts and conformity with LORS, as well as proposed CoCs that apply to the design, construction, operation and closure of the facility. The analyses for most technical areas include discussions of proposed CoCs. The CoCs contain staff's recommended measures to mitigate the project's environmental impacts and to ensure conformance with LORS. Each proposed CoC is followed by a proposed means of "verification" to ensure the CoCs are implemented.

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

ORGANIZATION OF THE FINAL STAFF ASSESSMENT

The FSA contains the Executive Summary, Introduction, Project Description, and Project Alternatives. The next 20 chapters contain the environmental, engineering, public health and safety and alternatives analyses of the proposed project. These chapters 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, including their declarations and resumes.

Each of the 20 technical area assessments includes a discussion of:

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

ENERGY COMMISSION SITING PROCESS

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

The Energy Commission's siting regulations require staff to independently review the AFC, assess whether all of the potential environmental impacts have been properly identified, and whether additional mitigation or other more effective mitigation measures are necessary, feasible, and available (Cal. Code Regs., tit. 20, § 1742 and § 1742.5(a)). In addition, staff must assess the completeness and adequacy of the measures proposed by the applicant to ensure compliance with health and safety standards, and the reliability of power plant operations (Cal. Code Regs., tit. 20, § 1743(b)). Staff is required to develop a compliance plan (coordinated with other agencies) to ensure that applicable laws, ordinances, regulations, and standards are met (Cal. Code Regs., tit. 20, § 1744(b)).

Staff conducts its environmental analysis in accordance with the requirements of CEQA. No additional Environmental Impact Report (EIR) is required because the Energy Commission's site certification program has been certified by the Secretary of the California Natural Resources Agency as meeting all requirements of a certified regulatory program (Pub. Resources Code, § 21080.5 and Cal. Code Regs., tit. 14, § 15251 (j)). The Energy Commission is the CEQA lead agency.

Staff typically prepares a both a Preliminary Staff Assessment (PSA) and FSA. The PSA presents for the applicant, intervenors, organizations, agencies, other interested parties, and members of the public staff's preliminary analysis, conclusions, and recommendations. Staff provided a public comment period that follows the publication of the PSA. The comment period is also used to resolve issues between the parties and to narrow the scope of adjudicated issues in the evidentiary hearings. During this time, staff conducted one or more workshops to discuss its conclusions, proposed mitigation, and proposed verification measures. Based on the workshop dialogue and any written comments received, staff may refine its analysis, correct any errors, and finalize conditions of certification to reflect any changes agreed to between the parties. These revisions and changes will be presented in the FSA which will be published and made available to the public and all interested parties. Staff published a PSA Part A on December 10, 2013, a Focused Staff Analysis (FoSA) on December 20, 2013, and a PSA Part B on March 7, 2014. PSA workshops were held in Huntington Beach on November 20, 2013 and April 3, 2014. The FSA serves as staff's testimony for evidentiary hearings.

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

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

AGENCY COORDINATION

As noted above, the Energy Commission certification is in lieu of any permit required by state, regional, or local agencies and federal agencies to the extent permitted by federal law (Pub. Resources Code, § 25500). However, the Commission staff typically seeks comments from, and works closely with, other regulatory agencies that administer LORS that are applicable to proposed projects. The agencies associated with the HBEP include the U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service, California Coastal Commission, State Water Resources Control Board/Regional Water Quality Control Board, California Department of Fish and Wildlife, Caltrans, California Air Resources Board, California State Parks, the South Coast Air Quality Management District, Orange County Sanitation District, and the City of Huntington Beach.

PROJECT DESCRIPTION

Felicia Miller

INTRODUCTION

On June 27, 2012, AES Southland Development, LLC. submitted an Application for Certification (AFC) to the California Energy Commission (CEC) to construct, own, and operate the Huntington Beach Energy Project (HBEP). The HBEP would replace, and be constructed on 28.6 acres entirely within the footprint of, the existing and operating AES Huntington Beach Generating Station (HBGS) located in an industrial area of Huntington Beach, California at 21730 Newland Street, just north of the intersection of the Pacific Coast Highway (PCH-Highway 1) and Newland Street. The site is relatively flat with an approximate elevation of 10 to 14 feet above mean sea level. The project site borders a manufactured home/recreational vehicle site on the west, a tank farm on the north, the Magnolia Marsh wetlands on the north and east, and the Pacific Ocean and Huntington Beach State Park on the south and southwest.

The HBEP would be a natural gas-fired, combined-cycle, air-cooled, 939-megawatt (MW) electrical generating facility. No new offsite linear facilities are proposed as part of this project. **Project Description Figures 1A, 1B** and **2** show the virtual and existing site appearance for the proposed project. **Project Description Figure 3** is the project site plan map.

HBEP would consist of two independently operating, three-on-one, combined-cycle gas turbine power blocks. Each power block would consist of three Mitsubishi natural gas-fired combustion turbine generators, three supplemental-fired heat recovery steam generators, one steam turbine generator, an air-cooled condenser, and related ancillary equipment. The project will have a generator ramping rate of up to 30 percent per minute, which allows it to rapidly respond to changes in generation and demand. Other equipment and facilities to be constructed and shared by both power blocks include natural gas compressors, water treatment facilities, emergency services, and administration and maintenance buildings.

PROJECT PURPOSE AND OBJECTIVES

The HBEP would provide up to 939 MW of power generation capacity to the western Los Angeles Basin Local Reliability Area and will replace the retiring Huntington Beach Generating Station. The HBGS is scheduled to cease operation by December 31, 2020 in compliance with the California State Water Resources Control's Board's (SWRCB) *Water Quality Control Policy on the Use of Coastal and Estuarine Waters for Power Plant Cooling (policy).* This policy was adopted by the SWRCB on May 4, 2010*,* and regulates the use of seawater for power generation plants utilizing the once-through-cooled (OTC) method.

The proposed HBEP would be an air-cooled, combined-cycle power generating facility designed to start and stop very quickly and be able to ramp up and down, critical in supporting both local electrical reliability and grid stability to support peak demand and meet resource adequacy requirements, as identified by the California Independent System Operator (California ISO).

On June 7, 2013, Southern California Edison (SCE) announced their decision to permanently retire Units 2 and 3 of the San Onofre Nuclear Generating Station (SONGS). The closure of SONGS places additional responsibility on SCE for replacement of over 2200 MW of electrical generation for southern California customers. The HBEP is designed to fill a critical role in replacement generation and reliability for southern California.

The proposed HBEP project objectives are as follows:

1. Provide efficient, reliable and predictable power supply by using combined-cycle, natural gas-fired combustion turbines to replace the OTC generation;

2. Provide replacement generation to replace that of SONGS for southern California customers;

3. Eliminate the use of ocean water for once-through-cooling;

4. Be able to support the local capacity requirements of Southern California's Western Los Angeles Basin;

5. Develop a 939 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;

6. Reuse existing electrical, water, wastewater, and natural gas infrastructures and land to minimize land resource and environmental justice impacts by developing on an existing brown field site;

7. Site the project to serve the load area without constructing new transmission facilities; and

8. Site the project on property that has industrial land use designation with consistent zoning.

PROJECT FEATURES

The main project features would consist of a 28.6-acre power plant site, which will require both onsite and offsite laydown and construction parking. Approximately 22 acres of construction laydown will be required, and a maximum of 300 parking sites. The power plant, transmission lines, Southern California Edison (SCE) switchyard, and natural gas connection are located within the city of Huntington Beach within an area designated as Public, in which the Huntington Beach General Plan permits development of public utilities.

Project Description Figure 1A, shows the general arrangement and layout of the proposed facility. The **VISUAL RESOURCES** section of this PSA includes a number of visual simulations of the proposed project, before and after construction.

The existing HBGS currently has five steam generating units (Units 1, 2, 3, 4, and 5). Units 1 and 2 are currently operational; Units 3 and 4 are owned by Edison Mission Huntington Beach, LLC. Effective October 31, 2012, Units 3 and 4 ceased commercial operation, and the air emission credits transferred to the Walnut Creek Energy Park, a 500 MW generating facility located in City of Industry, California. On September 7, 2012 the California ISO approved a must-run contract on Units 3 and 4 to convert to synchronous condensers to provide voltage support to southern Orange County and San Diego in response to the the San Onofre Nuclear Generating Station units 2 and 3 being unavailable for the summer of 2013. A major amendment was approved by the Energy Commission on December 7, 2012, to convert Units 3 and 4 to synchronous condensers which will provide voltage support. Unit 5, a 133 MW peak demand facility, was retired in 2002.

The existing HBGS has various ancillary facilities that will remain in use to support HBEP. These facilities include the administration/warehouse building, SoCalGas natural gas pipeline interconnection and metering station, City of Huntington Beach potable water connection and sanitary sewer system.

Natural gas is delivered via an existing SoCalGas16-inch diameter line to an existing gas metering station. As part of the HBEP project, a new gas metering station and new gas pressure control station will be constructed by the project owner.

The project will use potable water for construction and operational processes and sanitary uses. The water delivered to the HBEP site is supplied from an existing 8-inch pipeline from the City of Huntington Beach into a 442,500 gallon service water/fire water storage tank. This water will be used as plant service water, irrigation water, makeup water to the combustion turbine inlet air evaporative coolers, and raw feed to the steam cycle makeup water treatment system. The City of Huntington Beach has provided a will-serve letter indicating there is sufficient supply of potable water to accommodate the HBEP. Alternative water sources, including potential use of reclaimed water, to support the HBEP were analyzed and determined to be infeasible.

Makeup water for the HBEP power blocks steam cycle will have contaminants removed by passing the service water through a reverse osmosis system followed by a continuous electrode ionization process.

Sanitary wastewater generated by the HBEP will be discharged to the City of Huntington Beach existing 4-inch sewer main that services the existing HBGS. HBEP process wastewater and site storm water will be collected in an onsite retention basin then discharged to the Pacific Ocean via an existing outfall which services the existing HBGS.

The 442,500 gallon service water/fire water storage tank will provide approximately 35 hours of operational storage and 2 hours of fire protection storage in the event of a disruption in water supply. The existing fire water distribution system, including two emergency diesel-fired fire water pumps, storage tanks and piping, will remain in service as part of the fire protection system, but will be modified to meet all LORS for the HBEP and to accommodate the newly constructed facilities.

The construction laydown areas consist of 6 acres at the HBGS site and 16 acres at the AES Alamitos Generating Station (AGS) in Long Beach. The AGS laydown site in Long Beach will also be used for laydown for the Alamitos Energy Center (13-AFC-01), and has zoning and land use designations consistent for that use. The AGS site will be used for temporary short-term component storage only; no assembly of components will take place at the Long Beach site. During construction, the large components will be hauled directly from the Port of Long Beach or the construction laydown area at the AGS site to the HBEP site, as they would be ready for installation. Construction and demolition parking will be provided by a combination of onsite and offsite parking totaling 1,040 spaces. A maximum of 300 parking spaces will be required during construction and demolition activities. Approximately 130 parking spaces (1.5 acres) will be provided onsite, 300 parking spaces (3 acres) across Newland Street adjacent to HBEP, 215 parking spaces (2.5 acres) at the corner of PCH and Beach Boulevard, 225 parking spaces at the City of Huntington Beach shore parking, and 170 parking spaces (1.9 acres) at the Plains All American Tank Farm on Magnolia Street. During peak construction and demolition activities, a maximum of 331 parking spaces would need to be available. Although only 331 parking spaces will be necessary during construction and demolition activities, the applicant has provided additional parking spaces, as some parking spaces along Huntington Beach will not be available during peak summer months.

Two 230-kilovolt (kV) transmission interconnections will connect HBEP power blocks 1 and 2 to the existing onsite SCE Ellis switchyard.

PROJECT DEMOLITION AND CONSTRUCTION SCHEDULE

Demolition and construction of the HBEP will commence in phases to allow continued operation of existing power generation and voltage units to maintain a minimum generating capacity of at least 430 MW of power delivery and grid reliability. Construction of HBEP Power Blocks 1 and 2 will be coordinated with the operation and demolition of the existing HBGS Units 1, 2, 3, 4, and 5 and are contingent on permitting and CPUC-approved power purchase agreements. HBEP construction will require the removal of the existing HBGS Units 3, 4, and 5 and existing fuel storage tanks. Initial demolition begins with Unit 5, the fuel storage tanks and the stack for Unit 3 and 4 to provide the space for Power Block 1. Once Power Block 1 is operational, the synchronous condenser will cease operation and the remainder of units 3 and 4 will be demolished. The demolition of Units 3 and 4 are not part of this certification process, as Units 3 and 4 were licensed through the CEC (00-AFC-13C) and demolition is authorized under that license. Power Block 2 will be constructed on the footprint of the demolished Units 3 and 4. Once Power Block 2 is operational, the remaining HBGS Units 1 and 2 will be demolished. The construction of the control and maintenance buildings (buildings 33 and 34) is scheduled to occur during the last 14 months of the demolition of Units 1 and 2. Power Block 1 is scheduled for commercial operation in the fourth quarter of 2018, or first quarter of 2019; Power Block 2 is scheduled for commercial operation in the second or third quarter of 2020.The demolition of existing generating units and synchronous condensers and construction of new power blocks would occur in phases scheduled to take place over approximately a 90-month period to allow for continued operation to maintain generating capacity and provide critical voltage support at all times. See Project Description Table 1 for proposed construction and demolition schedule.

Project Description - Table 1

DEMOLITION / CONSTRUCTION ACTIVITY	TIMELINE
Demolish Unit 5, fuel tanks and Units 3 & 4 stack	Q1 2015 – Q2 2016 15 months
Construction Power Block 1	Q3 2016 – Q4 2018 30 months
Commercial Operation Power Block 1	Q4 2018 or Q1 2019
Demolish Units 3, 4	Q1 2016 – Q1 2018 27 months
Construction Power Block 2	Q3 2018 – Q2 2020 28 months
Commercial Operation Power Block 2	Q2 or Q3 2020
Demolish Units 1, 2	Q4 2020 – Q3 2022 24 months
Construction of buildings 33, 34	Q3 2021 – Q3 2022 14 months

RESPONSE TO AGENCY AND PUBLIC COMMENTS

In response to a comment made at the Scheduling Conference on April 8, 2014 regarding the possibility of more-advanced or different technology being available once the project has completed construction after a lengthy construction period; pursuant to Title 20, California Code of Regulations. § 1769, the applicant must contact the Compliance Project Manager to modify the design, operation, or performance requirements of the project/and or linear facilities of the project. Once the amendment is reviewed and approved, the applicant may proceed with the project modification.

NOTEWORTHY PUBLIC BENEFITS

The California ISO has recognized the importance of the existing HBGS location in providing energy and contingency reserve for the Western Los Angeles Basin Local Reliability Area and northern San Diego County. Specifically, this location serves Orange County by providing essential electrical service to the existing SCE Ellis substation through a dedicated 230-kilovolt (kV) transmission line connection. If approved by the Energy Commission, the HBEP will ensure the long-term viability of this existing critical generating location and will provide essential electrical service to the residents of Orange County and Huntington Beach. HBEP’s quick-start peaking electric generation capacity will meet peak demand and resource adequacy requirements as identified by AB 380 (Resource Adequacy) and the California ISO.

The proposed HBEP will be air cooled, eliminate the use of OTC and the use of seawater currently being used at the HBGS, which is scheduled to retire by December 31, 2020. This will eliminate the use of ocean water at the power plant site and will eliminate the potential impacts to marine life through impingement and entrainment in an OTC system. In addition, the proposed HBEP will result in a substantial reduction in fresh water usage, using 20% of the fresh water used by the existing HBGS.

The HBEP will be located entirely within the footprint of the existing HBGS site, which will result in avoiding the need to construct new linear facilities, including gas and water supply lines, discharge lines and transmission interconnections. Siting the HBEP on the HBGS site is consistent with existing zoning regulations, and will result in reducing potential offsite environmental impacts, the cost of construction, and ensures no new site is converted to industrial use.

The design of the proposed HBEP is a smaller footprint and lower profile than the existing HBGS, which will be an improvement to the aesthetic quality of the project. Removal of an assemblage of structures, tanks, and cooling tower and replacement with project elements that are shorter and set back further to the north of the PCH will reduce some of the existing visual conditions. On April 7, 2014, the City of Huntington Beach approved a visual enhancement plan for the HBEP, which will further reduce visual conditions. HBEP will utilize an existing power generation site with a General Plan Land Use designation of Public and a zoning designation of Public-Semipublic, which provides for power generation on the site, resulting in consistent zoning, and electrical, water, wastewater, and natural gas infrastructure in place. Retiring the once-through cooling system would minimize potential offsite environmental impacts, and the project would eliminate the need for a new site to be converted to Public-Semipublic use. In addition, the HBEP will replace an older, dirtier and less efficient power generation plant with a cleaner, more efficient power generation plant.

PROJECT DESCRIPTION - FIGURE 1A

Huntington Beach Energy Project - Conceptual Drawing

PROJECT DESCRIPTION - FIGURE 1B

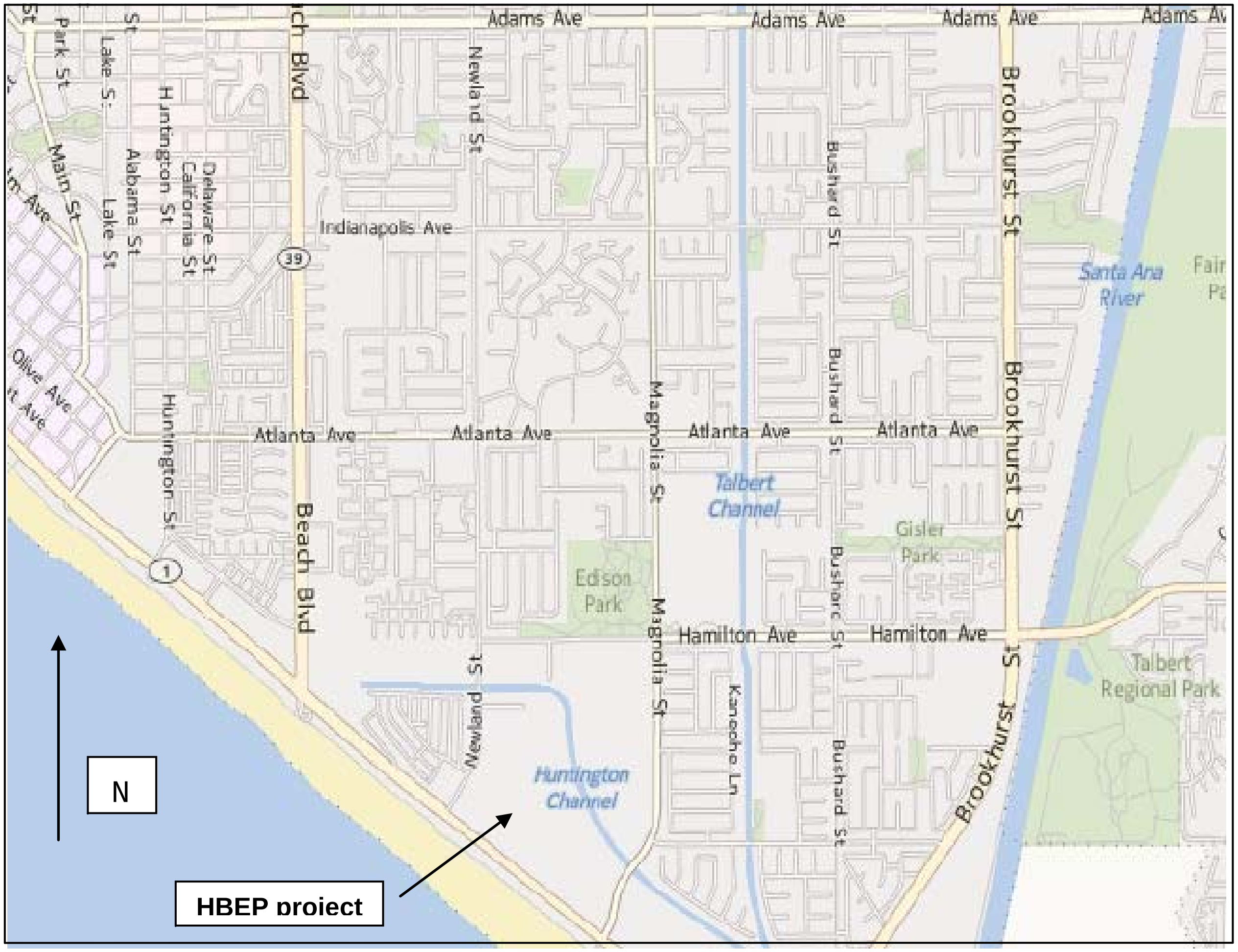
Huntington Beach Energy Project - Conceptual Drawing

PROJECT DESCRIPTION - FIGURE 2

Huntington Beach Energy Project - Current View

PROJECT DESCRIPTION - FIGURE 3

Huntington Beach Energy Project - Site Plan Map



Environmental Assessment

AIR QUALITY

Testimony of Tao Jiang, Ph.D., P.E.

SUMMARY OF CONCLUSIONS

Staff concludes that with the adoption of the attached conditions of certification, the proposed Huntington Beach Energy Project (HBEP) would not result in significant air quality related impacts during project operation, and that the HBEP would comply with all applicable federal, state and South Coast Air Quality Management District (SCAQMD or District) air quality laws, ordinances, regulations, and standards (LORS). At the time of this analysis, SCAQMD's Final Determination of Compliance (FDOC) is not available. Therefore the analyses and conditions of certification are based on the revised Preliminary Determination of Compliance (PDOC), dated April 11, 2014. The revised PDOC was published by the SCAQMD after taking into consideration staff's and the applicant's comment letters.

Staff concludes that operating period mitigation would be provided in the form of Regional Clean Air Incentives Market (RECLAIM) Trading Credits (RTCs) and emission reduction credits (ERCs) as required by district rules and that these measures would fully mitigate emissions of all nonattainment pollutants and their precursors at a minimum ratio of one-to-one. These mitigation measures reduce potential operational impacts of the proposed project to less than significant.

Staff includes Conditions of Certification **AQ-SC1** through **AQ-SC5** to implement control measures to mitigate construction impacts. Compliance with these conditions is expected to greatly reduce or eliminate the potential for significant adverse air quality impacts during construction of the HBEP except for PM10 and PM2.5. Staff has worked with the applicant to refine the construction modeling impact assessment. However, the latest modeling still shows that PM10 and PM2.5 impacts during the approximately 7.5-year project construction period would cause exceedances of health-based ambient air quality standards and thus these impacts would be significant. The duration and complexity of construction that contributes to these potential impacts are due in part to the desire of the project owner and the California Independent System Operator to have continuity of generation and/or reactive power from the site. There would be concurrent operation, demolition, commissioning and construction activities throughout the construction period. Therefore, as proposed by the applicant, staff includes a local street sweeping program in Condition of Certification **AQ-SC6** to further mitigate the PM impacts during the construction period to less than significant.

Global climate change and greenhouse gas emissions from the project are discussed and analyzed in **AIR QUALITY APPENDIX AIR-1**. The HBEP would emit approximately 0.479 metric tonnes of carbon dioxide per megawatt hour ($MTCO_2$/MWh), which complies with Greenhouse Gases Emission Performance Standard of 0.5 metric tonnes CO_2 /MWh (Title 20, California Code of Regulations, section 2900 et seq.). Mandatory reporting of the GHG emissions would occur and the Air Resources Board is updating greenhouse gas regulations and a cap–and–trade program for greenhouse gas emissions. The project is expected to be subject to these requirements as the regulations are more fully developed and implemented.

INTRODUCTION

This analysis evaluates the expected air quality impacts of the emissions of criteria air pollutants from both the construction and operation of the proposed HBEP project. The project would be located entirely within the footprint of the existing Huntington Beach Generating Station, an operating power plant. The HBEP is a proposed natural-gas fired, combined-cycle, air-cooled, 939-megawatt (MW) electrical generating facility that would replace the existing Huntington Beach Generating Station.

Criteria air pollutants are defined as air contaminants for which the state and/or federal government has established an ambient air quality standard to protect public health. The criteria pollutants analyzed are nitrogen dioxide (NO_2), sulfur dioxide (SO_2), carbon monoxide (CO), ozone (O_3), inhalable particulate matter (PM10), and fine particulate matter (PM2.5). In addition, nitrogen oxides (NOx, consisting primarily of nitric oxide [NO] and NO_2), sulfur oxides (SOx) and volatile organic compounds (VOC) are also analyzed. NOx and VOC readily react in the atmosphere as precursors to ozone. NOx and SOx emissions also readily react in the atmosphere to form particulate matter, and are major contributors to acid rain. Global climate change and greenhouse gas (GHG) emissions from the project are discussed and analyzed in the context of cumulative impacts (**AIR QUALITY APPENDIX AIR-1**).

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

- Whether the HBEP is likely to conform with applicable federal, state, and SCAQMD air quality laws, ordinances, regulations and standards (Title 20, California Code of Regulations, section 1744 (b));
- Whether the HBEP is likely to cause significant air quality impacts, including new violations of ambient air quality standards, or make substantial contributions to existing violations of those standards (Title 20, California Code of Regulations, section 1743); and
- Whether the mitigation measures proposed for the project are adequate to lessen the potential impacts to a level of insignificance (Title 20, California Code of Regulations, section 1742 (b)).

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

The following federal, state, and local laws, ordinances, regulations, and standards (LORS) and policies pertain to the control of criteria pollutant emissions and the mitigation of air quality impacts. Staff's analysis describes or evaluates the project's compliance with these requirements, as in **Air Quality Table 1**.

Air Quality Table 1
Laws, Ordinances, Regulations, and Standards (LORS)

Applicable LORS	Description
Federal	**U.S. Environmental Protection Agency**
Title 40 CFR Part 51 (New Source Review)	Requires new source review (NSR) facility permitting for construction or modification of specified stationary sources. NSR applies to sources of designated nonattainment pollutants. This requirement is addressed through SCAQMD Regulation XIII.
Title 40 CFR Part 52 (Prevention of Significant Deterioration Program)	Requires prevention of significant deterioration (PSD) review and facility permitting for construction of new or modified major stationary sources of pollutants that occur at ambient concentrations that attain the NAAQS. A PSD permit would be required for NO_2, SO_2, CO and PM10. HBEP would also be a new major stationary source of GHG (exceeding 100,000 tons per year) which requires a PSD permit for GHGs. The PSD program was initially within the jurisdiction of the U.S. EPA. On January 9, 2013, SCAQMD became the agency responsible for the issuance of GHG PSD permits for sources within the District.
Title 40 CFR Part 60, Subpart Da	New Source Performance Standard (NSPS) for Steam Generators: for the fired HRSGs greater than the 250 mmbtu/hr, the emission standards are NOx 0.2 lbs/mmbtu, PM 0.015 lbs/mmbtu, and SO_2 0.2 lbs/mmbtu.
Title 40 CFR Part 60, Subpart KKKK	New Source Performance Standard (NSPS) for Stationary Combustion Turbines: 15 parts per million (ppm) NOx at 15% O2 and fuel sulfur limit of 0.060 lb SOx per million Btu heat input.
Title 40 CFR Part 64	Compliance Assurance Monitoring for emission units at major stationary sources required to obtain a Title V permit. The turbines will be subject to emission limits of NOx, CO, VOC, and PM10 if the emissions are greater than the major source thresholds. Control systems are used for NOx, CO, and VOC, but not PM10.
Title 40 CFR Part 72	Acid Rain Program. Requires reductions in NOx and SO_2 emissions, implemented through the Title V program. Permitting and enforcement are delegated to SCAQMD.
State	**California Air Resources Board and Energy Commission**
California Health & Safety Code (H&SC) §41700 (Nuisance Regulation)	Prohibits discharge of such quantities of air contaminants that cause injury, detriment, nuisance, or annoyance.
H&SC §40910-40930	Permitting of source needs to be consistent with approved clean air plan.
California Public Resources Code §25523(a); 20 CCR §1752, 2300-2309 (CEC & CARB Memorandum of Understanding)	Requires that Energy Commission decision on AFC include requirements to assure protection of environmental quality.
HSC Sections 21080, 39619.8, 40440.14 (AB1318)	Requires the executive officer of the SCAQMD, upon making a specified finding, to transfer emission reduction credits for certain pollutants from the SCAQMD's internal emission credit accounts to eligible electrical generating facilities.
Local	**South Coast Air Quality Management District**
Regulation II – Permits	This regulation sets forth the regulatory framework of the application for issuance of construction and operation permits for new, altered and existing equipment.
Regulation IV – Prohibitions	This regulation sets forth the restrictions for visible emissions, odor nuisance, fugitive dust, various air emissions, and fuel contaminants. This regulation also specifies additional performance standards for stationary gas turbines and other internal combustion engines.

Applicable LORS	Description
Regulation XIII: New Source Review	Establishes the pre-construction review requirements for new, modified or relocated facilities to ensure that these facilities do not interfere with progress in attainment of the national ambient air quality standards and that future economic growth in the SCAQMD is not unnecessarily restricted. However, this regulation does not apply to NOx or SOx emissions from certain sources, which are addressed by Regulation XX (RECLAIM).
Regulation XVII: Prevention of Significant Deterioration	This regulation sets forth the preconstruction requirement for stationary sources to ensure that the air quality in clean air areas does not significantly deteriorate while maintaining a margin for future industrial growth.
Regulation XX: Regional Clean Air Incentives Market (RECLAIM)	RECLAIM is designed to allow facilities flexibility in achieving emission reduction requirements for NOx and SOx through controls, equipment modifications, reformulated products, operational changes, shutdowns, other reasonable mitigation measures or the purchase of excess emission reductions.
Regulation XXX: Title V Permits	The Title V federal program is the air pollution control permit system required by the federal Clean Air Act as amended in 1990. Regulation XXX defines the permit application and issuance as well as compliance requirements associated with the program. Any new or modified major source which qualifies as a Title V facility must obtain a Title V permit prior to construction, operation or modification of that source. Regulation XXX also integrates the Title V permit with the RECLAIM program such that a project cannot proceed without both.
Regulation XXXI Acid Rain Permits	Title IV of the federal Clean Air Act provides for the issuance of acid rain permits for qualifying facilities. Regulation XXXI integrates the Title V program with the RECLAIM program. Regulation XXXI requires a subject facility to obtain emission allowances for SOx emissions as well as monitoring SOx, NOx, and carbon dioxide (CO2) emissions from the facility.

SETTING

METEOROLOGICAL CONDITIONS

The climate of the South Coast Air Basin (basin) is strongly influenced by local terrain and geography. The basin is a coastal plain with connecting broad valleys and low hills, bounded by the Pacific Ocean on the west, and relatively high mountains forming the north, south, and east perimeters. The climate is mild, tempered by cool sea breezes and is dominated by the semi-permanent high pressure of the eastern Pacific.

Across the 6,600-square-mile basin, there is little variation in the annual average temperature of 62°F. However, the eastern portion of the basin (generally described as the Inland Empire area), experiences greater variability in annual minimum and maximum temperatures as this area is farther from the coast and the moderating effect on climate from the ocean is weaker. All portions of the basin have recorded temperatures well above 100°F. January is usually the coldest month, while the months of July and August are usually the hottest. The majority of the rainfall in the basin falls during the period from November through April. Annual rainfall values range from approximately 9 inches per year in Riverside, to 14 inches per year in downtown Los Angeles. Monthly and annual rainfall totals can vary considerably from year to year. Cloud cover, in the form of fog or low stratus, is often caused by persistent low inversions and the cool coastal ocean water. Downtown Los Angeles experiences sunshine approximately 73 percent of the time during daylight hours, while the inland areas experience a slightly higher amount of sunshine, and the coastal areas a slightly lower value (WRCC 2013).

Wind and sunlight affect dispersion of onsite air pollutant emissions and the transport of air pollution to and from the site. Wind roses and wind frequency distribution data collected at John Wayne Airport station were provided by the applicant (HBEP 2013kk). The most predominant annual wind direction at this monitoring site is from the southwest. There are also less frequent southeast winds occurring all year around. The annual calm wind is about 22 percent and the annual average speed is 1.67 meters/second (m/s).

Along with the wind flow, atmospheric stability and mixing heights are important factors in the determination of pollutant dispersion. Atmospheric stability reflects the amount of atmospheric turbulence and mixing. In general, the less stable an atmosphere, the greater the turbulence, which results in more mixing and better dispersion. The mixing height, measured from the ground upward, is the height of the atmospheric layer in which convection and mechanical turbulence promote mixing. Good ventilation results from a high mixing height and at least moderate wind speeds within the mixing layer. In general, mixing is more limited at night and in the winter in the basin when there is a higher potential for lower level inversion layers being present along with low speed surface winds.

AMBIENT AIR QUALITY STANDARDS

The United States Environmental Protection Agency (U.S. EPA) and the California Air Resource Board (ARB) have both established allowable maximum ambient concentrations of criteria air pollutants. These are based upon public health impacts and are called ambient air quality standards. The California Ambient Air Quality Standards (CAAQS), established by ARB, are typically lower (more stringent) than the federally established National Ambient Air Quality Standards (NAAQS).

Ambient air quality standards are designed to protect people who are most susceptible to respiratory distress such as asthmatics, the elderly, very young children, people already weakened by other disease or illness, and people engaged in strenuous work or exercise. The ambient air quality standards are also set to protect public welfare, including protection against decreased visibility and damage to animals, crops, vegetation, and buildings.

Current state and federal ambient air quality standards are listed in **Air Quality Table 2**. The averaging time for the various ambient air quality standards (the duration over which all measurements taken are averaged) ranges from one hour to one year. The standards are read as a concentration, in parts per million (ppm), parts per billion (ppb), or as a weighted mass of material per unit volume of air, in milligrams (mg or 10^{-3} g) or micrograms (µg or 10^{-6} g) of pollutant in a cubic meter (m^3) of ambient air, drawn over the applicable averaging period.

EXISTING AMBIENT AIR QUALITY

The U.S. Environmental Protection Agency (U.S. EPA), California Air Resource Board (ARB), and the local air district classify an area as attainment, unclassified, or nonattainment, depending on whether or not the monitored ambient air quality data show compliance, insufficient data is available, or non-compliance with the ambient air quality standards, respectively. The HBEP project site is located within the South Coast Air Basin and within the SCAQMD. The federal and state attainment status of criteria pollutants in the SCAQMD are summarized in **Air Quality Table 3**.

Meteorological data from the John Wayne Airport station was used for air quality modeling to determine the project impacts. Although the operating monitoring station closest to the proposed site is North Coastal Orange County station (also called the Costa Mesa station), the data from the John Wayne Airport station is more appropriate because of the following factors: 1) surface characteristics at John Wayne Airport are more similar to the project site, 2) John Wayne Airport data are more current, 3) John Wayne Airport has fewer missing data points and 4) the Costa Mesa data provide inconsistent results because the calm winds percentage varies from 0 percent to 38 percent depending on data processing methods. Background concentrations of O_3, NO_2, SO_2, and CO were determined using North Coastal Orange County monitoring station data, located about 3.5 miles northeast from the project site. Ambient concentrations of PM10 and PM2.5 are collected from Long Beach station, approximately 17 miles to the northwest of the project site.

Air Quality Table 2
Federal and State Ambient Air Quality Standards

Pollutant	Averaging Time	Federal Standard	California Standard
Ozone (O3)	8 Hour	0.075 ppm (147 µg/m^3)[a]	0.070 ppm (137 µg/m^3)
	1 Hour	—	0.09 ppm (180 µg/m^3)
Carbon Monoxide (CO)	8 Hour	9 ppm (10 mg/m^3)	9 ppm (10 mg/m^3)
	1 Hour	35 ppm (40 mg/m^3)	20 ppm (23 mg/m^3)
Nitrogen Dioxide (NO2)	Annual	53 ppb (100 µg/m^3)	0.030 ppm (57 µg/m^3)
	1 Hour	100 ppb (188 µg/m^3)[b]	0.18 ppm (339 µg/m^3)
Sulfur Dioxide (SO2)	24 Hour	—	0.04 ppm (105 µg/m^3)
	3 Hour	0.5 ppm (1300 µg/m^3)	—
	1 Hour	75 ppb (196 µg/m^3)[c]	0.25 ppm (655 µg/m^3)
Respirable Particulate Matter (PM10)	Annual	—	20 µg/m^3
	24 Hour	150 µg/m^3	50 µg/m^3
Fine Particulate Matter (PM2.5)	Annual	12 µg/m^3	12 µg/m^3
	24 Hour	35 µg/m^3 [b]	—
Sulfates (SO4)	24 Hour	—	25 µg/m^3
Lead	30 Day Average	—	1.5 µg/m^3
	Rolling 3-Month Average	1.5 µg/m^3	—
Hydrogen Sulfide (H_2S)	1 Hour	—	0.03 ppm (42 µg/m^3)
Vinyl Chloride (chloroethene)	24 Hour	—	0.01 ppm (26 µg/m^3)
Visibility Reducing Particulates	8 Hour	—	In sufficient amount to produce an extinction coefficient of 0.23 per kilometer due to particles when the relative humidity is less than 70%.

Source: ARB 2013a, EPA 2013a

Note: [a] Fourth- highest maximum 8 – hour concentration, averaged over 3 years.

[b] 98th percentile of daily maximum value, averaged over 3 years

[c] 99th percentile of daily maximum value, averaged over 3 years

AIR QUALITY Table 3
Attainment Status of South Coast Air Quality Management District (SCAQMD)

Pollutants	Attainment Status	
	Federal Classification	**State Classification**
Ozone (1-hr)	No Federal Standard	**Nonattainment**
Ozone (8-hr)	**Nonattainment**	**Nonattainment**
CO	Attainment	Attainment
NO_2	Unclassified/Attainment	**Nonattainment**
SO_2	Attainment	Attainment
PM10	Attainment	**Nonattainment**
PM2.5	**Nonattainment**	**Nonattainment**
Lead	Attainment	Attainment

Source: ARB 2013b, EPA 2013b.

Nonattainment Criteria Pollutants

Air Quality Table 4 summarizes the existing ambient monitoring data for nonattainment criteria pollutants (nitrogen dioxide, ozone and particulate matter) collected from 2007 to 2012 by ARB and SCAQMD from monitoring stations near the project site. Data in this table that are marked in bold and shaded indicate that the most-stringent current standard was exceeded during that period. Note that an exceedance is not necessarily a violation of the standard, and that only persistent exceedances lead to designation of an area as nonattainment.

Nitrogen Dioxide (NO_2)

Nitrogen oxides (NOx) include nitric oxide (NO) and nitrogen dioxide (NO_2). Approximately 75 to 90 percent of the NOx emitted from combustion sources is NO. NO is oxidized in the atmosphere to NO_2 by oxygen and ozone. High ambient concentrations of NO_2 usually occur during the fall when atmospheric conditions tend to trap ground-level emissions but lack significant photochemical activity due to less sunlight. In the summer, the conversion rates of NO to NO_2 are high, but the relatively high temperatures and windy conditions (atmospheric unstable conditions) generally disperse pollutants and also engage NO in reactions with VOCs to form ozone. The formation of NO_2 in the presence of ozone is according to the following reaction:

$$NO + O_3 \rightarrow NO_2 + O_2$$

Urban areas typically have high daytime ozone concentrations that drop substantially at night as the above reaction takes place, and ozone scavenges the available NO. If ozone is unavailable to oxidize the NO, less NO_2 will form because the reaction is “ozone-limited.” This reaction explains why, in urban areas, ground-level ozone concentrations drop at night, while aloft and in downwind rural areas (without sources of fresh NO emissions), nighttime ozone concentrations can remain relatively high.

Air Quality Table 4
Nonattainment Criteria Pollutants Concentrations, 2007-2012 (ppm or μg/m^3)

Pollutant	Averaging Time	2007	2008	2009	2010	2011	2012
NO_2 (ppm)	1 hour	0.07	0.08	0.07	0.07	0.06	0.074
NO_2 (ppm)	Federal 1 hour	0.06	-	0.057	0.056	0.053	0.05
NO_2 (ppm)	Annual	0.013	0.013	0.013	0.011	0.01	0.01
Ozone (ppm)	1 hour	0.082	**0.094**	0.087	**0.097**	**0.093**	**0.090**
Ozone (ppm)	8 hour	**0.072**	**0.079**	**0.075**	**0.076**	**0.077**	**0.076**
PM10 (μg/m^3)	24 hour	**75**	**62**	**62**	44	43	45
PM10 (μg/m^3)	Annual	**30.2**	**29.1**	**30.5**	**22**	**24.2**	**23.3**
PM2.5[a] (μg/m^3)	24 hour	**40.8**	**38.9**	34.2	28.3	27.8	26.4
PM2.5 (μg/m^3)	Annual	**14.6**	**14.2**	**13**	10.5	11.0	10.4

Source: SCAQMD 2013d, ARB 2013c, EPA 2013c.
Note: [a] The 24-hour PM 2.5 concentrations are the 98th percentile highest daily 24-hour average PM2.5 concentrations during that year.

The U.S. EPA implemented a new 1-hour NO_2 standard of 0.1 ppm, which became effective on April 12, 2010. The new standard is expressed as a 3-year average of the 98th percentile of the *daily maximum* 1-hour concentration (i.e., the 8th highest of daily highest 1-hour concentrations). **Air Quality Table 4** shows the maximum 1-hour NO_2 concentrations at the Costa Mesa station. Data from 2007 to 2012 show that NO_2 concentrations measured at this station have never exceeded either the federal or state standards. The SCAQMD is currently designated as unclassified for federal NO_2 standard but nonattainment for the state NO_2 standard.

Ozone

Ozone is not directly emitted from stationary or mobile sources. It is a secondary pollutant formed through complex chemical reactions between nitrogen oxides (NOx) and volatile organic compounds (VOC). Ozone formation is highest in the summer and fall when abundant sunshine and high temperatures trigger the necessary photochemical reactions, and lowest in the winter. The days with the highest ozone concentrations in this region commonly occur between May and October. The SCAQMD is classified as a nonattainment area with respect to both state and national ambient air quality standards for ozone.

Respirable Particulate Matter (PM10)

PM10 is a mixture of small solid particles and liquid droplets with a size less than or equal to 10 microns diameter. PM10 can be emitted directly or it can be formed many miles downwind from emission sources when various precursor pollutants interact in the atmosphere. Gaseous emissions of pollutants like NOx, SOx and VOC from turbines, and ammonia from NOx control equipment, given the right meteorological conditions, can form particulate matter in the form of nitrates (NO_3), sulfates (SO_4), and organic particles. These pollutants are known as secondary particulates, because they are not directly emitted but are formed through complex chemical reactions in the atmosphere.

PM nitrate (mainly ammonium nitrate) is formed in the atmosphere from the reaction of nitric acid and ammonia. Nitric acid in turn originates from NOx emissions from combustion sources. The nitrate ion concentrations during the wintertime are a significant portion of the total PM10, and an even higher contributor to particulate matter of less than 2.5 microns (PM2.5), described more fully below. The nitrate ion is only a portion of the PM nitrate, which can be in the form of ammonium nitrate (ammonium plus nitrate ions) or sodium nitrate.

As shown in **Air Quality Table 4**, the federal 24-hour PM10 standard of 150 μg/m^3 has never been exceeded at the stations near the project site from 2007 through 2012. However, the CAAQS 24-hour standard of 50 μg/m^3 has been exceeded during 2007-2009 period. The maximum 24-hour concentration recorded during the analysis period was 75 μg/m^3 in 2007. The maximum annual concentration was 30.5 μg/m^3 in 2009. The SCAQMD is characterized as attainment for federal PM10 standard but nonattainment for state PM10 standard.

Fine Particulate Matter (PM2.5)

PM2.5 refers to particles and droplets with a diameter less than or equal to 2.5 microns. PM 2.5 is believed to pose a greater health risk than PM10 because it can lodge deeply into the lungs due to the small size. PM2.5 includes nitrates, sulfates, organic carbon and elemental carbon, which mainly result from combustion and atmospheric reactions. Almost all combustion-related particles, including those from wood smoke and cooking, are smaller than 2.5 microns. Nitrate and sulfate particles are formed through complex chemical reactions in the atmosphere. Particulate nitrate (mainly ammonium nitrate) is formed in the atmosphere from the reaction of nitric acid and ammonia. Nitric acid in turn originates from NOx emissions from combustion sources. The nitrate ion concentrations during the winter make up a large portion of the total PM2.5.

Air Quality Table 4 summarizes the ambient PM2.5 data collected from the Long Beach station. The national 24-hour average NAAQS is met if the 3-year average of the 98^{th} percentile concentration is 35 μg/m^3 or lower. This threshold was exceeded in 2007 and 2008 with the maximum values of 40.8 and 38.9 μg/m^3. The annual arithmetic means during the 2007-2012 period are below the federal standard of 15 μg/m^3, but exceed the state standard of 12 μg/m^3 in several years. For purpose of state and federal air quality planning and permitting, the SCAQMD is nonattainment with both federal and state PM2.5 standard.

Attainment Criteria Pollutants

Carbon Monoxide

Carbon monoxide (CO) is a product of incomplete combustion due to the insufficiency of oxygen content at the point of combustion. Mobile sources are the main sources of CO emissions. Ambient concentrations of CO are highly dependent on motor vehicle activity. CO is a local pollutant, with high concentrations usually found near the emission sources. The highest CO concentrations occur during rush hour traffic in the mornings and afternoons. Ambient CO concentrations attain the air quality standards due to two statewide programs: 1) the 1992 wintertime oxygenated gasoline program, and 2) Phase I and II of the reformulated gasoline program. New vehicles with oxygen sensors and fuel injection systems have also contributed to reduced CO emissions. **Air Quality Table 5** shows the maximum 1-hour and 8-hour CO concentrations at the Costa Mesa/North Coastal Orange County station. These values are well below respective ambient air quality standards.

AIR QUALITY Table 5
Attainment Criteria Pollutants Concentrations, 2007-2012 (ppm)

Pollutants	Averaging Time	2007	2008	2009	2010	2011	2012
CO	1 hour	5	3	3	2	3	2.1
CO	8 hours	3.1	2	2.2	2.1	2.2	1.7
SO_2	State 1 hour	0.01	0.01	0.01	0.01	0.008	0.006
SO_2	Federal 1 hour (99^{th} Percentile)	-	-	0.004	0.002	0.005	0.002
SO_2	24 hours	0.004	0.003	0.004	0.002	0.001	0.001

Source: SCAQMD 2013d, ARB 2013c, EPA 2013c.

Sulfur Dioxide

Sulfur dioxide is typically emitted as a result of the combustion of fuels containing sulfur. This proposed project would use natural gas, which contains very little sulfur and consequently has very low SO_2 emissions when burned. By contrast, fuels with high sulfur content, such as coal, emit very large amounts of SO_2 when burned. Sources of SO_2 emissions come from every economic sector and include a wide variety of fuels in gaseous, liquid and solid forms. The whole state is designated attainment for all state and federal SO_2 ambient air quality standards. See **Air Quality Table 5** for maximum 1-hour, federal 1-hour, and 24-hour SO_2 concentrations at the Costa Mesa station.

Summary of Existing Ambient Air Quality

In summary, staff recommends using the background ambient air quality concentrations in **Air Quality Table 6** as the baseline for the modeling and impacts analysis. The highest criteria pollutant concentrations from the last three years of available data collected at the monitoring stations are used to determine the recommended background values. Concentrations in excess of their ambient air quality standard are shown in bold and shaded.

The pollutant modeling analysis was limited to the pollutants listed in **Air Quality Table 6**. Therefore recommended background concentrations were not determined for the other criteria pollutants (ozone, lead, visibility, etc.).

PROJECT DESCRIPTION AND PROPOSED EMISSIONS

The proposed HBEP would consist of two three-on-one combined-cycle power blocks. The new stationary sources of emissions in each power block would be three Mitsubishi Power Systems Americas (MPSA) 501DA combustion turbine generators (CTG), coupled with one steam turbine, and an air cooled condenser (HBEP 2012a).

Separate emissions estimates for the proposed project during the construction phase, initial commissioning, and operation are each described next.

PROPOSED CONSTRUCTION EMISSIONS

Construction of the HBEP is expected to take about 90 months, which includes demolition of existing structures and construction of the new electrical generating components. The construction of the HBEP would require removal of the existing Huntington Beach Generating Station's Units 1 through 5. The duration and complexity of construction activities are due in part to the desire of the project owner and the California Independent System Operator to have continuity of generation and/or reactive power from the site. Therefore, there would be concurrent operation, demolition, commissioning and construction activities throughout the construction period.

Air Quality Table 6
Staff-Recommended Background Concentrations (µg/m^3)

Pollutant	Averaging Time	Background	Limiting Standard	Percent of Standard
PM10	24 hour	45	50	90
	Annual	**24.2**	20	**121**
PM2.5	24 hour	28.3	35	81
	Annual	11.0	12	92
CO	1 hour	3,450	23,000	15
	8 hour	2,444	10,000	24
NO_2	State 1 hour	139	339	41
	Federal 1 hour	105	188	56
	Annual	21	57	37
SO_2	1 hour	26	655	4
	Federal 1 hour	13	196	7
	24 hour	5	105	5

Source: SCAQMD 2013d, ARB 2013c, EPA 2013c and independent staff analysis.
Note: An exceedance is not necessarily a violation of the standard, and that only persistent exceedances lead to designation of an area as nonattainment.

Onsite demolition activities would include the demolition of Units 1, 2 and 5. Demolition of existing Units 3 and 4 is not part of the HBEP project definition because it is part of the Huntington Beach Modernization Project and demolition of Units 3 and 4 were approved as part of that project. However, demolition of these two units is included as part of the cumulative impact assessment for HBEP. Demolition of existing Unit 5 includes removal of the non-operational Unit 5 peaker unit, the buildings and small tanks associated with Unit 5, and a fuel oil storage tank. Demolition of existing Units 1 and 2 would include an organized, top down dismantling of the existing boiler units, generator, and the common stack. Onsite construction activities would consist of installing six new combined cycle gas turbines, various auxiliary equipment, and administrative structures.

During the construction period, air emissions would be generated from: 1) vehicle and construction equipment exhaust; 2) fugitive dust from vehicle and construction equipment, including grading and bulldozing during construction of HBEP Block 1 and Block 2; and 3) fugitive dust from demolition activities such as the top-down removal of the Unit 1 and 2 common boiler stack and loading waste haul trucks with the generated debris. Construction activities would be scheduled as 10 hours per day, 23 days per month (HBEP2012a).

Estimates for the highest daily emissions and total annual emissions over the 90-month construction period are shown in **Air Quality Table 7**. The maximum daily emissions and monthly emissions are reported during the overlap of Block 1 and Block 2 construction, which is between month 36 to month 45.

Air Quality Table 7
HBEP, Estimated Maximum Construction Emissions

Construction Activity	NOx	VOC	PM10	PM2.5	CO	SOx
Maximum Daily Construction Emissions (lbs/day)	79.5	12.7	17.0	7.54	88.1	0.20
Maximum Monthly Construction Emissions (lbs/month)	1829	291	396	173.32	2026	4.56
Peak Annual Construction Emissions (tons/year)	8.6	1.3	1.88	0.72	9.1	0.02

Source: HBEP2014e.
Note: Different activities have maximum emissions at different times during the construction period; therefore, total maximum daily, monthly, and annual emissions might be different from the summation of emissions from individual activities.

Proposed Initial Commissioning Emissions

New electrical generation facilities must go through initial commissioning phases before becoming commercially available to generate electricity. The commissioning period begins when the turbines are prepared for first fire and ends upon successful completion of initial performance testing. During this period, initial firing causes greater NOx and CO emissions than those that occur during normal operations because of the need to tune the combustor, conduct numerous startups and shutdowns, operate under low loads, and conduct testing before emission control systems are functioning or fine-tuned for optimum performance. Gas turbine suppliers can have different commissioning period requirements.

The applicant expects the total duration of the commissioning period for each block to be up to 180 days. Each turbine needs up to 491 hours of operation to accomplish the various commissioning activities. **Air Quality Table 8** presents the applicant's anticipated maximum commissioning emissions of criteria pollutants for the turbines. Maximum hourly emissions for NOx and CO would occur during steam blow phases. Maximum hourly emissions for VOC would occur in CTG Testing phases (full speed, no load). Although NOx, CO and VOC emissions exceed operating condition emissions during commissioning, emission rates for PM and SOx during initial commissioning are not expected to be higher than normal operating emissions. This is because PM and SOx emissions are proportional to fuel use.

Air Quality Table 8
HBEP, Maximum Initial Gas Turbine Commissioning Emissions

Commissioning Source	NOx	VOC	PM10/ PM2.5	CO	SOx[a]
Each CTG (lb/hr)	109.7	383.8	9.5	3,169	2.78
Each CTG (tons/commissioning period)	4.1	7	1.5	56	0.53

Source: HBEP2012a, SCAQMD 2014a and independent staff analysis.
Note: [a] Based upon 0.75 gr/100 scf; worst case, short-term sulfur content of natural gas.

Proposed Operation Emissions

Air Quality Tables 9 through **11** summarize the maximum (worst-case) criteria pollutant hourly, daily and annual emissions associated with HBEP's normal and routine operation. Emissions for the combustion turbine system are based upon:

- NOx emissions are to be controlled to 2.0 parts per million by volume, dry basis (ppmvd) corrected to 15 percent oxygen, averaged over any 1-hour period;
- VOC emissions are to be controlled to 2.0 ppmvd with the use of good combustion practices and an oxidation catalyst;
- CO emissions are to be controlled to 2.0 ppmvd with the use of good combustion practices and oxidation catalyst;
- PM10/PM2.5 and SOx emissions are to be controlled to the minumum through the exclusive use of natural gas, inlet air filtration and oxidation catalyst system; and
- Average annual emissions are based on 5,900 hours of base load operation without duct burner firing per turbine per year, 470 hours of base load operation with duct burner firing per turbine per year, and 624 startups and shutdowns per turbine per year. (SCAQMD 2014a)

Air Quality Table 9 lists the maximum hourly emissions from each CTG estimated by the applicant. Emissions for NOx, CO, and VOC during startup and shutdown events would have higher emissions than during normal operation. Therefore the maximum hourly NOx, CO and VOC emissions are based on a turbine cold startup or shutdown. Since PM10/PM2.5 and SOx emissions are proportional to fuel use, PM10/PM2.5 and SOx have higher emissions rates during full-load operation. Therefore the maximum hourly PM10/PM2.5 and SOx emissions are based on each turbine operating at full load with duct burners firing at 32°F ambient temperature.

Air Quality Table 9
HBEP, Maximum Hourly Emissions Rates during Routine Operation (pounds per hour [lb/hr])

Source	NOx	VOC	PM10/ PM2.5	CO	SOx
Each CTG	25.5	31.8	9.5	115.3	2.78

Source: HBEP2012a, SCAQMD 2014a and independent staff analysis.

Air Quality Table 10 lists maximum allowable daily emissions of the proposed HBEP. Daily emissions are calculated for 3 typical operating scenarios. The first scenario assumes 1 cold start up and shutdown in the day, and the remaining hours at full load, with 5 hours of duct firing. The second scenario assumes 1 cold start up, 3 hot starts, 4 shutdowns, and the remaining hours at full load, with 5 hours of duct firing and 30 minutes of downtime between each hot start. The third scenario assumes 24 hours at full load operation with 5 hours of duct firing. The maximum allowable daily emissions will be the maximum emissions of these three scenarios. These operating scenarios are used in the revised PDOC page 89 to derive an expected range of daily emissions.

Air Quality Table 10
HBEP, Maximum Daily Emissions during Routine Operation (pounds per day [lb/day])

Source	Duration (hours)	NOx	VOC	PM10/ PM2.5	CO	SOx
Scenario 1						
Cold Start	1.5	172.2	167.4	40.5	695.4	18.72
Normal Operation (include 5 hrs duct burning)	22.33	1587.78	548.1	752.94	966.66	299.7
Shutdown	0.17	54	186	4.5	271.8	1.98
Total	24	1813.98	901.5	797.94	1933.26	320.4
Scenario 2						
Cold Start	1.5	172.2	167.4	40.5	695.4	18.72
Normal Operation (includes 5 hrs -duct burning)	18.7	1348.2	465.36	654.9	820.74	254.4
Shutdown (4)	2.72	216	744	18	1087.2	7.92
Downtime	1.5	0	0	0	0	0
Hotstart (3)	1.62	298.8	367.2	43.92	604.8	20.34
Total	24	2035.2	1743.96	757.32	3208.14	301.38
Scenario 3						
Normal Operation (include 5 hrs duct burning)	24	1698	586.2	798	1033.8	320.5
Maximum of Three Scenarios						
Maximum Facility Total (Six Turbines)		2,035	1,744	798	3,208	321

Source: HBEP2012a, SCAQMD 2014a and independent staff analysis.

Air Quality Table 11 lists maximum potential annual emissions from the proposed project, based on applicant and district calculations reviewed by staff. The operating profile includes 5,900 hours normal operation without duct burner firing, 470 hours normal operation with duct burner firing, and 624 startups and shutdowns (including 24 cold startups for 36 hours, 150 warm startups for 81.3 hours, 450 hot startups for 243.8 hours and 624 shutdowns for 104 hours) per year.

AIR QUALITY Table 11
HBEP, Maximum Annual Emissions during Routine Operation (lbs/yr)

Source	Duration (hours)	NOx	VOC	PM10/ PM2.5	CO	SOx
Cold Starts	36	688.8	669.6	162	2781.6	74.88
Warm Starts	81.25	2490	3150	366	6900	169.5
Hot Starts	243.75	7470	9180	1098	15120	508.5
Shutdowns	104	5616	19344	468	28267.2	205.92
Normal Operation (no duct firing)	5900	60770	21240	26550	37170	3717
Normal Operation (w/ duct firing)	470	6627	2303	4465	4042	408.9
Total (Each Turbine)	**6835**	**83661.8**	**55886.6**	**33109**	**94280.8**	**5084.7**
Facility Total (Six Turbines) (Tons/year)	**6835**	**251.0**	**167.7**	**99.3**	**282.8**	**15.3**

Source: HBEP2012a, SCAQMD 2014a and independent staff analysis.

Ammonia Emissions

Ammonia (NH_3) is injected into the flue gas stream as part of the selective catalytic reduction (SCR) system that controls NOx emissions. In the presence of the catalyst, the ammonia and NOx react to form harmless elemental nitrogen and water vapor. However, not all of the ammonia reacts with the flue gases to reduce NOx; a portion of the ammonia passes through the SCR and is emitted unaltered from the stacks. These ammonia emissions are known as ammonia slip.

The applicant reported that the maximum ammonia emission of MPSA 501DA turbine is 5 ppmvd @15 percent O_2 with or without duct burner firing (HBEP 2012a). The SCAQMD also requires a maximum ammonia emissions rate of 5 ppm at 15 percent oxygen by dry volume (ppmvd) in the flue gas (SCAQMD 2014a). Energy Commission staff notes that control systems can be operated and maintained to routinely achieve less than 5 ppmvd @15 percent O_2 for ammonia slip, as established in the Guidance for Power Plant Siting (ARB 1999). Staff recommends that the Energy Commission impose a 5 ppm at 15 percent oxygen by dry volume ammonia limit on this project.

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

METHOD AND THRESHOLD FOR DETERMINING SIGNIFICANCE

Staff characterizes air quality impacts as follows: all project emissions of nonattainment criteria pollutants and their precursors (NOx, VOC, PM10, PM2.5, and SOx) are considered significant and must be mitigated. For relatively short-term construction activities that essentially cease before operation of the power plant, our assessment is qualitative and mitigation consists of controlling construction equipment tailpipe emissions and fugitive dust emissions to the maximum extent feasible. For operating emissions, mitigation includes both the Best Available Control Technology (BACT) and emission reduction credits (ERC) or other valid emission reductions to mitigate emissions of nonattainment criteria pollutants and their precursors.

The ambient air quality standards used by staff as the basis for characterizing project impacts are health-based standards established by the ARB and U.S. EPA. They are set at levels that contain a margin of safety to adequately protect the health of all people, including those most sensitive to adverse air quality impacts such as the elderly, persons with existing illnesses, children, and infants.

DIRECT/INDIRECT IMPACTS AND MITIGATION

Ambient air quality impacts occur when project emissions cause the ambient concentration of a pollutant to increase. Project-related emissions are the actual mass of emitted pollutants, which are dispersed in the atmosphere before reaching the ground. Analysis begins with quantifying the emissions, and then uses an atmospheric dispersion model to determine the probable change in ground-level concentrations due to the project.

Dispersion models complete the complex, repeated calculations that consider emissions in the context of various ambient meteorological conditions, local terrain, and nearby structures that affect air flow. For the HBEP, the surface meteorological data used as an input to the dispersion model included five years (2008-2012) of meteorology data from John Wayne Airport monitoring station.

The applicant conducted the air dispersion modeling based on guidance presented in the *Guideline on Air Quality Models* (EPA, 2005) using the American Meteorological Society/Environmental Protection Agency Regulatory Model known as AERMOD (version 12345). The U.S. EPA designates AERMOD as a “preferred” model for refined modeling in all types of terrain. For determining NO_2 impacts of short-term emissions (1-hour averaging period), NO_2 concentrations were determined using the Ambient Ratio Method (ARM) with NO_x to NO_2 ambient ratio of 0.8.

Project-related modeled concentrations were then added to highest background concentrations to arrive at the total impact of the project even if they are not likely to occur at the same time. The total impact is then compared with the ambient air quality standards for each pollutant to determine whether the project’s emissions would either cause a new violation of the ambient air quality standards or contribute to an existing violation.

The federal 1-hour NO_2 and 24-hour PM2.5 standards are statistically based (i.e., the three year average of the 98th percentile values cannot exceed the applicable limit). In order to demonstrate compliance with these standards, the modeled impacts from the project were added to hourly background concentrations conservatively derived from the measured ambient background levels. The resulting impacts were then evaluated following EPA guidance to demonstrate compliance with the statistical standard.

Construction Impacts and Mitigation

This section discusses the project’s direct construction ambient air quality impacts assessed by the applicant and, as necessary, independently assessed by Energy Commission staff. The ambient air quality impacts are modeled using AERMOD. Construction modeling for HBEP used five years of meteorological data (2008-2012 from John Wayne Airport station) prepared by SCAQMD.

Air Quality Table 12 summarizes the results of the modeling analysis for construction activities. The total impact is the sum of the existing background condition plus the maximum impact predicted by the modeling analysis for project activity. The values in **bold** and shaded in the Total Impact and Background columns represent the values that either equal or exceed the relevant ambient air quality standard.

Air Quality Table 12
HBEP, Construction-Phase Maximum Impacts (μg/m^3)

Pollutant	Averaging Time	Modeled Impact	Background	Total	Limiting Standard	Percent of Standard
PM10	24 hour	14.6	45	**59.6**	**50**	**119**
	Annual	2.31	**24.2**	**26.5**	**20**	**133**
PM2.5	24 hour[a]	4.71	28.3	33.0	**35**	94
	Annual	1.32	11.0	**12.3**	**12**	**103**
CO	1 hour	112	3,450	3,562	23,000	15
	8 hour	93.2	2,444	2,537.2	10,000	25
NO_2 [b]	State 1 hour	91.7	139	230.7	339	68
	Federal 1 hour[c]	-	-	183	188	97
	Annual	7.33	21	28.33	57	50
SO_2	State 1 hour	0.22	26	26.22	655	4
	Federal 1 hour[d]	0.22	13	13.22	196	7
	24 hour	0.04	5	5.04	105	5

Source: HBEP 2014a and 2014e with independent staff analysis.
[a] Total predicted concentration for the federal 24-hour PM2.5 standard is the maximum modeled concentration combined with the 3-year average of 98[th] percentile background concentrations.
[b] The maximum 1-hour and annual NO_2 concentrations include ambient NO_2 ratios of 0.80 and 0.75 respectively.
[c] Total predicted concentration for the federal 1-hour NO_2 standard is the maximum modeled concentration paired with the 3-year average of 98[th] percentile seasonal hourly background concentrations.
[d] Total predicted concentration for the federal 1-hour SO_2 standard is the maximum modeled concentration combined with the 3-year average of 99[th] percentile background concentrations.

Air Quality Table 12 shows that PM10 and PM2.5 emissions from construction would cause new exceedances or contribute to existing violations of PM10 and PM2.5 ambient air quality standards except of the 24-hour PM2.5 standard. Therefore, staff believes that particulate matter emissions from construction would cause a significant impact over the construction period. Those emissions can and should be mitigated to a level of insignificance. However, the modeling shows that the maximum PM10 and PM2.5 concentrations would remain near the project boundary, which is mostly industrialized land where the public has no access. Significant secondary impacts would also occur for PM10, PM2.5, and ozone because construction-phase emissions of particulate matter precursors (including SOx) and ozone precursors (NOx and VOC) would also contribute to existing violations of these standards.

As shown in **Air Quality Table 12**, background ambient air quality levels exceed the most restrictive annual PM10 standard of 20 μg/m^3 while the 24-hour PM10 standard and both the annual and 24-hour PM2.5 ambient background levels are close to their respective standards. Staff has worked diligently with the applicant to reduce the modeled construction impacts, including using more updated meteorological data, refining emissions calculations and the modeling, especially for PM10 and PM2.5. **Air Quality Table 13** shows the history of the construction modeling revisions. Although the latest modeling results (dated 04/2014) show that the project would still cause the annual PM2.5 standard and the 24-hour PM10 standard to become exceeded and contribute to the existing violation of the annual PM10 standard, the modeling results have been improved significantly from those in the original AFC.

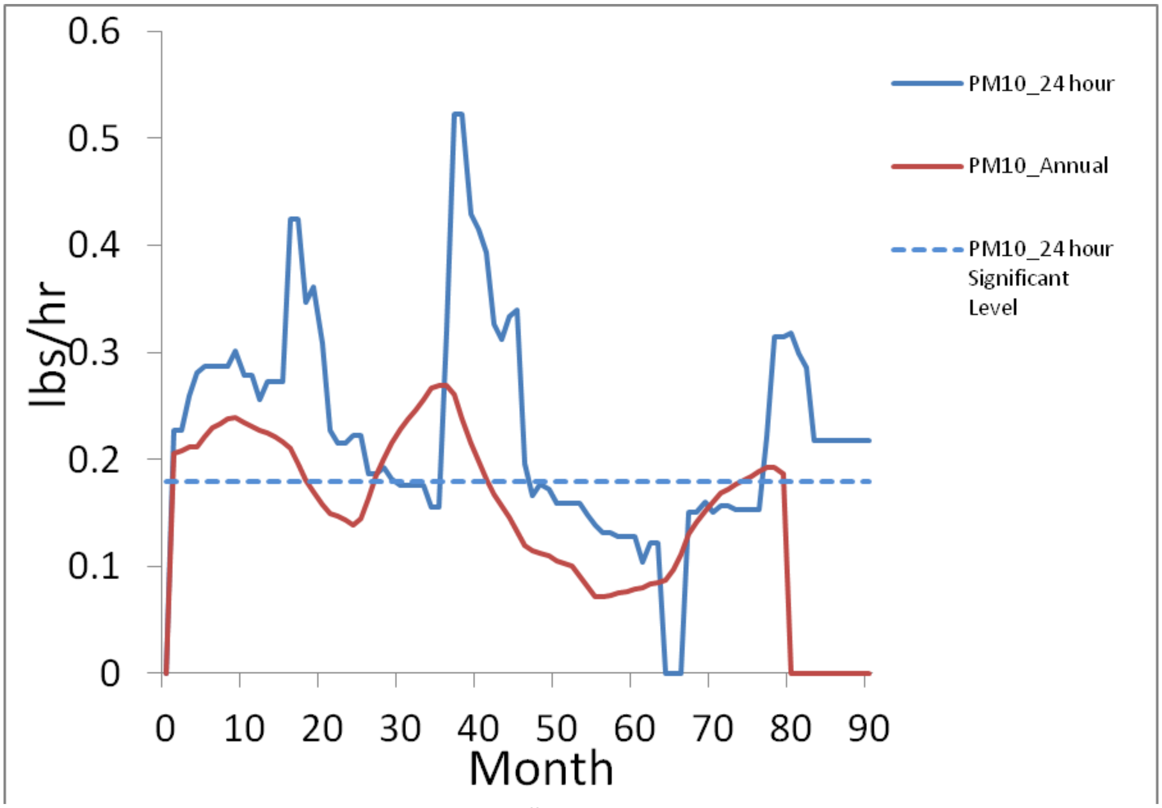
To determine worst-case impacts for both 24-hour and annual averages, the modeling assumes that the maximum emission rates occur during the entire 90-month construction period. However, maximum emissions are only expected to occur over a relatively short portion of the 90-month construction period. In order to estimate typical construction impacts for PM10 and PM2.5, staff calculated the emission rates for each month of construction to show monthly variations, since modeled impacts are proportional to the emission rates. **Air Quality Figure 1a** shows expected PM10 emissions rates for each month of the 90-month construction period. **Air Quality Figure 1b** shows expected PM2.5 emissions rates over the same period. The dotted line in each figure represents the emission rate above which the modeled impacts would exceed the corresponding air quality standard, called the “significant level” in the legend.

Since the annual PM10 background concentration is already above the standard, PM10 emissions from the project would not cause a new exceedance but would contribute to existing violations of this standard. Therefore, no significant level for annual PM10 is identified in that figure. As shown in **Air Quality Figure 1a**, 24-hour PM10 emission rates are above the significant level during about ¾ of the entire construction period. Therefore, PM10 emissions could cause exceedances of the 24-hour standard and thus create significant impacts during most of the 90-month construction period.

The anticipated PM2.5 emission rates are shown in **Air Quality Figure 1b**. Since the 24-hour PM2.5 impacts are below the standard, 24-hour PM2.5 emission rates are below the significance level during the entire construction period. The annual PM2.5 emission rates, when added to relatively high annual background levels at the site, would lead to impacts that would be above the annual standard during months 1 to 15 and months 29 to 37. PM2.5 emissions will create significant impacts during months identified above (total exceedance is about two years spread over about 37 months).

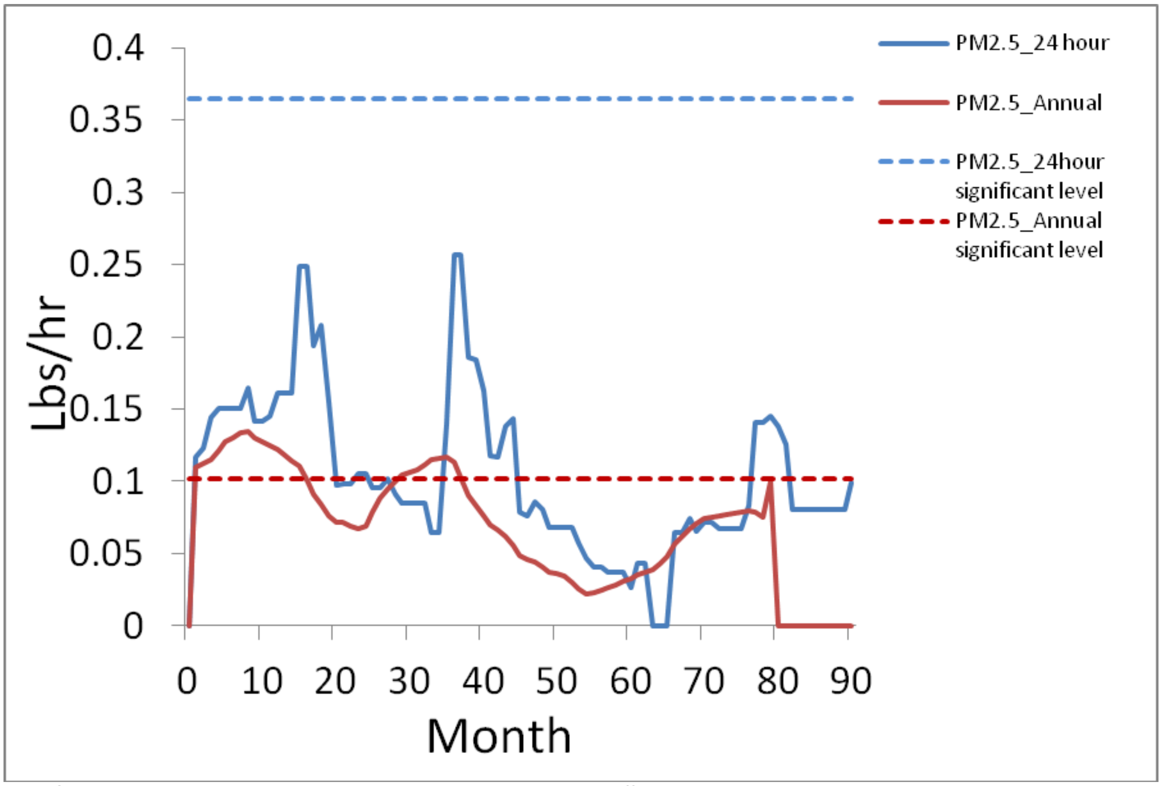
As shown in **Air Quality Table 12**, the direct impacts of NO_2, in conjunction with worst-case background conditions, would not create a new exceedance of the current annual or 1-hour NO_2 state ambient air quality standard. Compliance with the new federal 1-hour NO_2 standard, which is averaged over three years, is also evaluated because the construction is expected to last 90 months (7.5 years). The direct impacts of CO and SO_2 would not be significant because construction of the project would neither cause nor contribute to an exceedance of these standards.

Air Quality Figure 1a
HBEP, Worst Case Estimated Construction-Phase PM10 Emission Rates (lbs/hr)



Source: Table 5.1A 46R, HBEP 2014e, with independent staff analysis.
Note: Worst case emission rates for the 24-hour case are calculated from the worst daily emissions of the month divided by 24 hours/day. Worst case emission rates for the annual case are calculated from the rolling maximum yearly emissions divided by 8,760 hours/year.

Air Quality Figure 1b
HBEP, Worst Case Estimated Construction-Phase PM2.5 Emission Rates (lbs/hr)



Source: Table 5.1A 46R, HBEP 2014e, with independent staff analysis.
Note: Worst case emission rates for the 24-hour case are calculated from the worst daily emissions of the month divided by 24 hours/day. Worst case emission rates for the annual case are calculated from the rolling maximum yearly emissions divided by 8,760 hours/year.

Construction Mitigation

The applicant proposes the following mitigation measures to reduce the exhaust emissions from the diesel heavy equipment and fugitive dust emissions during the construction of the project:

- Watering unpaved roads and disturbed areas
- Limiting onsite vehicle speeds to 10 mph and post the speed limit
- Frequent watering during periods of high winds when excavation/grading is occurring
- Sweeping onsite paved roads and entrance roads on an as-needed basis
- Replacing ground cover in disturbed areas as soon as practical
- Covering truck loads when hauling material that could be entrained during transit
- Applying dust suppressants or covers to soil stockpiles and disturbed areas when inactive for more than 2 weeks
- Using ultra-low sulfur diesel fuel (15 ppm sulfur) in all diesel-fueled equipment
- Use of Tier III construction equipment where feasible

- Maintaining all diesel-fueled equipment per manufacturer's recommendations to reduce tailpipe emissions
- Limiting diesel heavy equipment idling to less than 5 minutes, to the extent practical
- Using electric motors for construction equipment to the extent feasible.

Since the latest modeling results in Air Quality Table 13 still show that PM10 and PM2.5 impacts during the approximately 7.5-year project construction period would cause exceedances of health-based ambient air quality standards and because staff determined that these impacts would be significant, staff recommended that additional mitigation measures need to be employed to further reduced construction period emissions and potential impacts. Based on staff's recommendation, the applicant has recently proposed to sweep roadways in the project vicinity during the construction period with SCAQMD-certified street sweepers. The applicant assumed that only the Pacific Coast Highway (PCH) would be swept and estimated the number of miles where sweeping would be required to mitigate the construction impacts. This mileage was calculated from the amount of emissions reduction required to get PM10 below the 24-hour standard (the annual PM10 standard is already exceeded by high background values), the control efficiency achieved by sweeping once per month, fugitive dust emission factors for paved roads, and daily vehicle traffic volume on the PCH. PM2.5 mileage was also computed but the result was a shorter distance and the PM10 distance is controlling.

The amount of PM10 emission reduction required was based on the estimated maximum daily emission rate resulting in a 24-hour modeled impact that, when combined with the background concentration of 45 $\mu g/m^3$, would be less than the most restrictive 24-hour PM10 standard. The amount of PM2.5 emission reduction required was based on the estimated maximum annual emission rate resulting in an annual modeled impact that, when combined with the background concentration of 11.0 $\mu g/m^3$, would be less than the most restrictive annual PM2.5 standard.

The calculated emission reduction required is 8.26 lbs/day for PM10 and 0.79 lbs/day for PM2.5. The corresponding sweeping miles to achieve these emission reductions are 3.34 miles for PM10 and 1.28 miles for PM2.5. Therefore the applicant proposes to sweep the PCH 3.5 miles once per month for the duration of the construction period. The effect of this additional mitigation would be to further reduce project impacts during construction.

Air Quality Table 13
HBEP, Modeled Project Construction Impacts Revisions ($\mu g/m^3$)

Pollutant	Averaging Time	Modeled Impact[a] (06/2012)	Modeled Impact[b] (03/2013)	Modeled Impact[c] (11//2013)	Modeled Impact[d] (01/2014)	Modeled Impact[e,f] (04/2014)
PM10	24 hour	333	218	72.8	35.8	14.6
	Annual	121	34.8	14.6	9.75	2.31
PM2.5	24 hour	84.0	48.2	15.5	11.0	4.71
	Annual	31.1	11.0	3.72	2.71	1.32
CO	1 hour	2,289	85.9	112	112	-
	8 hour	1,404	76.2	93.2	93.2	-
NO_2	State 1 hour	591	69.5	91.7	91.7	-
	Federal 1 hour	591	69.5	183	183	-
	Annual	155	6.71	7.33	7.33	-
SO_2	State 1 hour	4.74	0.16	0.22	0.22	-
	Federal 1 hour	4.74	0.16	0.22	0.22	-
	24 hour	0.836	0.04	0.04	0.04	-

Notes: [a] HBEP 2012a –Values shown in the original AFC
[b] HBEP 2013o –Values revised due to improved emissions controls
[c] HBEP 2013kk—Values further revised using updated meteorology data and additional emissions controls.
[d] HBEP 2014a—Values further revised using new meteorology data (HBEP 2013kk), improved emissions controls and updated emissions factors.
[e] HBEP 2014e—Values once again revised using improved emissions controls and updated emissions factors.
[f] Values used in Air Quality Table 12.

Adequacy of Proposed Mitigation

Staff generally concurs with the applicant's proposed mitigation measures, which mirror many of the staff's mitigation recommendations from previous siting cases. However, staff incorporates additional off-road equipment mitigation measures in staff-proposed conditions beyond those proposed by the applicant to implement all current staff recommendations used for other power plant projects.

Staff also agrees that the recently-proposed street sweeper or program is an effective way to further mitigate the PM impacts during the extended construction period. To implement this measure, staff proposes that the Energy Commission requires the applicant to develop and provide a street sweeping mitigation plan prior to initiating construction that details the sweeping program and provide the records of the operation of the sweeping program in Monthly Compliance Reports. While time does not allow the details of this plan to be developed at this time, staff believes the plan can rely on performance standards to achieve the needed emission reductions. For example, the plan would lay out how the applicant would obtain agreements from Caltrans or cities so they could safely sweep the PCH or other proposed roads in the vicinity of the project.

Staff Proposed Mitigation

Additional measures recommended by staff would reduce construction-phase impacts by further limiting construction emissions of particulate matter and combustion contaminants. Staff believes that the variable nature of construction activities warrants a qualitative approach to evaluation of the effectiveness of this additional mitigation. Construction emissions and the effectiveness of mitigation varies widely depending on variable levels of activity, the timing of specific work taking place, the specific equipment, soil conditions, weather conditions, and other factors, making precise quantification of emissions and air quality impacts difficult. Despite this uncertainty, there are a number of feasible control measures that can and should be implemented to significantly reduce construction period emissions. Staff has determined that the use of oxidizing soot filters is a viable emissions control technology for all heavy diesel-powered construction equipment that does not use an ARB-certified low emission diesel engine. In addition, staff proposes that, prior to the beginning of construction; the applicant should provide an Air Quality Construction Mitigation Plan (AQCMP) that specifically identifies all mitigation measures used to limit air quality impacts during construction.

Staff includes Conditions of Certification **AQ-SC1** through **AQ-SC5** to implement these requirements. These conditions update the applicant's proposed mitigation measures to be consistent with the conditions of certification adopted in similar prior Energy Commission licensing cases. Compliance with these conditions is expected to mitigate air quality impacts to be less than significant during construction of the HBEP.

As proposed by the applicant, staff also includes Condition of Certification **AQ-SC6** to further mitigate the PM emissions by using a local street sweeping program during the construction period. Staff concurs with the applicant that the construction emissions required to be mitigated are 8.26 lbs/day for PM10 and 0.79 lbs/day for PM2.5. However, since the streets to be swept are offsite, staff believes that an off-site offset ratio of 1.2:1, which is typically used by SCAQMD, is more appropriate to be used to determine the total emissions to mitigate. Staff is concerned that the sweeping of the Pacific Coast Highway (PCH) may not be practical due to the high traffic volumes and safety concerns. The local city streets in the project vicinity may be more suitable for the street sweeping program. In addition, if the street sweeping is already routinely performed on the nearby roads, some alternative approaches may be needed, such as using new, or more efficient or lower-emitting street sweepers. The plan should also include, but not limited to, the approval of sweeping from the control agency who is in charge of the roads, the timing of sweeping to avoid other impacts (traffic, noise, etc), the specifics of the type of street sweeper to be used, the traffic control and other logistics necessary during the street sweeping, and water use requirements that may affect this mitigation if a wet sweeper is used, especially in a severe drought. The applicant proposed using the PCH for street sweeping, although they listed additional roads that could be used and the associated traffic volumes. These may prove to be a more effective option because they are closer to the construction zone. The applicant should address all issues identified above in a construction period street sweeping PM mitigation plan required by **AQ-SC6**. Staff believes that the significant PM impacts during the construction can be reduced to less than significant by this street sweeping program.

Operation Impacts and Mitigation

The following section discusses ambient air quality impacts that were estimated by the applicant and subsequently evaluated by Energy Commission staff. The applicant performed a number of direct impact modeling analyses for routine operations, including modeling for impacts during commissioning activities.

Routine Operation Impacts

A refined dispersion modeling analysis was performed by the applicant to identify off-site criteria pollutant impacts that would occur from routine operational emissions throughout the life of the project. The worst case 1-hour NO_2 and CO impacts reflect startup impacts, and all other impacts reflect impacts that would occur during normal operation. The modeled impacts are extremely conservative, since the maximum impacts are evaluated under a combination of highest allowable emission rates, the most extreme meteorological conditions, and worst case background values, which are unlikely to all, occur simultaneously. Emissions rates are shown in **Air Quality Tables 9** to **11**. The predicted maximum concentrations of criteria pollutants are summarized in **Air Quality Table 14**. The values shown in bold and shaded means they exceed ambient air quality standards.

Air Quality Table 14
HBEP, Routine Operation Maximum Impacts (μg/m^3)

Pollutant	Averaging Time	Modeled Impact	Background	Total	Limiting Standard	Percent of Standard
PM10	24 hour	4.7	45	49.7	50	99
	Annual	**0.27**	**24.2**	**24.47**	**20**	**122**
PM2.5	24 hour[a]	4.7	28.3	33.0	35	94
	Annual	0.27	11.0	11.27	12	94
CO	1 hour	333	3,450	3,783	23,000	16
	8 hour	78	2,444	2,522	10,000	25
NO_2 [b]	State 1 hour	58.8	139	197.8	339	58
	Federal 1 hour[c]	58.8	105	163.8	188	87
	Annual	0.5	21	21.5	57	38
SO_2	State 1 hour	7.1	26	33.1	655	5
	Federal 1 hour[d]	7.1	13	20.1	196	10
	24 hour	2.4	5	7.4	105	7

Source: HBEP 2013kk with independent staff analysis.
Note:
[a] Total predicted concentration for the federal 24-hour PM2.5 standard is the maximum modeled concentration combined with the 3-year average of 98th percentile background concentrations.
[b] The maximum 1-hour and annual NO_2 concentrations include ambient NO_2 ratios of 0.80 and 0.75 respectively.
[c] Total predicted concentration for the federal 1-hour NO_2 standard is the maximum modeled concentration combined with the 3-year average of 98th percentile background concentrations.
[d] Total predicted concentration for the federal 1-hour SO_2 standard is the maximum modeled concentration combined with the 3-year average of 99th percentile background concentrations.

Air Quality Table 14 shows that the project will not cause a significant impact except annual PM10 emissions, which would contribute to existing violations of annual PM10 ambient air quality standards. The impacts of PM2.5 and 24-hour PM10 are close to the most stringent standards due to the existing high background concentrations, but would not create new violations. The 24-hour PM10 impact from the facility would exceed the CEQA significant increase level of 2.5 μg/m^3 defined by SCAQMD's CEQA guidance. This value is defined in district Rule 1303 Table A-2. However, as an Energy Commission jurisdictional project using district Rule 1304, HBEP is exempted from Rule 1303, as well as any findings about, or comparisons to, the Significant Change in Air Quality Concentrations in Rule 1303 Table A-2. Therefore, staff believes that HBEP would not have a significant 24-hour PM10 impact.

The direct impacts of NO_2, in conjunction with worst-case background conditions, would not create a new violation of the current federal or state NO_2 ambient air quality standard, including the new federal 1-hour NO_2 standard. The direct impacts of CO and SO_2 would not be significant because routine operation of the project would neither cause nor contribute to a violation of these standards. Mitigation for emissions of PM10, PM2.5, SOx, NOx, and VOC would be appropriate for reducing impacts to PM10, PM2.5, NO_2, and ozone.

Secondary Pollutant Impacts

The project's gaseous emissions of NOx, SOx, VOC, and ammonia are precursor pollutants that can contribute to the formation of secondary pollutants, ozone, PM10, and PM2.5. Gas-to-particulate conversion in ambient air involves complex chemical and physical processes that depend on many factors, including local humidity, pollutant travel time, and the presence of other compounds. Currently, there are no agency-recommended models or procedures for estimating secondary pollutant ozone or particulate nitrate or sulfate formation from a single project or source. However, because of the known relationships of NOx and VOC to ozone and of NOx, SOx, and ammonia emissions to secondary PM10 and PM2.5 formation, it can be said that unmitigated emissions of these pollutants would contribute to higher ozone and PM10/PM2.5 levels in the region. Mitigating SOx and NOx emissions would both avoid significant secondary PM10/PM2.5 impacts and reduce secondary pollutant impacts to a less than significant level.

Ammonia (NH_3) is a particulate precursor but not a criteria pollutant because there is no ambient air quality standard for ammonia. Reactive with sulfur and nitrogen compounds, ammonia can be found from natural sources, agricultural sources, and as a byproduct of tailpipe controls on motor vehicles and stack controls on power plants.

Energy Commission staff recommends limiting ammonia slip emissions to the maximum extent feasible. This level of control is appropriate for avoiding unnecessary ammonia emissions, consistent with staff policy to reduce emissions of all nonattainment pollutant precursors to the lowest feasible levels. Consistent with the reported maximum pollutant emission rates for the MPSA 501DA (HBEP 2012a), staff recommends an ammonia slip limit of 5 ppmvd at 15 percent oxygen.

Commissioning Phase Impacts

Commissioning phase impacts would occur over a short-term period needed to complete the commissioning. The commissioning of each of the two HBEP power blocks is expected to be completed within 180 calendar days. The commissioning emissions estimates are based on partial load operations before the emission control systems become operational, and are shown in **Air Quality Table 8**.

Since the commission periods for Block 1 and Block 2 would not occur within the same year, it is assumed that the maximum predicted impacts for the simultaneous commissioning of all three units at Block 2 combined with the cold startup of all three units at Block 1 would be greater than the predicted impacts from the commissioning or cold startup of Block 1 only. It was also assumed that the maximum impact would occur if all three turbines were simultaneously undergoing commissioning activities with the highest unabated emissions. Therefore, the modeling of short term NO_2 and CO impacts are based on the simultaneous commissioning of all three units at Block 2 combined with the cold startup of all three units at Block 1. The federal 1-hour NO_2 standard is expressed as a 3-year average of the 98th percentile of the daily maximum 1-hour concentration. Since this is a statistically based standard, it is not applicable to the short-duration commissioning phase. Staff does not expect it to have significant impact due to the very limited commissioning period compared to the 3-year averaging time used for the standard. The annual NO_2 impact is also not evaluated due to the short commissioning period. Impacts due to PM10, PM2.5, and SO_2 during commissioning would occur under similar exhaust conditions as those for startup while in routine operation because these emissions are proportional to fuel use. As a result, the SO_2, PM10, and PM2.5 impacts from commissioning activities are the same as those from normal operation, as shown in **Air Quality Table 14**.

Air Quality Table 15 shows that the commissioning phase emissions will not cause new exceedances of any state or federal ambient air quality standard.

Air Quality Table 15
HBEP, Commissioning Phase Maximum Impacts (μg/m^3)

Pollutant	Averaging Time	Modeled Impact	Background	Total	Limiting Standard	Percent of Standard
CO	1 hour	5,076	3,450	8,526	23,000	37
	8 hour	4,369	2,444	6,813	10,000	68
NO_2	1 hour (state)	146.3	139	285.3	339	84

Source: SCAQMD 2014a with independent staff analysis.

Mitigation for Routine Operation

Applicant's Proposed Mitigation

The HBEP includes a combination of BACT and emission reduction credits to mitigate air quality impacts. The equipment description, equipment operation, and emission control devices are provided in **PROJECT DESCRIPTION AND PROPOSED EMISSIONS** (above).

Emission Controls

HBEP proposes the use of dry low NOx combustors with selective catalytic reduction (SCR) to control NOx emissions to 2.0 ppmvd (1-hour average) with and without duct burning. The BACT for CO emissions is best combustion design and the installation of the oxidation catalyst system to reduce CO to 2.0 ppmvd (1-hour) with and without duct burning. The BACT for VOC emissions is best combustion design and the installation of an oxidation catalyst system to control VOC emissions to 2.0 ppmvd (1-hour) with and without duct burning. Best combustion practice, use of pipeline-quality natural gas, and use of inlet air filtration limit PM10/PM2.5 emissions to 4.5 lb/hr without duct burning and 9.5 lb/hr with duct burning. Operating exclusively on low sulfur pipeline quality natural gas with fuel sulfur content of no more than 1 grain per 100 standard cubic feet limits SOx emissions. Generally the actual sulfur content is about 0.25 grains per 100 standard cubic feet of fuel.

GHG pollutants are emitted during the combustion process when fossil fuels are burned. The applicant conducted a top-down GHG BACT analysis and determined that thermal efficiency is the only technically feasible control technology that is commercially available and applicable for the HEBP. The HBEP has concluded that the BACT for GHG emissions is an emission rate of 1,054 pounds CO_2/MWhr of gross energy output. Degradation over time and turndowns, startup, and shutdown are incorporated into these limits. See Air Qualaity Appendix Air-1 for more discussion of greenhouse gases.

Emission Offsets

District Rule 1303(b)(2) requires that all increases in emissions be offset unless exempt from offset requirements pursuant to district Rule 1304, as described next.

District Rule 1304(a)(2) –Electric Utility Steam Boiler Replacement states that if electric utility boilers are replaced by advanced gas turbines, including combined cycle and simple cycle configurations[1] the project would be exempt from emission offset requirements unless there is a basin-wide electricity generation capacity increase on a per-utility basis. If there is an increase in basin-wide capacity, only the increased capacity must be offset via traditional offset rules and regulations. SCAQMD Rule 1135 defines advance combustion sources as those which emit NOx at no greater than 0.10 lb/net MWh on a daily average basis, excluding commissioning, start-up and shutdown periods, if the source is located within the South Coast Air Basin. The MPSA 501DA gas turbine is a combined cycle gas turbine and complies with this rule.

The language of this exemption allows for exemptions from offset and modeling normally required if the in-basin megawatt capacity of the utility receiving the facility's energy does not increase. The purpose was to facilitate the removal of older and less efficient boiler/steam turbine technology with cleaner gas turbine technology at the utilities. Since the advent of RECLAIM, the exemption was expanded to include modifications conducted for compliance with Regulation XX rules.

The SCAQMD's revised PDOC shows the total power generating capacity from the proposed six MPSA 501DA turbines would be 972 MW gross and 939 MW net. Maximum capacity is determined at 32°F ambient temperature. The HBEP output would be limited by Conditions of Certification **AQ-14** and **AQ-15**. In order to qualify for the exemption, the applicant is proposing to shut down 4 boilers in conjunction with the construction of the new HBEP. The 4 boilers include boilers 1 (215 MW) and 2 (215 MW) at the Huntington Beach site, as well as boilers 6 (175 MW) and 8 (480 MW) at the AES' Redondo Beach Generating Facility. The total capacity of the boilers being shutdown is 1,085 MWs. Therefore the net megawatts would decrease and the new power generating system would qualify for the Rule 1304(a)(2) exemption. Thus, the facility does not have to provide emission reduction credits for VOC and PM10 emissions of the new gas turbines. Instead, the VOC and PM10 emissions of the new gas turbines would be fully offset from SCAQMD's internal bank.

[1] The source is replacement of electric utility steam boiler(s) with combined cycle gas turbine(s), intercooled, chemically-recuperated gas turbines, other advanced gas turbine(s); solar, geothermal, or wind energy or other equipment, to the extent that such equipment will allow compliance with Rule 1135 or Regulation XX rules.

District Rule 1304.1 – Electrical Generating Fee for Use of Offset Exemption requires electrical generating facilities which use the specific offset exemption described in Rule 1304(a)(2) [Electric Utility Steam Boiler Replacement] to pay fees for up to the full amount of offsets provided by the SCAQMD in accordance with Rule 1304. HBEP would be required to demonstrate compliance with the specific requirements of this rule prior to issuance of the Permits to Construct for the proposed facility. However, the timing and location(s) of these offsets would not be determined until that time.

Under Rule 2005, the HBEP would be subject to the Regional Clean Air Incentives Market (RECLAIM) program for NOx emissions. The facility would be required to demonstrate that it holds sufficient RECLAIM Trading Credits (RTCs) to offset the annual NOx emission increase for the first compliance period using a 1-to-1 offset ratio. Additionally, since the NOx potential to emit (PTE) after the commissioning year is greater than the facility's initially allocation, HBEP is required to hold NOx RTCs for each subsequent year. The HBEP is also in the SOx RECLAIM program. Therefore, SOx RTCs are required to be held to cover the first year of operation. Additionally, because the facility opted into SOx RECLAIM after 1994, there is no initial allocation. For this reason, SOx RTCs are required to be held for each compliance year after the first year of operation.

Air Quality Table 16 shows the California Environmental Quality Act (CEQA) mitigation that is provided for the emission impacts from the proposed project, which is based on the new source review (NSR) offsets/emissions identified in the SCAQMD's revised PDOC (SCAQMD 2014a) and staff's own analysis. Values shown in parentheses indicate emissions for routine operation while those without parentheses apply to the commissioning period.

The emissions shown in **Air Quality Table 16** are calculated from the maximum monthly emissions limits in the revised PDOC divided by 30 to produce the 30-day average lbs/day values (with the exception of NOx and SOx, which are pounds per year). Staff has found it appropriate to use the 30-day average lbs/day value for characterizing the project emission profile in the SCAQMD. That is due to the fact that the SCAQMD calculates ERCs on a 30-day lb/day average value as described below.

The project's emissions on a 30-day average is calculated by totaling the worst case month that the project is expected to have and dividing that total by 30 to create an estimate of the 30-day averaged daily emissions. A project must obtain ERCs for the 30-day average lbs/day value. A lbs/day average based on an annual average is always going to be lower than a lbs/day average based on a worst case month for the same emitting source. Any emitting source will always have a month where it emits more pollutants than any other month, but in an annual average this peak month is washed out over the year. Thus the lbs/day ERC calculation is more conservative than the lbs/day annual average emission calculation. Therefore, for projects located in the SCAQMD, staff uses the 30-day average lbs/day value to characterize the project emissions profile when comparing it to the ERCs being offered.

Air Quality Table 16[a]
CEQA Mitigation (30-day average lbs/day)

	NOx (lbs/year)[a]	VOC	PM10	SOx (lbs/year)[b]
Emission Reduction Credits or RECLAIM Trading Credits	314,054(501,972)	0	0	21,638 (30,504)
1304 Exemption Credits	0	1,497.6	855.6	0
Total Credits	314,054(501,972)	1,497.6	855.6	21,638 (30,504)
CEQA Mitigation Needed	314,054 (501,972)	1,497.6	855.6	21,638 (30,504)
Further Mitigation Needed	None	None	None	None

Source: SCAQMD 2014a and independent staff analysis
Note:
[a] Values are subject to refinement in FDOC.
[b] NOx and SOx emissions for the commissioning year would be lower than non-commissioning years. All NOx and SOx emissions for both commissioning year and non-commissioning years (shown in parentheses) would be offset by RTCs.

District Rule 1325 requires a major PM2.5 facility to offset PM2.5 emissions at the offset ratio of 1.1:1. A major polluting facility is defined in the rule as a facility which has actual emissions, or a potential to emit of greater than 100 tons per year. HBEP is not a major PM2.5 facility because the total PM2.5 potential to emit of the facility would be 99.3 tons per year, which is less than the 100 tons per year threshold. Therefore, no PM2.5 offsets are required for HBEP.

Because the facility area is classified as attainment for CO, the district NSR regulations do not require ERCs for this pollutant. Staff does not require mitigation for this pollutant other than the installation of BACT and modeling to show that the proposed facility does not cause or contribute to a violation of a CO ambient air quality standard.

Adequacy of Proposed Mitigation

Staff believes that that the NOx and SOx RTCs are a valid mechanism to mitigate the NOx and SOx emissions due to the extensive monitoring and reporting requirement for the RECLAIM program.

Commission staff has long recommended that mitigation be provided by projects certified by the Energy Commission to address adverse air quality impacts. Emission reductions of nonattainment pollutants and their precursors at a minimum overall one-to-one ratio of annual operating emissions can provide this mitigation. For HBEP, the district would provide emission offsets from its internal bank that would meet or exceed a one-to-one offset ratio for all ozone and particulate matter precursors. Staff concludes that adverse impacts are mitigated for CEQA purposes by these emissions reductions. These offsets are required before beginning construction. Although PM2.5 emissions are not required to be offset separately from PM10 emissions, staff notes that the annual total offsets for PM10 would fully offset PM2.5 emissions. How the offsets provide PM2.5 mitigation is discussed separately in **SECONDARY POLLUTANT IMPACTS** (above).

Energy Commission staff's position for CEQA mitigation in this region is that all nonattainment pollutant and precursor emissions must be reduced by a ratio of at least one-to-one. As discussed above, the relationship of PM10/PM2.5 precursors to PM is well known, although the conversion process is complex. Staff concludes that providing CEQA mitigation at a minimum ratio of 1:1 will reduce secondary PM10/PM2.5 impacts to less than significant for the proposed facility modifications.

As shown in **Air Quality Table 16**, there are sufficient mitigation credits to fully offset the new emissions that would be expected to occur at the site from the new HBEP.

Staff's evaluation of the adequacy of project mitigation was determined solely based on the merits of this case, including the district offset requirements, the project's emission limits, the specific ERCs proposed, and ambient air quality considerations of the region, and does not in any way provide a precedence or obligation for the acceptance of offset proposals for any other current or future licensing cases.

Staff Proposed Mitigation

Staff proposes Conditions of Certification **AQ-SC7** to ensure that the license is amended as necessary to incorporate any future changes to the air quality permits and to ensure ongoing compliance during commissioning and routine operation through quarterly reports (**AQ-SC8**).

Overlap Periods Impacts and Mitigation

Due to the 7.5-year construction period, some construction activities would overlap with the operation of HBEP units. Therefore staff identified the overlappg periods and request the applicant to conduct impact analyses for all scenarios identified by staff. In addition, since the demolition of exsiting HBEP Units 3 and 4 is not part of the proposed project, its impact was not evaluated in the AFC. But the timing for demolition of Units 3 and 4 would also overlap some HBEP project activities. Therefore staff also requested the impact analysis for the overlap of Units 3 and 4 demolition with HBEP project activities and require evaluation. These overlapping activities are all evaluated below. For the statistically based standards (federal 1-hour NO_2 and SO_2, 24-hour PM2.5), the modeling assumes the overlap would occur during the full 3 years, which will overestimate the impacts. Therefore the modeling resutls for these standards are exremely conservative.

A. Block 1 Operation and Construction of Block 2

This scenario is intended to determine modeled impacts from the simultaneous operation of Block 1 and construction of Block 2 (3rd quarter, 2018 to 2nd quarter, 2020). The maximum modeled concentrations for this scenario are presented in **Air Quality Table 17** with **bold** and shading used to indicate exceedances**.**

Air Quality Table 17
Maximum Impacts from Block 1 Operation and Construction of Block 2 (μg/m^3)

Pollutant	Averaging Time	Modeled Impact	Background	Total	Limiting Standard	Percent of Standard
PM10	24 hour	**7.6**	**45**	**52.6**	**50**	**105**
	Annual	**1.25**	**24.2**	**25.5**	**20**	**128**
PM2.5	24 hour[a]	1.41	28.3	29.7	35	85
	Annual	0.24	11.0	11.2	12	93
CO	1 hour	97.9	3,450	3,547.9	23,000	15
	8 hour	53.8	2,444	2,497.8	10,000	25
NO_2 [b]	State 1 hour	63.0	139	202	339	60
	Federal 1 hour[c]	63.0	105	168	188	90
	Annual	3.38	21	24.38	57	43
SO_2	State 1 hour	1.32	26	27.32	655	4
	Federal 1 hour[d]	1.32	13	14.32	196	7
	24 hour	0.36	5	5.36	105	5

Source: HBEP 2013kk and 2014e with independent staff analysis.
[a] Total predicted concentration for the federal 24-hour PM2.5 standard is the maximum modeled concentration combined with the 3-year average of 98th percentile background concentrations.
[b] The maximum 1-hour and annual NO_2 concentrations include ambient NO_2 ratios of 0.80 and 0.75 respectively.
[c] Total predicted concentration for the federal 1-hour NO_2 standard is the maximum modeled concentration combined with the 3-year average of 98th percentile background concentrations.
[d] Total predicted concentration for the federal 1-hour SO_2 standard is the maximum modeled concentration combined with the 3-year average of 99th percentile background concentrations.

Staff believes that PM10 emissions during this overlap period (up to 12 months) would cause a significant impact because they would cause a new exceedance of the 24-hour PM10 standard which is not expected to occur during routine operation (see **Air Quality Table 14**) and would also contribute to the existing violation of the annual PM10 standard. The significant PM impacts are mainly due to high background concentrations and fugitive dust emissions during the construction period. However, the mitigation measures included in Conditions of Certification **AQ-SC1** through **AQ-SC6** are expected to reduce the potential for significant adverse air quality impacts as much as possible during construction. The direct impacts of CO, NO_2, SO_2 and PM2.5 would be less than significant because they would neither cause nor contribute to a violation of these standards.

B. HBEP Operation and Demolition of Units 1 and 2

This scenario is intended to determine modeled impacts from the simultaneous operation of HBEP units (block 1 and block 2) and demolition of Huntington Beach Generating Station Units 1 and 2 (4th quarter, 2020 to 3rd quarter, 2022). The maximum modeled concentrations for this scenario are presented in **Air Quality Table 18.**

Staff believes that PM10 emissions during this overlap period (up to 12 months) would cause a significant impact because they would cause new exceedances of the 24-hour PM10 ambient air quality standard and contribute to existing violation of the annual PM10standard, and that those emissions can and should be mitigated to a level of insignificance. Significant secondary impacts would also occur for PM10, PM2.5, and ozone because emissions of particulate matter precursors (including SOx) and ozone precursors (NOx and VOC) would also contribute to existing violations of these standards. The mitigation measures included in Conditions of

Certification **AQ-SC1** through **AQ-SC6** are expected to reduce the potential for significant adverse air quality impacts during construction. The direct impacts of CO, NO_2, SO_2 and PM2.5 would be less than significant because they would neither cause nor contribute to a violation of these standards.

C. HBEP Construction and Demolition of Units 3 and 4

This scenatio is intended to determine modeled impacts from the simultaneous demolition of Units 3 and 4 and development (contruction and demolition) of HBEP. The overlap period starts from the 2nd quarter of 2015. However, the end date is unknown to staff because the demolition of Units 3 and 4 is not a part of HBEP project and the schedule is not reported. The maximum modeled concentrations for this scenario are presented in **Air Quality Table 19.**

Staff believes that PM10 emissions during this overlap period would cause a significant impact because they would cause a new exceedance of the 24-hour PM10 standard and would contribute to the existing violation of the annual PM10 standard. Significant secondary impacts would also occur for PM10, PM2.5, and ozone because emissions of particulate matter precursors (including SOx) and ozone precursors (NOx and VOC) would also create new exceedances or contribute to existing violations of these standards.

Air Quality Table 18
Maximum Impacts from HBEP Operation and Demolition of Units 1 and 2 (μg/m³)

Pollutant	Averaging Time	Modeled Impact	Background	Total	Limiting Standard	Percent of Standard
PM10	24 hour	**16.1**	**45**	**61.1**	**50**	**122**
	Annual	**2.81**	**24.2**	**27.0**	**20**	**135**
PM2.5	24 hour[a]	3.70	28.3	32.0	35	91
	Annual	0.56	11.0	11.6	12	97
CO	1 hour	338	3,450	3,788	23,000	16
	8 hour	106	2,444	2,550	10,000	26
NO_2 [b]	State 1 hour	82.5	139	221.5	339	65
	Federal 1 hour[c]	-	-	174	188	93
	Annual	4.59	21	25.59	57	45
SO_2	State 1 hour	4.97	26	30.97	655	5
	Federal 1 hour[d]	4.97	13	17.97	196	9
	24 hour	1.23	5	6.23	105	6

Source: HBEP 2014a and 2014e with independent staff analysis.
[a] Total predicted concentration for the federal 24-hour PM2.5 standard is the maximum modeled concentration combined with the 3-year average of 98th percentile background concentrations.
[b] The maximum 1-hour and annual NO_2 concentrations include ambient NO_2 ratios of 0.80 and 0.75 respectively.
[c] Total predicted concentration for the federal 1-hour NO_2 standard is the maximum modeled concentration paired with the 3-year average of 98th percentile seasonal hourly background concentrations.
[d] Total predicted concentration for the federal 1-hour SO_2 standard is the maximum modeled concentration combined with the 3-year average of 99th percentile background concentrations.

The direct impacts of NO_2 would also create an apparent new exceedance of the new federal 1-hour NO_2 standard. However, staff does not expect this result to be significant due to the limited overlap period compared to the 3-year averaging time used for the standard. The direct impacts of PM2.5, CO and SO_2 would not be significant because they would neither cause nor contribute to a violation of these standards.

Air Quality Table 19
Maximum Impacts from HBEP Construction and Demolition of Units 3 and 4 ($\mu g/m^3$)

Pollutant	Averaging Time	Modeled Impact	Background	Total	Limiting Standard	Percent of Standard
PM10	24 hour	**15.0**	**45**	**60.0**	**50**	**120**
	Annual	**4.80**	**24.2**	**29.0**	**20**	**145**
PM2.5	24 hour[a]	4.29	28.3	32.6	35	93
	Annual	1.27	11.0	12.3	12	103
CO	1 hour	131	3,450	3,581	23,000	16
	8 hour	110	2,444	2,554	10,000	26
NO_2 [b]	State 1 hour	117	139	256	339	76
	Federal 1 hour [c]	**-**	**-**	**196**	**188**	**104**
	Annual	7.14	21	28.14	57	49
SO_2	State 1 hour	0.29	26	26.29	655	4
	Federal 1 hour[d]	0.29	13	13.29	196	7
	24 hour	0.054	5	5.054	105	5

Source: HBEP 2014a and 2014e with independent staff analysis.
[a] Total predicted concentration for the federal 24-hour PM2.5 standard is the maximum modeled concentration combined with the 3-year average of 98th percentile background concentrations.
[b] The maximum 1-hour and annual NO_2 concentrations include ambient NO_2 ratios of 0.80 and 0.75 respectively.
[c] Total predicted concentration for the federal 1-hour NO_2 standard is the maximum modeled concentration paired with the 3-year average of 98th percentile seasonal hourly background concentrations.
[d] Total predicted concentration for the federal 1-hour SO_2 standard is the maximum modeled concentration combined with the 3-year average of 99th percentile background concentrations.

Cumulative Impacts and Mitigation

"Cumulative impacts" are defined as "two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts" (CEQA Guidelines, §15355). Such impacts can be relatively minor and incremental yet still be significant because of the existing environmental background, particularly when considering other closely related past, present, and reasonably foreseeable future projects.

Criteria pollutants have impacts that are usually (though not always) cumulative by their nature. Rarely will a project itself cause a violation of a federal or state criteria pollutant standard. However, many new sources contribute to violations of criteria pollutant standards because of elevated background conditions. Air districts attempt to reduce background criteria pollutant levels by adopting attainment plans, which are multi-faceted programmatic approaches to attainment. Attainment plans typically include new source review requirements that provide offsets and use Best Available Control Technology, combined with more stringent emissions controls on existing sources.

The discussion of cumulative air quality impacts includes the following three analyses:

- a summary of projections for criteria pollutants by the air district and the air district's programmatic efforts to abate such pollution;
- an analysis of the project's "localized cumulative impacts" when combined with other local major emission sources; and
- a discussion of greenhouse gas emissions and global climate change impacts (see **AIR QUALITY APPENDIX AIR-1**).

Summary of Projections

The SCAQMD is the agency with principal responsibility for analyzing and addressing cumulative air quality impacts, including the impacts of ambient ozone and particulate matter. The SCAQMD has summarized the cumulative impact of ozone and particulate matter on the air basin from the broad variety of its sources. Analyses of these cumulative impacts, as well as the measures the SCAQMD proposes to reduce impacts to air quality and public health, are summarized in four publicly available documents that the SCAQMD has adopted. These adopted air quality plans are summarized below.

- **Final 2012 Air Quality Management Plan** (adopted 12/07/2012)

  Link: http://www.aqmd.gov/aqmp/2012aqmp/index.htm
- **Final 2007 Air Quality Management Plan** (adopted 06/01/2007)

  Link: http://www.aqmd.gov/aqmp/07aqmp/index.html
- **Final Socioeconomic Report for the Final 2012 AQMP** (adopted 12/07/2012)

  Link: http://www.aqmd.gov/aqmp/2012aqmp/Final/FinalSocioeconomicReport.pdf
- **State of California's SIP for the new federal PM2.5 and 8-hour ozone standards** (adopted June 20, 2011)

  Link: http://www.arb.ca.gov/planning/sip/2007sip/2007sip.htm

2012 Air Quality Management Plan

(The following paragraphs are excerpts from the Executive Summary of the 2012 Air Quality Management Plan adopted by the SCAQMD December 7, 2012)

The SCAQMD adopted (December 7, 2012) the 2012 Air Quality Management Plan (AQMP) primarily in response to changes in the federal Clean Air Act (CAA). The CAA requires an 24-hour PM2.5 non-attainment area to prepare a State Implementation Plan (SIP) revision by December 14, 2012. The SIP must demonstrate attainment with the 24-hour PM2.5 standard by 2014, with the possibility of up to a five-year extension to 2019, if needed. U.S. EPA approval of any extension request is based on the lack of feasible control measures to move forward the attainment date by one year. The District's attainment demonstration shows that, with implementation of all feasible controls, the earliest possible attainment date is 2014, and thus no extension of the attainment date is needed. In addition, the U.S. EPA requires that transportation conformity budgets be established based on the most recent planning assumptions (i.e., within the last five years) and approved motor vehicle emission models. The Final Plan is based on the most recent assumptions provided by both CARB and SCAG for motor vehicle emissions and demographic updates and includes updated transportation conformity budgets.

The Final 2012 AQMP outlines a comprehensive control strategy that meets the requirement for expeditious progress towards attainment with the 24-hour PM2.5 NAAQS in 2014 with all feasible control measures. The Plan also includes specific measures to further implement the ozone strategy in the 2007 AQMP to assist attaining the 8-hour ozone standard by 2023. The control measures contained in the Final 2012 AQMP can be categorized as follows:

1) *Basin-wide Short-term PM2.5 Measure. Measures that apply Basin-wide, have been determined to be feasible, will be implemented by the 2014 attainment date, and are required to be implemented under state and federal law. The main short-term measures are episodic, in that they only apply during high PM2.5 days and will only be implemented as needed to achieve the necessary air quality improvements.*

2) *Contingency Measures. Measures to be automatically implemented if the Basin fails to achieve the 24-hour PM2.5 standard by 2014.*

3) *8-hour Ozone Measures. Measures that provide for necessary actions to maintain progress towards meeting the 2023 8-hour ozone NAAQS, including regulatory measures, technology assessments, key investments, and incentives.*

4) *Transportation Control Measures. Measures generally designed to reduce vehicle miles travelled (VMT) as included in SCAG's 2012 Regional Transportation Plan.*

Many of the control measures proposed are not regulatory in form, but instead focus on incentives, outreach, and education to bring about emissions reductions through voluntary participation and behavioral changes needed to complement regulations.

The Basin faces several ozone and PM attainment challenges, as strategies for significant emission reductions become harder to identify and the federal standards continue to become more stringent. California's Greenhouse Gas reductions targets under AB32 add new challenges and timelines that affect many of the same sources that emit criteria pollutants. In finding the most cost-effective and efficient path to meet multiple deadlines for multiple air quality and climate objectives, it is essential that an integrated planning approach is developed. Responsibilities for achieving these goals span all levels of government, and coordinated and consistent planning efforts among multiple government agencies are a key component of an integrated approach. To this end, and concurrent with the development of the 2012 AQMP, the District, the Air Resources Board, and San Joaquin Valley Air Pollution Control District engaged in a joint effort to take a coordinated and integrated look at strategies needed to meet California's multiple air quality and climate goals, as well as its energy policies. California's success in reducing smog has largely relied on technology and fuel advances, and as health-based air quality standards are tightened, the introduction of cleaner technologies must keep pace. More broadly, a transition to zero- and near-zero emission technologies is necessary to meet 2023 and 2032 air quality standards and 2050 climate goals. Many of the same technologies will address air quality, climate and energy goals. As such, strategies developed for air quality and climate change planning should be coordinated to make the most efficient use of limited resources and the time needed to develop cleaner technologies.

2007 Air Quality Management Plan

(The following paragraphs are excerpts from the Executive Summary of the 2007 Air Quality Management Plan adopted by the SCAQMD June 1, 2007)

The SCAQMD adopted (June 1, 2007) the 2007 Air Quality Management Plan (AQMP) primarily in response to changes in the federal Clean Air Act (CAA). The CAA requires an 8-hour ozone non-attainment area to prepare a State Implementation Plan (SIP) revision by June of 2007 (which has been completed) and a PM2.5 non-attainment area to submit a SIP revision by late 2007 (which has been completed). The SCAQMD has decided that it is most prudent to prepare a single comprehensive and integrated SIP revision that satisfies both the ozone and PM2.5 requirements. Additionally, the U.S.EPA requires that transportation conformity budgets be established based on the most recent planning assumptions and approved motor vehicle emission model. The AQMP is based on assumptions provided by both the California Air Resources Board (CARB) and the Southern California Association of Governments (SCAG) reflecting their upcoming model (EMFAC) for motor vehicle emissions and demographic updates.

The AQMP relies on a comprehensive and integrated control approach to achieve the PM2.5 standard by 2015 through implementation of short-term and midterm control measures and achieve the 8-hour ozone standard by 2021/2024 based on implementation of additional long-term measures. In order to demonstrate attainment by the prescribed deadlines, emission reductions needed for attainment must be in place by 2014 and 2020/2023 timeframe.

The AQMP control measures consist of four components: 1) the District's Stationary and Mobile Source Control Measures; 2) CARB's Proposed State Strategy; 3) District Staff's Proposed Policy Options to Supplement VARB's Control Strategy; and 4) Regional Transportation Strategy and Control Measures provided by SCAG.

In order to achieve necessary reductions for meeting air quality standards, all four agencies (i.e., SCAQMD, ARB, U.S. EPA, and SCAG) would have to aggressively develop and implement control strategies through their respective plans, regulations, and alternative approaches for pollution sources within their primary jurisdiction. Even though SCAG does not have direct authority over mobile source emissions, it will commit to the emission reductions associated with implementation of the 2004 Regional Transportation Plan and 2006 Regional Transportation Improvement Program which are imbedded in the emission projections. Similarly, the Ports of Los Angeles and Long Beach have authority they must utilize to assist in the implementation of various strategies if the region is to attain clean air by federal deadlines.

Although the SCAQMD has completely met its obligations under the 2003 AQMP and stationary sources subject to the District's jurisdiction account for only 12% of NOx and 37% of SOx emissions in the Basin in 2014, the AQMP contains several short-term and mid-term control measures aimed at achieving further NOx and SOx reductions (as well as VOC and PM2.5 reductions) from these already regulated sources. These strategies are based on facility modernization, energy conservation measures and more stringent requirements for existing equipment (e.g., space heaters, ovens, dryers, furnaces).

Clean air for this region requires CARB to aggressively pursue reductions and strategies for on-road and off-road mobile sources and consumer products. In addition, considering the significant contribution of federal sources such as marine vessels, locomotives, and aircraft in the Basin (i.e., 72% of SOx and 34% of NOx), it is imperative that the U.S. EPA pursue and develop regulations for new and existing federal sources to ensure that these sources contribute their fair share of reductions toward attainment of the federal standards. Unfortunately, regulation of these emission sources has not kept pace with other source categories and as a result, these sources are projected to represent a significant and growing portion of emissions in the Basin. Without a collaborative and serious effort among all agencies, attainment of the federal standards would be seriously jeopardized.

Final Socioeconomic Report for the Final 2012 AQMP

(The following are excerpts from the Final Socioeconomic Report for the Final 2012 AQMP adopted by the SCAQMD December, 2012)

The 2012 AQMP has been prepared to meet the challenge of achieving healthful air quality in the South Coast Air Basin (Basin) and the Coachella Valley. This report accompanies the 2012 AQMP and presents the potential socioeconomic impacts resulting from implementation of this Plan. The information contained herein is considered by the South Coast Air Quality Management District (District) Governing Board when taking action on the Plan.

The 2012 AQMP control strategy is comprised of a traditional command-and-control approach, voluntary/incentive programs, and advanced technologies. Short- and near-term control strategies are proposed and will be implemented by the District, local and regional governments (e.g., transportation control measures provided in the 2012 Regional Transportation Plan), and the California Air Resources Board (CARB). These strategies include basin-wide short-term PM2.5 measures, episodic control measures for high PM2.5 days, measures to partially implement the Section 182(e)(5) commitment in the 2007 ozone SIP toward meeting the 8-hour ozone standard by 2024, and transportation control measures (TCM) adopted by the Southern California Association of Governments (SCAG). Many of the measures require behavioral changes and voluntary participation through outreach, incentive, and education. Implementation of these control strategies has potential effects on the region's economy.

The District relies on a number of methods, tools, and data sources to assess the impact of proposed control strategies on the economy. The involved applications include: integration of air quality data and concentration-response relationships to estimate benefits of clean air; capital, operating and maintenance expenditures on control devices and emission reductions to assess the cost of the Plan; and REMI (Regional Economic Models, Inc.) model to assess potential employment and other socioeconomic impacts (e.g., population and competitiveness).

Over the years, there has been an overall trend of steady improvement in air quality in the Basin. Additional emission reductions are still needed in order to bring the Basin into compliance with the federal 24-hour PM2.5 standard. Complying with the air quality standard would allow the District to avoid potential sanctions that could increase offset ratios for major sources and result in suspension of highway transportation funding. The benefits of better air quality through implementation of the 2012 AQMP include reductions in morbidity and mortality, visibility improvements, reduced expenditures on refurbishing building surfaces, and reduced traffic congestion.

The Draft 2012 Plan is projected to comply with the federal PM2.5 standard with an average annual benefit of $10.7 billion between 2014 and 2035. The $10.7 billion includes approximately $7.7 billion for congestion relief for all TCMs in the 2012 RTP, $2.2 billion for averted illness and higher survival rates, $696 million for visibility improvements, and $14 million for reduced damage to materials.

The analysis contained herein estimates that the benefits for the Plan significantly outweigh the anticipated costs. The measurement of clean air benefits is performed indirectly since clean air is not a commodity purchased or sold in a market. This often results in incomplete and underestimated benefits. The benefits of clean air (based on the total emission reductions required for attainment) for which a monetary figure can be applied are estimated to be $10.7 billion (including congestion relief benefits for all the TCMs) as compared to the estimated costs of $448 million on an average annual basis. There are, however, many benefits which are still unaccounted for, such as reductions in chronic illness and lung function impairment in human beings, reduced damage to livestock and plant life, erosion of building materials, and the value of reduced vehicle hours traveled for personal trips.

The Plan is designed to bring northwest Riverside (the Mira Loma area), the only area in exceedance of the federal PM2.5 standard, into attainment. However, PM2.5 air quality benefits occur throughout the Basin. The San Fernando Valley, southern Los Angeles County, and the northwest Riverside County would experience the highest shares of air quality benefits. The western portions of Los Angeles and Orange Counties and the eastern and northern portions of San Bernardino County are projected to have the highest shares of health benefits.

Implementation of PM2.5 and ozone measures would impose costs on various communities. The sub-regions with the highest costs are the central, southeast, and San Fernando areas of Los Angeles County. These three areas are projected to have the highest cost shares from SCAG TCMs and relative higher cost shares from ozone measures.

All sub-regions are projected to have additional jobs created from cleaner air. The eastern, southern, and San Fernando sub-regions in Los Angeles County and Riverside County are projected to have more jobs created than other sub-regions resulting from clean air benefits. Implementation of quantified control measures would result in jobs forgone between 2013 and 2035. Orange County is projected to have the highest share of jobs forgone from implementation of control measures. This is because the majority of SCAG transportation control measures (TCM) in Orange County would be financed by development fees, which would have a heavy burden on one single sector of the *economy—the construction sector. For the entire Plan, all sub-regions would show positive job impacts as the four-county area becomes more competitive and attractive with the progress in clean air.*

Job gains from cleaner air would benefit all wage groups. Conversely, all five groups would experience jobs forgone from control measures. However, there is no significant difference in impacts expected for high- versus low-paying jobs. The same is observed for impacts on the price of consumption goods from one income group to another. These findings will be further evaluated during individual rule development.

State of California SIP for the new federal PM2.5 and 8-hour ozone standards (adopted June 20, 2011)

On April 28, 2011, the Air Resources Board considered revisions to the South Coast (and San Joaquin Valley) State Implementation Plans (SIPs) for PM2.5 that accounted for reductions of emissions that contribute to PM2.5 levels. The revisions were formally adopted by the ARB's Executive Officer on May 18, 2011, when Executive Order S-11-010 was signed. The April 2011 PM2.5 SIP Revisions accounted for recent regulatory actions and recessionary impacts on emissions that occurred after the South Coast (and San Joaquin Valley) PM2.5 SIPs were adopted. Those revisions accounted for the impact the recession has had on emissions and the benefits of ARB's in-use diesel truck and off-road equipment regulations. The revisions updated the PM2.5 SIP's reasonable further progress calculations, transportation conformity budgets, and ARB's rulemaking calendar.

Localized Cumulative Impacts

The proposed project and other reasonably foreseeable projects could cause impacts that would be locally combined and future projects would introduce stationary sources that are not included in the "background" conditions. Reasonably foreseeable future projects are those that are either currently under construction or in the process of being approved by a local air district or municipality. Projects that have not yet entered the approval process do not normally qualify as "foreseeable" since the detailed information needed to conduct this analysis is not available. Sources that are presently operational are included in the background concentrations. Background conditions also take into account the effects of non-stationary sources.

Projects with stationary sources located up to six miles from the proposed project site usually need to be considered by the cumulative analysis. HBEP requested that the SCAQMD identify potential new stationary sources within six miles of the HBEP site. The SCAQMD provided emission inventory and the list of new projects near the HBEP. Based on the detailed permit application data received from SCAQMD, additional facilities were removed from the cumulative assessment if the applications were adinistrative changes only, the permitted sources did not result in an increase in emissions, the emissions increase were less than significatnt (less than a 5 ton increase), or the location of the permitted source was beyond 6 miles from HBEP. In addition to the HBEP, there are three sources included in the cumulative analysis:

- Orange County Sanitation District (Facility ID 17301) located in Fountain Valley, CA with five emission sources;

- Orange County Sanitation District (Facility ID 29110) located in Huntington Beach, CA with seven emission sources;
- Arion Graphics, LLC (Facility ID 167066) containg one recuperative thermal oxidizer (RTO)

The maximum modeled cumulative impacts are presented below in **Air Quality Table 20**. The total impact is conservatively estimated by the maximum modeled impact plus existing maximum background pollutant levels.

Air Quality Table 20 shows that HBEP, along with three other existing sources, would not cause new exceedances for PM2.5, CO, NO_2, and SO_2. However, PM10 emissions from HBEP would be cumulatively considerable because they would contribute to the existing violations of annual PM10 ambient air quality standards. The HBEP would mitigate emissions through the use of district required best available control technology (BACT) and offset provided by the SCAQMD. Therefore, the cumulative operating impacts after mitigation are considered to be less than significant.

Air Quality Table 20
HBEP, Ambient Air Quality Impacts from Cumulative Sources (µg/m^3)

Pollutant	Averaging Time	Modeled Impact	Background	Total	Limiting Standard	Percent of Standard
PM10	24 hour	4.73	45	49.73	50	99
	Annual	**0.28**	**24.2**	**24.48**	**20**	**122**
PM2.5	24 hour[a]	4.73	28.3	33.03	35	94
	Annual	0.28	11.0	11.28	12	94
CO	1 hour	328	3,450	3,778	23,000	16
	8 hour	78.4	2,444	2,522.4	10,000	25
NO_2 [b]	State 1 hour	58.6	139	197.6	339	58
	Federal 1 hour[c]			148	188	79
	Annual	0.73	21	21.73	57	38
SO_2	State 1 hour	4.95	26	30.95	655	5
	Federal 1 hour[d]	4.95	13	17.95	196	9
	24 hour	1.22	5	6.22	105	6

Source: HBEP 2013kk with independent staff analysis.
[a] Total predicted concentration for the federal 24-hour PM2.5 standard is the maximum modeled concentration combined with the 3-year average of 98th percentile background concentrations.
[b] The maximum 1-hour and annual NO_2 concentrations include ambient NO_2 ratios of 0.80 and 0.75 respectively.
[c] Total predicted concentration for the federal 1-hour NO_2 standard is the maximum modeled concentration paired with the 3-year average of 98th percentile seasonal hourly background concentrations.
[d] Total predicted concentration for the federal 1-hour SO_2 standard is the maximum modeled concentration combined with the 3-year average of 99th percentile background concentrations.

Since HBEP is subject to prevention of significant deterioration (PSD) review for NO_2, SO_2, CO and PM10, the project impacts must be below the PSD Significant Impact Levels (SILs) and applicable preconstruction monitoring thresholds for these pollutants or an increments analysis and/or preconstruction monitoring may be required. The PM, SO_2, CO, and annual NO_2 impacts from the new units shown in **Air Quality Table 14** are all below corresponding SILs levels. However, the maximum 1-hour NO_2 impacts would exceed the applicable NO_2 SIL (7.5 µg/m^3), so an increments analysis is required for NO_2 impacts. The SCAQMD and EPA identified three sources to include in the 1-hour NO_2 cumulative analysis:

- Orange County Sanitation District (Facility ID 17301) located in Fountain Valley, CA with five emission sources;
- Orange County Sanitation District (Facility ID 29110) located in Huntington Beach, CA with seven emission sources;
- Beta Offshore (Facility ID 166903): located in Huntington Beach, CA with 21 emisson sources

In addition to the above facilities, emissions from shipping lane activities off the California coast are also included in the 1-hour NO_2 cumulative assessment. **Air Quality Table 21** shows the maximum 1-hour NO_2 impact from these cumulative sources. As shown in **Air Quality Table 21,** HBEP cumulative sources would not cause new exceedances of the federal 1-hour NO_2 standard. Therefore, no additional PSD analysis is necessary.

The project's peak 24-hour impact is 4.7 ug/m^3, which is less than the Class II SIL of 5 ug/m3; therefore no additional PSD analysis is necessary.

AIR QUALITY Table 21
Maximum 1-hour NO_2 Impacts from Cumulative Sources (μg/m^3)

Pollutant	Averaging Time	Total Impact [a]	Limiting Standard	Percent of Standard
NO_2	1 hour (federal)	168.2	188	89

Source: SCAQMD 2014a.
Note:
[a]Total predicted concentration for the federal 1-hour NO_2 standard is the maximum modeled concentration paried with the 3-year average of 98th percentile seasonal hour-of-day background concentrations.

COMPLIANCE WITH LORS

The revised Preliminary Determination of Compliance (PDOC) for HBEP was released and dated April 11, 2014 (SCAQMD 2014a). Compliance with all district Rules and Regulations was demonstrated to the district's satisfaction in the revised PDOC, and the revised PDOC conditions are presented in the Conditions of Certification located near the end of this section. At the time of this analysis, SCAQMD's Final Determination of Compliance (FDOC) is not available. Therefore the conditions of certification are subject to change upon the release of FDOC.

FEDERAL

40 CFR 51, Nonattainment New Source Review. The revised PDOC includes conditions that would implement the federal nonattainment New Source Review (NSR) permit for HBEP.

40 CFR 52, Prevention of Significant Deterioration. The HBEP project is subject to permit requirements under the Prevention of Significant Deterioration (PSD) program, which is administered by the SCAQMD. The facility owner submitted the PSD application to the SCAQMD on June 26, 2012.

40 CFR 60 Subpart Da, NSPS for Steam Generators. The fired HRSGs are subject to this subpart because their heat input rating is 507 mmbtu/hr which is greater than the applicability standard of 250 mmbtu/hr in the rule. The emission standards that apply are: NOx 0.2 lbs/mmbtu, PM 0.015 lbs/mmbtu, SO_2 0.2 lbs/mmbtu. Anticipated emissions from the gas turbines/duct burners are: NOx 0.0081 lbs/mmbtu, PM 0.0050 lbs/mmbtu, SO_2 0.0015 lbs/mmbtu. The emissions estimates are all lower than subpart Da requirements. Compliance is expected.

40 CFR 60 Subpart KKKK, NSPS for Stationary Gas Turbines. The turbines are subject to Subpart KKKK because their heat input is greater than 10.7 gigajoules per hour (10 MMBtu per hour) at peak load, based on the higher heating value of the fuel fired. Actual unit rating is 1498E+06 btu/hr (HHV) X 1055 joules/btu = 1580.4 gigajoules/hr. The standards applicable for a natural gas turbine greater than 850 mmbtu/hr are: NOx 15 ppm at 15 percent O_2 (0.43 lbs/MWh), SOx: 0.90 lbs/MWh discharge, or 0.060 lbs/mmbtu potential SO2 in the fuel. In addition, this regulation requires that the fuel consumption and water to fuel ratio be monitored and recorded on a continuous basis, or alternatively, that a NOx and O_2 CEMS be installed. For the SOx requirement, either a fuel meter to measure input, or a watt-meter to measure output is required, depending on which limit is selected. Also, daily monitoring of the sulfur content of the fuel is required if the fuel limit is selected. However, if the operator can provide supplier data showing the sulfur content of the fuel is less than 20 grains/100cf (for natural gas), then daily fuel monitoring is not required. An initial performance test is required for both NOx and SO_2. For units with a NOx CEMS, a minimum of 9 RATA reference method runs is required at an operating load of +/- 25 percent to 100 percent of load. For SO_2, either a fuel sample methodology or a stack measurement can be used, depending on the chosen limit. Annual performance tests are also required for NOx and SO_2. Compliance with the requirements of this rule is expected.

40 CFR Part 64, Compliance Assurance Monitoring (CAM). The CAM regulation applies to emission units at major stationary sources required to obtain a Title V permit, which use control equipment to achieve a specified emission limit and which have emissions that are at least 100 percent of the major source thresholds on a pre-control basis. The HBEP is a major source and the turbine emissions are greater than the major source thresholds for NOx, CO, VOC, and PM10, and the turbines will be subject to an emission limit for each of these pollutants. Control systems are used for NOx, CO, and VOC, but not PM10.

NOx is subject to a 2.0 ppm, one-hour BACT limit and is controlled with the selective catalytic reduction system. As a NOx Major Source under Reclaim, the turbines are required to have CEMS under Rule 2012. The use of a continuous monitor to show compliance with an emission limit is exempt from CAM requirements under 64.2(b)(vi).

CO is subject to a 2.0 ppm, one-hour BACT limit and is controlled with the oxidation catalyst. The turbines will be required to use a CO CEMS under Rule 218. The use of a continuous monitor to show compliance with an emission limit is exempt from CAM requirements under 64.2(b)(vi).

VOC is subject to a 2.0 ppm, one-hour BACT limit and is controlled with the oxidation catalyst. The oxidation catalyst is effective at operating temperatures above 500°F. The facility is required to maintain a temperature gauge in the exhaust, which will measure the exhaust temperature on a continuous basis and record the readings on an hourly basis. The exhaust temperature is required to be at least 500°F, (with exceptions for start ups and shutdowns). This will ensure that the oxidation catalyst is operating properly. Compliance is expected.

40 CFR Part 72, Acid Rain Provisions. The HBEP will be subject to the requirements of the federal acid rain program, because the turbines are utility units greater than 25 MW. The acid rain program is similar to RECLAIM in that facilities are required to cover SO_2 emissions with "SO_2 allowances" that are similar in concept to RTCs. The HBEP was given initial allowance allocations based on the past operation of their boilers. AES can either use those allocations, or if insufficient, must purchase additional allocations to cover the operation of the new turbines. The applicant is also required to monitor SO_2 emissions through use of fuel gas meters and gas constituent analyses, or, if fired with pipeline quality natural gas, as in the case of the HBEP, a default emission factor of 0.0006 lbs/mmbtu is allowed. SO_2 mass emissions are to be recorded every hour. NOx and O_2 must be monitored with CEMS in accordance with the specifications of Part 75. Under this program, NOx and SOx emissions will be reported directly to the U.S. EPA. Part 75 requires that the CEMS be installed and certified within 90 days of initial startup. Compliance is expected.

STATE

HBEP has demonstrated that the project would comply with Section 41700 of the California State Health and Safety Code, which restricts emissions that would cause nuisance or injury. Conditions required in the SCAQMD's revised preliminary determination of compliance (revised PDOC, SCAQMD 2014a) and the Energy Commission staff's Conditions of Certification enable staff's affirmative finding.

LOCAL

The applicant provided an air quality permit application to the SCAQMD and the district has issued a revised PDOC (SCAQMD 2014a), which states that the proposed project is expected to comply with all applicable district rules and regulations. The SCAQMD will also issue a final determination of compliance (FDOC) after considering comments submitted during the comment period.

The district rules and regulations specify the emissions control and offset requirements for new sources such as the HBEP. Best Available Control Technology would be implemented, and RECLAIM trading credits (RTCs) for NOx and SOx emissions are required by district rules and regulations based on the permitted emission levels for this project. Compliance with the district's new source requirements would ensure that the project would be consistent with the strategies and future emissions anticipated under the district's air quality attainment and maintenance plans.

As part of the Energy Commission's licensing process, in lieu of issuing a construction permit to the applicant for the HBEP, the district has prepared and presented to the Energy Commission the revised PDOC, and will issue the FDOC after a public comment period. The DOCs evaluate whether and under what conditions the proposed project would comply with the district's applicable rules and regulations, as described below.

Compliance with specific SCAQMD rules and regulations is discussed below via excerpts from the revised PDOC (SCAQMD 2014a). For a more detailed discussion of the compliance of the proposed facility modifications, please refer to the revised PDOC (SCAQMD 2014a).

Regulation II – Permits

RULE 212 – Standards for Approving Permits. This project is subject to Rule 212 public notice requirements because the daily maximum VOC, CO, NOx, and PM10 emissions from the project will all exceed the emissions thresholds specified in subdivision (g) of this rule. The District has prepared a public notice which contains sufficient information to fully describe the project. In accordance with subdivision (d) of this rule, the applicant will be required to distribute the public notice to each address within ¼ mile radius of the project.

RULE 218 – Continuous Emission Monitoring System (CEMS). In order to ensure the equipment meets the CO BACT limit as specified in the permit, a CO CEMS will be required by permit condition. The CO CEMS must be certified in accordance with Rule 218. The rule requires submittal of an "Application for CEMS" for approval. Once approved, CEMS data must be recorded and records of the data must be maintained on site for at least 2 years. Additionally, every 6 months a summary of the CEMS data must be submitted to SCAQMD. AQMD. Any CEMS breakdowns must also be reported. Compliance with this rule is expected.

Regulation IV – Prohibitions

RULE 401 – Visible Emissions. This rule limits visible emissions to an opacity of less than 20 percent (Ringlemann No.1), as published by the United States Bureau of Mines. Visible emissions are not expected during normal operation from the turbines or ammonia tank.

RULE 402 – Nuisance. This rule requires that a person not discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or which cause, or have a natural tendency to cause injury or damage to business or property. The turbines and ammonia tank are not expected to create nuisance problems under normal operating conditions.

RULE 403 – Fugitive Dust. The provisions of this rule apply to any activity or man-made condition capable of generating fugitive dust. This rule prohibits emissions of fugitive dust beyond the property line of the emission source. The applicant will be taking steps to prevent and/or reduce or mitigate fugitive dust emissions from the project site. In addition, the applicant will need to implement all Best Available Control Measures listed in Table 1 of the rule. The installation and operation of the turbines and associated equipment is expected to comply with this rule.

RULE 407 – Liquid and Gaseous Air Contaminants. This rule limits CO emissions to 2000 ppmv. The CO emissions from the turbines will be controlled by an oxidation catalyst to 2.0 ppmvd at 15 percent O_2. Therefore, compliance with this rule is expected.

RULE 409 – Combustion Contaminants. This rule restricts the discharge of contaminants from the combustion of fuel to 0.23 grams per cubic meter (0.1 grain per cubic foot) of gas, calculated to 12 percent CO_2, averaged over 15 minutes. The turbines have a grain loading of 0.003 grains per standard cubic foot (gr/scf) at the maximum firing load and therefore are expected to meet this limit. Compliance will be verified through the initial performance test.

RULE 431.1 – Sulfur Content of Gaseous Fuels. The natural gas supplied to the turbines is expected to comply with the 16 ppmv sulfur limit (calculated as H_2S) specified in this rule. Commercial grade natural gas has an average sulfur content of about 4 ppm. The long term (annual) SOx emissions from the turbines are based on 4 ppm or about 0.25 grains per 100 cubic feet concentration (gr/100 cf). The short term (hourly, daily, and monthly) SOx emissions from the turbines are based on 12 ppm or about 0.75 gr/100 cf. The applicant will also comply with reporting and record keeping requirements as outlined in subdivision (e) of this rule.

RULE 475 – Electric Power Generating Equipment. This rule applies to power generating equipment greater than 10 MW installed after May 7, 1976. Requirements are that the equipment meets a limit for combustion contaminants of 11 lbs/hr or 0.01gr/scf. Compliance is achieved if either the mass limit or the concentration limit is met. Mass PM10 emissions from each turbine are estimated at 9.5 lbs/hr, and 0.0033 gr/scf during natural gas firing at maximum firing load. Therefore, compliance is expected. Compliance will be verified through the initial performance test as well as ongoing periodic testing.

REGULATION XIII – New Source Review (NSR).

The new turbines are subject to NSR, including BACT, modeling, and offsets. Also, the addition of the turbines to the HBEP is considered a major modification to an existing major source. Therefore, the additional requirements for major sources are applicable.

Best Available Control Technology (BACT)

BACT is required for all criteria pollutants. For major sources, BACT is determined at the time the permit is issued, SCAQMD has determined that BACT for combined cycle gas turbines is: NOx 2.0 ppmdv @ 15 percent O_2, one hour average, CO 2.0 ppmdv @ 15 percent O_2, one hour average, VOC 2.0 ppmdv @ 15 percent O_2, one hour average, PM10 Natural gas fuel, SOx Natural gas fuel with fuel sulfur content of no more than one grain/100 scf (about 16 ppm), NH_3 5.0 ppmdv @ 15 percent O_2, one hour average. Compliance is verified in the DOC.

Modeling

The applicant performed dispersion modeling for NO_2, CO, SO_2, and PM. Modeling evaluations were performed using the American Meteorological Society/USEPA AERMOD (version 12345) model and representative meteorological data from the John Wayne Airport meteorological station. Modeling analysis was performed for turbine startups, normal turbine operation, and turbine commissioning operations.

The compliance determination for NO_2, CO, SO_2, and PM is a comparison of the project impact plus the background concentration to show that the sum does not exceed the ambient air quality standard. The results of the model show that the project will not cause an exceedance, or make significantly worse an existing violation, of any state or national ambient air quality standard.

Offsets

The applicant is requesting that the project be evaluated under the Rule 1304(a)(2) – Electric Utility Steam Boiler Replacement exemption. This provision applies to the replacement of a utility steam boiler with combined cycle gas turbine(s), or several other cleaner generation technologies, and allows an exemption from modeling and offsets for non-RECLAIM pollutants in such cases. The exemption applies on a MW to MW basis. Its purpose is to facilitate the removal of older, less efficient boiler/steam turbine technology with newer, cleaner gas turbine technology at the utilities, in conjunction with Rule 1135. Since the advent of RECLAIM, the exemption was expanded to include modifications being conducted in order to comply with Regulation XX rules. Rule 2005 (described below) does not provide a similar exemption for NOx.

In order to qualify for the Rule 1304(a)(2) exemption, the applicant is proposing to shutdown four boilers in conjunction with the construction of the new HBEP. Those four boilers include Boilers 1 and 2 at the Huntington Beach site, as well as Boilers 6 and 8 at AES' Redondo Beach Generating Facility. The total capacity of the boilers being shutdown is 1,085 MWs. The capacity of the new units is 939 MWs net. The plant would be limited to this net MW output by Condition of Certification AQ-14.

Under Rule 2005, RTCs to cover the expected emissions of NOx are required to be held for the first compliance year. Additionally, since the NOx potential to emit (PTE) after the commissioning year is greater than the facility's initial allocation, the facility is required to hold NOx RTCs for each subsequent year. The Huntington Beach facility is also in the SOx RECLAIM program. Therefore, SOx RTCs are required to be held to cover the first year of operation. Additionally, because the facility opted into SOx RECLAIM after 1994, there is no initial allocation. For this reason, SOx RTCs are required to be held for each compliance year after the first year of operation [paragraph (f)(1)].

Other requirements of Rule 1303:

Sensitive Zone Requirements. For this project, ERCs may be obtained from either Zone 1 or Zone 2A.

Facility Compliance. This facility is currently in compliance with all applicable rules and regulations of the District.

Alternative Analysis. The project is subject to the California Energy Commission licensing procedure. Under this procedure, a full analysis of the proposal is conducted, including project alternatives. Please refer the Alternative section of staff assessment for details.

Protection of Visibility. Net Increase in emissions from the proposed project exceed the 15 tons per year PM10 and 40 tons per year NOx thresholds, but the site is not within the specified distance of any Class I areas. However, a visibility analysis was conducted under the prevention of significant deterioration (PSD) regulation.

Statewide Compliance. The applicant has submitted a statement certifying that all AES's stationary sources are currently in compliance with applicable state and federal environmental regulations.

Rule 1304.1 – Electrical Generating Facility Fee for Use of Offset Exemption. The project would utilize the offset exemption of Rule 1304(a)(2) for PM10 and VOC, and is therefore subject to a fee under this rule. The facility has opted to pay an annual fee. The facility would be required to demonstrate compliance with the specific requirements of this rule prior to issuance of Permits to Construct for the HBEP.

RULE 1325 – Federal PM2.5 New Source Review. This rule applies to major polluting facilities, which have actual emissions, or a potential to emit of greater than 100 tons per year. A major polluting facility is required to comply with the following requirements: 1) use lowest achievable emissions rate (LAER), 2) offset PM2.5 emissions at the offset ratio of 1.1:1, 3) certify compliance with emission limits and 4) conduct an alternative analysis of the project. The total PM2.5 potential to emit resulting from the addition of the 6 turbines will not result in an emissions increase above the 100 ton/year threshold. Therefore, the HBEP will continue to be a non-major polluting facility for PM2.5 and would not be subject to these requirements.

REGULATION XVII – Prevention of Significant Deterioration (PSD).

The South Coast Basin where the project would be located is in attainment for NO_2, SO_2, CO, and PM10 emissions. Additionally, beginning on January 2, 2011, Greenhouse Gases (GHGs) are a regulated pollutant under the PSD major source permitting program. Therefore each of these pollutants must be evaluated under PSD requirements for this project.

The applicant performed modeling which indicated that the maximum 1-hour and 8-hour CO impacts from turbine operations are below the corresponding US EPA CO Class II SILs. Therefore, 1-hour and 8-hour CO increment analyses are not required. The peak annual NO_2 impact from the total project is less than the US EPA NO_2 Class II significance impact level, therefore, no additional PSD analysis is necessary.

For 1-hour NO_2 impacts, it was determined that the peak impact level from the proposed project exceeds the significance impact level of 7.52 ug/m^3. Therefore, a cumulative impact assessment is necessary. For the cumulative impact assessment, three facilities, Orange County Sanitation District's Huntington Beach and Fountain Valley facilities and Beta Offshore as well as emissions from shipping lane activities off the coast were selected to be included based on their facility emissions and distance to the project. Seasonal, by hour-of-day background concentrations from the Costa Mesa monitoring station were used in the modeling. Following the form of the standard, the 1-hour NO_2 impact from the project plus cumulative sources plus background is 168.2 ug/m^3, which is less than the federal 1-hour standard of 188 ug/m^3. Therefore, no additional PSD analysis is necessary.

Effective July 26, 2013, the South Coast Air Basin has been re-designated to attainment for the 24-hour PM10 NAAQS, making PSD considerations applicable for this pollutant. The project's total peak 24-hour impact is 4.74 ug/m^3, which is less than the Class II significant impact level (SIL) of 5 ug/m^3, therefore no additional PSD analysis is necessary.

Regulation XX – Regional Clean Air Incentives Market (RECLAIM)

Rule 2011 – SOx RECLAIM, Monitoring Recording and Recordkeeping Requirements. The turbines will be classified as process units under SOx RECLAIM. As such they are required to measure and record fuel use and calculate mass SOx emissions using the emission factor on the permit, and electronically report emissions on a quarterly basis.

Rule 2012 – NOx RECLAIM, Monitoring Recording and Recordkeeping Requirements. The turbines will be classified as major NOx sources under NOx RECLAIM. As such, they are required to measure and record NOx concentrations and calculate mass NOx emissions with a Continuous Emissions Monitoring System (CEMS). The CEMS would include in-stack NOx and O2 analyzers, a fuel meter, and a data recording and handling system. NOx emissions are to be reported to SCAQMD on a daily basis. The CEMS system would be required to be installed within 90 days of start up. Compliance is expected.

REGULATION XXX – Title V

The existing Huntington Beach facility is currently subject to Title V requirements, and is operating under a valid Title V permit issued on May 4, 2011. The addition of the combined-cycle plant would be considered a significant revision to the existing Title V permit. AES has submitted a Title V revision application A/N 540259. As a significant revision, the permit is subject to a 30-day public notice and a 45-day EPA review and comment period, which is expected to conclude by late May 2014.

RESPONSES TO COMMENTS

After the publication of the Preliminary Staff Assessment, staff received comments from the applicant only. All their comments have been considered and many have been incorporated in this Final Staff Assessment. Those comments not accepted by staff are included below, including explanation of why they were not accepted.

1. **Applicant:** Change ppm values in Air Quality Tables 4 and 5 to micrograms per cubic meter.

   Staff: Staff chose to keep ppm units because the sources for these data are expressed in these units.

2. **Applicant:** Report the 1-hour SO_2 level as 19 micrograms per cubic meter, not 26.

   Staff: Staff did not make this change because our computation is based on 0.01 ppm, not the 0.0095 ppm value indicated by the applicant. However, neither value results in a significant issue for this project.

3. **Applicant:** Construction emissions impacts should be based on SCAQMD significance thresholds.

   Staff: Staff contends that emissions increases in an area that exceeds health-based ambient air quality standards are significant under CEQA and must be mitigated.

4. **Applicant:** Staff should consider the offset fees paid under Rule 1304.1 as construction mitigation measures.

   Staff: Rule 1304.1 fees paid may not be used to generate air quality benefits in the vicinity of the project nor in the time fame associated with HBEP construction.

5. **Applicant:** Our NO_2 impacts (Values submitted by the applicant in TN #200949) differ from values used by SCAQMD and Energy Commission staff (Values in revised PDOC).

   Staff: Staff believes that these differences do not materially affect the analysis or result in any different conclusions. Staff used district values for consistency.

On May 5th, 2014, Monica Rudman filed comments on the SCAQMD's Revised Preliminary Determination of Compliance (TN 202291). Although these comments are not directed to the Preliminary Staff Assessment, staff responds below to the air quality comments related to this staff analysis in order for the public to better understand staff's analysis:

6. **Rudman:** In general, the revised Preliminary Determination of Compliance (PDOC) is very technical and difficult for anyone who is not an air quality expert to follow.

   Staff: Air quality staff analysis is also technical in nature and similar to the revised PDOC. However, staff has attempted to include more narrative, with detailed explanations and notes for the technical terms, assumptions, calculations and LORS. This is intended to assist the public to better understand the air quality impacts and mitigation of the proposed project.

7. **Rudman:** The new power project in Huntington Beach would results in a massive increase in (PM) emissions… The determination of compliance should explain how and why this exchange would result in the same air quality for the residents of Huntington Beach and all people living within 6 miles of the proposed HBEP.

   Staff: Staff believe

8. **Rudman:** Harmful Particulate Pollution

   Staff: Staff believes that the HBEP would qualify for the SCAQMD Rule 1304 (a)(2) exemption. Therefore, PM10 and PM2.5 emissions of the new gas turbines would be fully offset with credits from SCAQMD's internal bank. In addition, HBEP would also pay electrical generating fees under Rule 1304.1 in order to use the offset exemption. The fees would be used to fund air quality improvement projects consistent with SCAQMD's Air Quality Management Plan, with a priority for air quality improvement projects located in communities surrounding the HBEP site; however, the timing of the air quality improvement projects is uncertain.

9. **Rudman:** The air quality modeling uses weather data from the station near John Wayne (Santa Ana) Airport. However, the weather there is not similar enough to weather conditions in Huntington Beach to be accurate.

   Staff: The operating monitoring station closest to the proposed site is North Coastal Orange County (Costa Mesa) station. However, the data from the John Wayne Airport station is chosen for air quality modeling inputs because of the following factors: 1) surface characteristics at John Wayne Airport are more similar to the project site, 2) John Wayne Airport data are more current, 3) John Wayne Airport has fewer missing data and 4) the Costa Mesa data provide inconsistent results because of a high incidence of reported calm wind conditions, with the clam winds percentage varying from 0 percent to 38 percent depending on the data processing method used.

10. **Rudman:** The assessment should evaluate the impacts on the Class II location across the street from the proposed project: Huntington State Beach.

Staff: As Ms. Rudman states, the PSD analysis conducted by SCAQMD includes visibility assessments on state parks and staff agrees the assessment is complete to the degree required by PSD requirements. Impacts in the more immediate vicinity of the proposed facility would be less than at the state parks due to the time needed for the gas-to-particle conversions that affect visibility.

11. **Rudman:** This (project heat rate) is higher than the current electricity system average heat rate and will be setting back the progress that California has been making to reduce greenhouse gases from the electricity system and is contrary to California law.

    Staff: Staff agrees that GHG emission rate and thermal efficiency are interrelated. The operation of HBEP would balance thermal efficiency and facility flexibility indicated by its design as a multi-stage power generating facility and its operation in a high renewable / low GHG electricity system. HBEP would be designed and operated to achieve more flexibility to meet the electrical needs of a wind and solar renewable system.

PROPOSED FINDINGS

Based on the staff's analysis, we recommend the following findings:

1. The HBEP would be located in the South Coast Air Basin and within the South Coast Air Quality Management District.

2. The area where HBEP would be located is designated as nonattainment for both state and federal ozone and PM2.5 standards, attainment for federal PM10 and nonattainment for state PM10 standards, and attainment for both state and federal CO, NO_2 and SO_2 standards.

3. The project construction impacts would contribute to violations of the ozone, PM10, and PM2.5 ambient air quality standards. Staff recommends Conditions of Certification **AQ-SC1** to **AQ-SC6** to mitigate the construction-phase impacts of the proposed project.

4. The project operation would neither cause new violations of CO, NO_2, SO_2 and PM2.5 ambient air quality standards nor contribute to existing violations for these pollutants. Therefore, the project's direct CO, NO_2, SO_2 and PM2.5 impacts are less than significant.

5. The project's NOx and VOC emissions would contribute to existing violations of state and federal ozone ambient air quality standards. The RECLAIM Trading Credits (RTCs) and volatile organic compound (VOC) offsets from the district's internal bank would mitigate the ozone impact to a less than significant level.

6. The project's annual PM10 emissions would contribute to the existing violation of state air quality standards. The District would offset the PM10 emissions from its internal bank to mitigate the PM10 impacts of the new gas turbines to a less than significant level. The offsets would be in sufficient quantities to satisfy Energy Commission staff's recommendation that all nonattainment pollutant and precursor emissions be offset by at least a one pound of offsets for each pound of emissions.

7. The SCAQMD has issued a revised PDOC finding that HBEP would comply with all applicable district rules and regulations for project operation. The district's revised PDOC conditions are included herein as conditions of certification **AQ-1** through **AQ-41**.

8. This analysis contains an adequate evaluation of the project's contributions to cumulative air quality impacts.

9. Implementation of the conditions of certification listed below would ensure that the HBEP will not result in any significant direct, indirect, or cumulative adverse impacts to air quality.

PROPOSED CONCLUSIONS

Staff recommends the following conclusions about the HBEP:

- Construction impacts would contribute to violations of the ozone, PM10, and PM2.5 ambient air quality standards. Staff recommends conditions of certification **AQ-SC1** to **AQ-SC6** to mitigate the project's construction-phase impacts. Due to the long construction period (90 months) and the complexity of construction activities, compliance with these conditions would be critical to reduce construction impacts.
- Operation of the project would comply with applicable SCAQMD rules and regulations, including New Source Review, Best Available Control Technology (BACT) requirements, and requirements to offset emission increases; staff recommends the inclusion of the District's revised PDOC conditions as conditions of certification **AQ-1** through **AQ-41** for the HBEP.
- Implementation of the conditions of certification, and the air quality conditions and practices described in the analysis would reduce potential adverse impacts to insignificant levels and ensure that the project's emissions are mitigated to less than significant.
- The projects' emissions would comply with all applicable laws, ordinances, regulations, and standards related to air quality as described in pertinent portions of this analysis.

PROPOSED CONDITIONS OF CERTIFICATION

AIR QUALITY Table 22 maps out the relationship between Energy Commission Condition numbering and district condition numbering and proposed modifications to each condition.

Air Quality Table 22
Mapping of Energy Commission and District Condition Numbering

Energy Commission	District	Energy Commission	District
AQ-SC1	(none)	AQ-18	D29.7
AQ-SC2	(none)	AQ-19	D82.1
AQ-SC3	(none)	AQ-20	D82.2
AQ-SC4	(none)	AQ-21	E193.3
AQ-SC5	(none)	AQ-22	E193.4
AQ-SC6	(none)	AQ-23	E193.5
AQ-SC7	(none)	AQ-24	E193.6
AQ-SC8	(none)	AQ-25	I298.1
AQ-1	F2.1	AQ-26	I298.2
AQ-2	F52.1	AQ-27	K40.3
AQ-3	F52.2	AQ-28	K67.5
AQ-4	A63.5	AQ-29	I298.3
AQ-5	A63.6	AQ-30	I298.4
AQ-6	A99.4	AQ-31	A195.9
AQ-7	A195.6	AQ-32	D12.7
AQ-8	A195.7	AQ-33	D12.8
AQ-9	A195.8	AQ-34	D12.9
AQ-10	A327.1	AQ-35	E179.4
AQ-11	B61.1	AQ-36	E179.5
AQ-12	C1.7	AQ-37	E193.4
AQ-13	C1.8	AQ-38	D12.10
AQ-14	C1.9	AQ-39	E144.1
AQ-15	C1.10	AQ-40	C157.1
AQ-16	D29.5	AQ-41	E193.4
AQ-17	D29.6		

STAFF-RECOMMENDED CONDITIONS OF CERTIFICATION

Staff proposes the following conditions of certification (identified as the **AQ-SCx** series of conditions) to provide CEQA mitigation for this project.

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

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

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

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

AQ-SC3 Construction Fugitive Dust Control: The AQCMM shall submit documentation to the CPM in each monthly compliance report (MCR) that demonstrates compliance with the Air Quality Construction Mitigation Plan (AQCMP) mitigation measures for purposes of minimizing fugitive dust emission creation from construction activities and preventing all fugitive dust plumes from leaving the project's boundary. The following fugitive dust mitigation measures shall be included in the AQCMP required by **AQ-SC2**, and any deviation from the AQCMP mitigation measures shall require prior CPM notification and approval.

A. The main access roads through the facility to the power block areas will be either paved or stabilized using soil binders, or equivalent methods, to provide a stabilized surface that is similar for the purposes of dust control to paving, that may or may not include a crushed rock (gravel or similar material with fines removed) top layer, prior to initiating construction in the main power block area, and delivery areas for operations materials (chemical, replacement parts, etc.) will be paved prior to taking initial deliveries.

B. All unpaved construction roads and unpaved operation site roads, as they are being constructed, shall be stabilized with a non-toxic soil stabilizer or soil weighting agent that can be determined to be both as efficient or more efficient for fugitive dust control as ARB approved soil stabilizers, and shall not increase any other environmental impacts including loss of vegetation to areas beyond where the soil stabilizers are being applied for dust control. All other disturbed areas in the project construction site shall be watered as frequently as necessary during grading; and after active construction activities shall be stabilized with a non-toxic soil stabilizer or soil weighting agent, or alternative approved soil stabilizing methods, in order to comply with the dust mitigation objectives of Condition of Certification **AQ-SC4**. The frequency of watering can be reduced or eliminated during periods of precipitation.

C. No vehicle shall exceed 10 miles per hour on unpaved areas within the construction site, with the exception that vehicles may travel up to 25 miles per hour on stabilized unpaved roads as long as such speeds do not create visible dust emissions.

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

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

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

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

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

I. Construction areas adjacent to any paved roadway below the grade of the surrounding construction area or otherwise directly impacted by sediment from site drainage shall be provided with sandbags or other equivalently effective measures to prevent run-off to roadways, or other similar run-off control measures as specified in the Storm Water Pollution Prevention Plan (SWPPP), only when such SWPPP measures are necessary so that the condition does not conflict with the requirements of the SWPPP.

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

K. At least the first 500 feet of any paved public roadway exiting the construction site or exiting other unpaved roads en route from the construction site or construction staging areas shall be swept as needed (less during periods of precipitation) on days when construction activity occurs or on any other day when dirt or run-off resulting from the construction site activities is visible on the public paved roadways.

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

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

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

Verification: The AQCMM shall provide the CPM a Monthly Compliance Report to include the following to demonstrate control of fugitive dust emissions:

A. a summary of all actions taken to maintain compliance with this condition;

B. Copies of any air quality-related complaints filed with the air district or facility representatives in relation to project construction; and

C. Any other documentation deemed necessary by the CPM or AQCMM to verify compliance with this condition. Such information may be provided via electronic format or disk at the project owner's discretion.

AQ-SC4 Dust Plume Response Requirement: The AQCMM or an AQCMM delegate shall monitor all construction activities for visible dust plumes. Observations of visible dust plumes that have the potential to be transported off the project site and within 400 feet upwind of any regularly occupied structures not owned by the project owner indicates that existing mitigation measures are not resulting in effective mitigation. The AQCMP shall include a section detailing how the additional mitigation measures will be accomplished within the time limits specified. The AQCMM or delegate shall implement the following procedures for additional mitigation measures in the event that such visible dust plumes are observed:

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

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

Step 3: The AQCMM or delegate shall direct a temporary shutdown of the activity causing the emissions if Step 2 specified above fails to result in effective mitigation within one hour of the original determination. The activity shall not restart until the AQCMM or delegate is satisfied that appropriate additional mitigation or other site conditions have changed so that visual dust plumes will not result upon restarting the shutdown activity. The owner/ operator may appeal to the CPM any directive from the AQCMM or delegate to shut down an activity, provided that the shutdown shall go into effect within one hour of the original determination, unless overruled by the CPM before that time.

Verification: The AQCMM shall provide the CPM a Monthly Compliance Report to include:

A. a summary of all actions taken to maintain compliance with this condition;

B. copies of any air quality-related complaints filed with the district or facility representatives in relation to project construction; and

C. any other documentation deemed necessary by the CPM and AQCMM to verify compliance with this condition. Such information may be provided via electronic format or disk at the project owner's discretion.

AQ-SC5 Diesel-Fueled Engine Control: The AQCMM shall submit to the CPM, in the Monthly Compliance Report, a table that demonstrates compliance with the AQCMP mitigation measures for purposes of controlling diesel construction-related combustion emissions. Any deviation from the AQCMP mitigation measures requires prior CPM notification and approval.

All off-road diesel construction equipment used in the construction of this facility shall be powered by the cleanest engines available that also comply with the California Air Resources Board's (ARB's) Regulation for In-Use Off-Road Diesel Fleets and shall be included in the Air Quality Construction Mitigation Plan (AQCMP) required by **AQ-SC2**. The AQCMP measures shall include the following, with the lowest-emitting engine chosen in each case, as available:

a. All off-road vehicles with compression ignition engines shall comply with the California Air Resources Board's (ARB's)Regulation for In-Use Off-Road Diesel Fleets (California Code of Regulation Title 13, Article 4.8, Chapter 9, §2449 et. seq.).

b. To meet the highest level of emissions reduction available for the engine family of the equipment, each piece of diesel-powered equipment shall be powered by a Tier 4 engine (without add-on controls) or Tier 4i engine (without ad-on controls), or a Tier 3 engine with a post-combustion retrofit device verified by the ARB or the US EPA. For PM, the retrofit device shall be a particulate filter if verified, or a flow-through filter, or at least an oxidation catalyst. For NOx, the device shall meet the latest Mark level verified to be available.

c. For diesel powered equipment where the requirements of Part "b" cannot be met, the equipment shall be equipped with a Tier 3 engine without retrofit control devices or with a Tier 2 or lower Tier engine using retrofit controls verified by ARB or US EPA as the best available control device to reduce exhaust emissions of PM and nitrogen oxides (NOx) unless certified by engine manufacturers or the on-site AQCMM that the use of such devices is not practical for specific engine types. For purposes of this condition, the use of such devices can be considered "not practical" for the following, as well as other, reasons:

   1. There is no available retrofit control device that has been verified by either the California Air Resources Board or U.S. Environmental Protection Agency to control the engine in question and the highest level of available control using retrofit or Tier 1 engines is being used for the engine in question; or

   2. The use of the retrofit device would unduly restrict the vision of the operator such that the vehicle would be unsafe to operate because the device would impair the operator's vision to the front, sides, or rear of the vehicle, or

   3. The construction equipment is intended to be on site for 10 work days or less.

d. The CPM may grant relief from a requirement in Part "b" or "c" if the AQCMM can demonstrate a good faith effort to comply with the requirement and that compliance is not practical.

e. The use of a retrofit control device may be terminated immediately provided that the CPM is informed within 10 working days of the termination and a replacement for the equipment item in question meeting the level of control required occurs within 10 work days of termination of the use (if the equipment would be needed to continue working at this site for more than 15 work days after the use of the retrofit control device is terminated) if one of the following conditions exists:

   1. The use of the retrofit control device is excessively reducing the normal availability of the construction equipment due to increased down time for maintenance, and/or reduced power output due to an excessive increase in exhaust back pressure.

2. The retrofit control device is causing or is reasonably expected to cause engine damage.

3. The retrofit control device is causing or is reasonably expected to cause a substantial risk to workers or the public.

4. Any other seriously detrimental cause which has the approval of the CPM prior to implementation of the termination.

f. All equipment with engines meeting the requirements above shall be properly maintained and the engines tuned to the engine manufacturer's specifications. Each engine shall be in its original configuration and the equipment or engine must be replaced if it exceeds the manufacturer's approved oil consumption rate.

g. Construction equipment will employ electric motors when feasible.

h. If the requirements detailed above cannot be met, the AQCMM shall certify that a good faith effort was made to meet these requirements and this determination must be approved by the CPM.

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

Verification: The AQCMM shall include in the MCR the following to demonstrate control of diesel construction-related emissions:

A. A summary of all actions taken to control diesel construction related emissions;

B. A list of all heavy equipment used on site during that month, showing the tier level of each engine and the basis for alternative compliance with this condition for each engine not meeting Part "b" or Part "c" requirements. The list shall include the owner of the equipment and a letter from each owner indicating that the equipment has been properly maintained; and

C. Any other documentation deemed necessary by the CPM and AQCMM to verify compliance with this condition. Such information may be provided via electronic format or disk at the project owner's discretion.

AQ-SC6 During the construction phase of this project, the project owner shall conduct a local street sweeping program to provide at least 8.26 lbs/day PM10 and 0.79 lbs/day PM2.5 of emissions reductions. The project owner shall provide, for approval, a Construction Particular Matter Mitigation Plan (CPMMP) that details the steps to be taken and the reporting requirements necessary to ensure the implementation of the local street sweeping program.

Verification: At least 90 days prior to the start of any ground disturbance, the project owner shall submit the CPMMP to the CPM for approval. The CPM will notify the project owner of any necessary modifications to the plan within 30 days from the date of receipt. The CPMMP must be approved by the CPM before the start of ground disturbance. During construction the project owner shall provide the records of the sweeping program in the Monthly Compliance Report.

AQ-SC7 The project owner shall provide the CPM copies of all district issued Permit-to-Construct (PTC) and Permit-to-Operate (PTO) documents for the facility. The project owner shall submit an amendment request to the CPM for review and approval any modification proposed by the project owner to any project air permit. The project owner shall submit to the CPM any modification to any permit proposed by the district or U.S. EPA, and any revised permit issued by the district or U.S. EPA, for the project.

Verification: The project owner shall submit any PTC, PTO, and proposed air permit modifications to the CPM within five working days of its submittal either by: 1) the project owner to an agency, or 2) receipt of proposed modifications from an agency. The project owner shall submit all modified air permits to the CPM within 15 days of receipt.

AQ-SC8 The project owner shall submit to the CPM Quarterly Operation Reports, following the end of each calendar quarter, that include operational and emissions information as necessary to demonstrate compliance with the Conditions of Certification herein. The Quarterly Operation Report shall specifically note or highlight incidences of noncompliance.

Verification: The project owner shall submit the Quarterly Operation Reports to the CPM and APCO no later than 30 days following the end of each calendar quarter.

DISTRICT PRELIMINARY DETERMINATION OF COMPLIANCE CONDITIONS (SCAQMD 2014A)

The following SCAQMD conditions (**AQ-1** to **AQ-41**) apply to each unit of equipment, and the proposed HBEP facility as a whole.

FACILITY

AQ-1 The project owner shall limit emissions from this facility as follows:

CONTAMINANT	EMISSIONS LIMIT
PM	Less than 100 TONS IN ANY ONE YEAR

For purposes of this condition, the PM shall be defined as particulate matter with aerodynamic diameter of 2.5 microns or less.

For purposes of demonstrating compliance with the 100 tons per year limit the project owner shall determine the PM2.5 emissions for each of the major sources at this facility by calculating a 12 month rolling average using the calendar monthly fuel use data and following emission factors for each turbine PM2.5 = 3.36 lbs/mmcf with no duct firing and PM2.5 = 5.22 lbs/mmcf with duct firing, for Boiler 1 PM2.5 = 1.86 lbs/mmscf, for Boiler 2 PM2.5 = 2.1 lbs/mmscf.

The project owner may apply to change the factors, via permit application, once a different value is demonstrated, subject to SCAQMD review of testing procedures and protocols.

The project owner shall submit written reports of the monthly PM2.5 compliance demonstrations required by this condition. The report submittal shall be included with the semiannual Title V report as required under Rule 3004(a)(4)(f). Records of the monthly PM2.5 compliance demonstrations shall be maintained on site for at least five years and made available upon SCAQMD request.

[Rule 1325]

Verification: The project owner shall submit to the CPM and the District the facility annual operating and emissions data demonstrating compliance with this condition as part of the fourth quarter's Quarterly Operation Report (**AQ-SC8**).

AQ-2 This facility is subject to the applicable requirements of the following rules or regulations:

The facility shall submit a detailed retirement plan for the permanent shutdown of Huntington Beach (HB) Boilers 1 and 2 and Redondo Beach (RB) Boilers 6 and 8 describing in detail the steps and schedule that will be taken to render the boilers permanently inoperable. The retirement plan shall be submitted to SCAQMD within 60 days after the Permits to Construct for gas turbine Units 1A, 1B, 1C, 2A, 2B, and 2C are issued.

The retirement plan must be approved in writing by SCAQMD. AES shall not commence any construction of HB Boilers 1 and 2 and RB Boilers 6 and 8 repowering project equipment including gas turbines 1A, 1B, 1C, 2A, 2B, 2C, steam turbines 1 and 2, SCR/CO catalysts for gas turbines 1A, 1B, 1C, 2A, 2B, and 2C, or the oil water separator, before the retirement plan is approved in writing by SCAQMD. If SCAQMD notifies AES that the plan is not approvable, AES shall submit a revised plan addressing SCAQMD's concerns within 30 days.

Within 30 calendar days of actual shutdown, or by no later than December 31, 2018, AES shall provide SCAQMD with a notarized statement that HB Beach Boilers 1 and 2 and RB Boilers 6 and 8 are permanently shut down and that any restart or operation of the units shall require new Permits to Construct and be subject to all requirements of non-attainment new source review and the prevention of significant deterioration program.

AES shall notify SCAQMD 30 days prior to the implementation of the approved retirement plan for permanent shutdown of HB Boilers 1 and 2 and RB Boilers 6 and 8, or advise SCAQMD as soon practicable should AES undertake permanent shutdown prior to December 31, 2018.

AES shall cease operation of RB Boilers 6 and 8 within 90 calendar days of the first fire of Units 1A, 1B, or 1C, and AES shall cease operation of HB Boilers 1 and 2 within 90 calendar days of the first fire of Units 2A, 2B, or 2C.

[Rule 1304 – Modeling and Offset Exemption]

Verification: The project owner shall submit the retirement plan and any modifications to the plan to the CPM within five working days of its submittal either by: 1) the project owner to district, or 2) receipt of proposed modifications from district. The project owner shall make site available for inspection of records by representatives of the District, ARB, and the Energy Commission.

AQ-3 This facility is subject to the applicable requirements of the following rules or regulations:

For all circuit breakers at the facility utilizing SF_6, the project owner shall install, operate, and maintain enclosed-pressure SF_6 circuit breakers with a maximum annual leak rate of 0.5 percent by weight. The circuit breakers shall be equipped with a 10 percent by weight leak detection system. The leak detection system shall be calibrated in accordance with manufacturer's specifications. The manufacturer's specifications and all records of calibrations shall be maintained on site.

The total CO2e emissions from all circuit breakers shall not exceed 6.8 tons per calendar year.

[Rule 1714]

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

EACH GAS TURBINE

AQ-4 The project owner shall limit emission from this equipment as follows:

CONTAMINANT	EMISSION LIMIT
PM10	4,278.0 LBS IN ANY ONE MONTH
CO	12,776.2 LBS IN ANY ONE MONTH
VOC	7,487.2 LBS IN ANY ONE MONTH

The above limits apply after the equipment is commissioned. The above limits apply to each turbine.

The project owner shall calculate compliance with the emission limit(s) by using fuel use data and the following emission factors: VOC: 2.94 lbs/mmcf, PM10: 3.36 lbs/mmcf with no duct burner firing, 5.22 lbs/mmcf with duct burner firing.

The project owner may apply to change the factors, via permit application, once a different value is demonstrated, subject to SCAQMD review of testing procedures and protocols.

The project owner shall calculate compliance with the emission limits for CO after the CO CEMS certification based upon readings from the SCAQMD certified CEMS.

The project owner shall limit the annual firing hours for each turbine to 6370 hours including no more than 470 hours with duct firing (this does not include start up and shutdown hours)

[Rule 1303 – Offsets]

Verification: The project owner shall provide emissions summary data in compliance with this condition as part of the Quarterly Operation Reports (**AQ-SC8**). The project owner shall make the site available for inspection of records by representatives of the District, ARB, and the Energy Commission.

AQ-5 The project owner shall limit emission from this equipment as follows:

CONTAMINANT	EMISSION LIMIT
PM10	2,930 LBS IN ANY ONE MONTH
CO	112,882 LBS IN ANY ONE MONTH
VOC	14,121 LBS IN ANY ONE MONTH

The above limits apply during commissioning. The above limits apply to each turbine.

The project owner shall calculate compliance with the emission limit(s) by using fuel use data and the following emission factors: VOC: 21.74 lbs/mmcf, PM10: 4.51 lbs/mmcf, and CO: 173.80 lbs/mmcf.

Verification: The project owner shall provide emissions summary data in compliance with this condition as part of the Quarterly Operation Reports (**AQ-SC8**). The project owner shall make the site available for inspection of records by representatives of the District, ARB, and the Energy Commission.

AQ-6 The 12.75 LBS/MMCF NOx emission limits shall only apply during turbine operation prior to CEMS certification for reporting NOx emissions.

[Rule 2012]

Verification: The project owner shall demonstrating compliance with this condition as part of the Quarterly Operation Reports (**AQ-SC8**).

AQ-7 The 2.0 PPMV NOX emission limit(s) is averaged over 60 minutes at 15 percent O_2, dry. This limit shall not apply during commissioning, turbine start ups and turbine shutdowns.

[Rule 1703-PSD, Rule 2005]

<u>Verification</u>: The project owner shall submit CEMS records demonstrating compliance with this condition as part of the Quarterly Operation Reports (**AQ-SC8**).

AQ-8 The 2.0 PPMV CO emission limit(s) is averaged over 60 minutes at 15 percent O_2, dry. This limit shall not apply during commissioning, turbine start ups and turbine shutdowns.

[Rule 1703-PSD]

<u>Verification</u>: The project owner shall submit CEMS records demonstrating compliance with this condition as part of the Quarterly Operation Reports (**AQ-SC8**).

AQ-9 The 2.0 PPMV VOC emission limit(s) is averaged over 60 minutes at 15 percent O_2, dry. This limit shall not apply during commissioning, turbine start ups and turbine shutdowns.

[Rule 1303(a) – BACT, Rule 1303(b)(1) – Modeling, Rule 1303(b)(2) - Offsets]

<u>Verification</u>: The project owner shall submit CEMS records demonstrating compliance with this condition as part of the Quarterly Operation Reports (**AQ-SC8**).

AQ-10 For the purpose of determining compliance with District Rule 475, combustion contaminants emissions may exceed the concentration limit or the mass emission limit listed, but not both limits at the same time.

[Rule 475]

<u>Verification</u>: The project owner shall demonstrating compliance with this condition as part of the Quarterly Operation Reports (**AQ-SC8**). The project owner shall make the site available for inspection of records by representatives of the District, ARB, and the Energy Commission.

AQ-11 The project owner shall not use natural gas containing the following specified compounds:

Compound	Grains per 100 scf
H_2S	Greater than 0.25

This concentration limit is an annual average based on monthly sample of natural gas composition or gas supplier documentation. Gaseous fuel samples shall be tested using District Method 307-91 for total sulfur calculated as H_2S.

[Rule 1303(b) – Offset]

<u>Verification</u>: The project owner shall submit fuel usage records and calculations required to demonstrate compliance with this condition as part of the Quarterly Operational Reports (**AQ-SC8**).

AQ-12 The project owner shall limit the number of startups to no more than 90 in any one calendar month.

The number of cold start ups shall not exceed 5 per months, the number of warm start ups shall not exceed 25 per month, and the number of hot start ups shall not exceed 60 per month.

For the purposes of this condition:

A cold start up is defined as a startup which occurs after the steam turbine has been shut down for 49 hours or more. A cold start up shall not exceed 90 minutes. Emissions from a cold start up shall not exceed the following: NOx - 29 lbs., CO – 116 lbs., VOC – 28 lbs.

A warm start up is defined as a startup which occurs after the steam turbine has been shut down for 9 – 49 hours. A warm start up shall not exceed 32.5 minutes. Emissions from a warm start up shall not exceed the following: NOx - 17 lbs., CO – 46 lbs., VOC – 21 lbs.

A hot start up is defined as a startup which occurs after the steam turbine has been shut down for less than 9 hours. A hot start up shall not exceed 32.5 minutes. Emissions from a hot start up shall not exceed the following: NOx - 17 lbs., CO – 34 lbs., VOC – 21 lbs.

The beginning of a start up occurs at initial fire in the combustor and the end of startup occurs when the BACT levels are achieved. If during start up the process is aborted the process will count as one start up.

The project owner shall maintain records, in a manner approved by the SCAQMD to demonstrate compliance with this condition.

[Rule 2005]

<u>Verification</u>: The project owner shall provide a table demonstrating compliance with this condition as part of the Quarterly Operation Reports (**AQ-SC8**). The project owner shall make the site available for inspection of records by representatives of the District, ARB, and the Energy Commission.

AQ-13 The project owner shall limit the number of shutdowns to no more than 90 in any one calendar month.

Shutdown time shall not exceed 10 minutes per shutdown. Emissions from a shutdown shall not exceed the following: NOx - 9 lbs., CO – 46 lbs., VOC – 31 lbs.

The project owner shall maintain records, in a manner approved by the SCAQMD to demonstrate compliance with this condition.[Rule 2005]**<u>Verification</u>:** The project owner shall provide a table demonstrating compliance with this condition as part of the Quarterly Operation Reports (**AQ-SC8**). The project owner shall make the site available for inspection of records by representatives of the District, ARB, and the Energy Commission.

AQ-14 The project owner shall limit the power output of the plant to no more than 939 MWs.

The 939 MW limit is based on the net power output.

The net electrical output shall be measured at the breaker of the transmission system interconnection point in the generation switchyard. The monitoring equipment shall meet ANSI Standard No. C12 or equivalent, and have an accuracy of +/-0.2 percent.

The net electrical output from each meter shall be recorded at the CEMS data acquisition system.

The project owner shall maintain records, for a minimum of five years, in a manner approved by the SCAQMD to demonstrate compliance with this condition.

[Rule 1304 - Modeling and Offset Exemption]

Verification: The project owner shall report the maximum net megawatts generated monthly to demonstrate compliance with this condition as part of the Quarterly Operation Reports (**AQ-SC8**). The project owner shall make the site available for inspection of records by representatives of the District, ARB, and the Energy Commission.

AQ-15 The project owner shall limit the power output of the plant to no more than 972 MW gross.

The 972 MW limit is based on the gross power output.

The gross electrical output shall be measured at the each of the 8 generators.

The monitoring equipment shall meet ANSI Standard No. C12 or equivalent, and have an accuracy of +/-0.2 percent.

The gross electrical output from generators shall be recorded at the CEMS data acquisition system.

The project owner shall maintain records, for a minimum of five years, in a manner approved by the SCAQMD to demonstrate compliance with this condition.

[Rule 1304 - Modeling and Offset Exemption]

Verification: The project owner shall report the maximum gross megawatts generated monthly to demonstrate compliance with this condition as part of the Quarterly Operation Reports (**AQ-SC8**). The project owner shall make the site available for inspection of records by representatives of the District, ARB, and the Energy Commission.

AQ-16 The project owner shall conduct source test(s) for the pollutant(s) identified below.

Pollutant to be tested	Required Test Method(s)	Averaging Time	Test Location
NO_X emissions	District Method 100.1	1 hour	Outlet of the SCR
CO emissions	District Method 100.1	1 hour	Outlet of the SCR
SO_X emissions	Approved District method	District approved averaging time	Fuel Sample
VOC emissions	Approved District method	1 hour	Outlet of the SCR
PM10 emissions	Approved District method	District approved averaging time	Outlet of the SCR
PM2.5	Approved District method	District approved averaging time	Outlet of the SCR
NH3 emissions	District method 207.1 and 5.3 or EPA method 17	1 hour	Outlet of the SCR

The test shall be conducted after SCAQMD approval of the source test protocol, but no later than 180 days after initial start-up. The SCAQMD shall be notified of the date and time of the test at least 10 days prior to the test.

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

The test shall be conducted in accordance with an SCAQMD approved test protocol. The protocol shall be submitted to the SCAQMD engineer no later than 45 days before the proposed test date and shall be approved by the SCAQMD before the test commences. The test protocol shall include the proposed operating conditions of the turbine during the tests, the identity of the testing lab, a statement from the testing lab certifying that it meets the criteria of Rule 304, and a description of all sampling and analytical procedures.

The test shall be conducted when this equipment is operating at loads of 100 and 70 percent without duct firing, and 100 percent with duct firing.

For natural gas fired turbines only, volatile organic compound (VOC) compliance shall be demonstrated as follows: a) stack gas samples are extracted into Summa canisters maintaining a final canister pressure between 400-500 mm Hg absolute, b) pressurization of canisters are done with zero gas analyzed/certified to contain less than 0.05 ppmv total hydrocarbon as carbon, and c) analysis of canisters are per EPA Method TO-12 (with pre concentration) and temperature of canisters when extracting samples for analysis is not below 70 deg F.The use of this alternative method is solely for the determination of compliance with the VOC BACT level of 2.0 ppmv calculated as carbon for natural gas fired turbines. The results shall be reported with two significant digits.

[Rule 1303(a)(1) – BACT, Rule 1303(b)(2) – Offset, Rule 1703-PSD, Rule 2005]

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

AQ-17 The project owner shall conduct source test(s) for the pollutant(s) identified below.

Pollutant to be tested	Required Test Method(s)	Averaging Time	Test Location
NH_3 emissions	District method 207.1 and 5.3 or EPA method 17	1 hour	Outlet of the SCR

The test shall be conducted and the results submitted to the District within 60 days after the test date. The SCAQMD shall be notified of the date and time of the test at least 10 days prior to the test.

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

The test shall be conducted to demonstrate compliance with the Rule 1303 concentration limit

[Rule 1303(a)(1) – BACT]

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

AQ-18 The project owner shall conduct source test(s) for the pollutant(s) identified below.

Pollutant to be tested	**Required Test Method(s)**	**Averaging Time**	**Test Location**
SOX emissions	Approved District method	District approved averaging time	Fuel Sample
VOC emissions	Approved District method	1 hour	Outlet of the SCR
PM10 emissions	Approved District method	District approved averaging time	Outlet of the SCR

The test shall be conducted at least once every three years.

The test shall be conducted and the results submitted to the SCAQMD within 60 days after the test date. The SCAQMD shall be notified of the date and time of the test at least 10 days prior to the test.

The test shall be conducted when this equipment is operating at 100 percent of maximum heat input.

For natural gas fired turbines only, volatile organic compound (VOC) compliance shall be demonstrated as follows: a) stack gas samples are extracted into Summa canisters maintaining a final canister pressure between 400-500 mm Hg absolute, b) pressurization of canisters are done with zero gas analyzed/certified to contain less than 0.05 ppmv total hydrocarbon as carbon, and c) analysis of canisters are per EPA Method TO-12 (with pre concentration) and temperature of canisters when extracting samples for analysis is not below 70 deg F.

The use of this alternative method is solely for the determination of compliance with the VOC BACT level of 2.0 ppmv calculated as carbon for natural gas fired turbines. The results shall be reported with two significant digits.

The test shall be conducted to demonstrate compliance with the Rule 1303 concentration and/or monthly emission limit.

[Rule 1303(a)(1) – BACT, Rule 1303(b)(2) – Offset, Rule 475]

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

AQ-19 The project owner shall install and maintain a continuous emissions monitoring system (CEMS) to measure the following parameters:

CO concentration in ppmv

Concentrations shall be corrected to 15 percent oxygen on a dry basis. The CEMS shall be installed and operating no later than 90 days after initial startup of the turbine, in accordance with approved SCAQMD Rule 218 CEMS plan application. The project owner shall not install the CEMS prior to receiving initial approval from SCAQMD.

The CEMS shall be installed and operated to measure the CO concentration over a 15 minute averaging time period.

The CEMS shall convert the actual CO concentrations to mass emission rates (lbs/hr) using the equation below and record the hourly emission rates on a continuous basis.

CO Emission Rate, lbs/hr = K*Cco*Fd[20.9/(20.9%-%O_2 d)][(Qg*HHV)/10E6], where

K = 7.267×10^{-8} (lbs/scf)/ppm

Cco = Average of 4 consecutive 15 min. average CO concentrations, ppm

Fd = 8710 dscf/MMBTU natural gas

%O_2, d= Hourly average % by volume O_2 dry, corresponding to Cco

Qg = Fuel gas usage during the hour, scf/hr

HHV = Gross high heating value of the fuel gas, BTU/scf

[Rule 1303 – BACT, Rule 1703-PSD]

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

AQ-20 The project owner shall install and maintain a CEMS to measure the following parameters:

NOx concentration in ppmv

Concentrations shall be corrected to 15 percent oxygen on a dry basis. The CEMS shall be installed and operating no later than 90 days after initial startup of the turbine, in accordance with approved SCAQMD Regulation XX CEMS plan application. The project owner shall not install the CEMS prior to receiving initial approval from SCAQMD.

Rule 2012 provisional relative accuracy test audit (RATA) testing shall be completed and submitted to the SCAQMD within 90 days of the conclusion of the turbine commissioning period. During the interim period between the initial start up and the provisional certification date of the CEMS, the project owner shall comply with the requirements of Rule 2012(h)(2) and 2012(h)(3).

[Rule 1703 – PSD, Rule 2005, Rule 2012]

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

AQ-21 The project owner shall install this equipment according to the following requirements:

Construction shall commence within 12 months of the date of the permit to construct unless the permit is extended, but in no case should the start of construction exceed 18 months from the date of the permit to construct. Construction shall not be discontinued for a period of 18 months or more.

[Rule 205, 40 CFR Part 52]

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

AQ-22 The project owner shall upon completion of the construction, operate and maintain this equipment according to the following specifications:

In accordance with all mitigation measures stipulated in the final California Energy Commission decision for the 12-AFC-02 project.

[CEQA]

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

AQ-23 The project owner shall install this equipment according to the following requirements:

Total commissioning hours shall not exceed 491 hours of operation for each turbine from the date of initial turbine start up. Total commissioning hours without control shall not exceed 47 hours of operation for each turbine. Only one turbine shall undergo steam blows at any one time and at a load of no more than 50%. During steam blows, the other two turbines in the block shall not be fired. During all other commissioning activities outside of steam blows, a maximum of 2 turbines may be operated at any one time.

The project owner shall vent this equipment to the CO oxidation catalyst and SCR control system whenever the turbine is in operation after commissioning.

The project owner shall provide SCAQMD with written notification of the initial startup date. Written records of commissioning, start ups, and shutdowns shall be maintained and be made available upon request from SCAQMD.

[Rule 1303 – BACT, Rule 1303 – Offsets, Rule 1703 – PSD, Rule 2005]

Verification: The project owner shall submit CEMS records to demonstrate compliance with this condition as part of the Quarterly Operation Reports (**AQ-SC8**).

AQ-24 The project owner shall, upon completion of the construction, operate and maintain this equipment according to the following specifications:

The project owner shall record the total net and gross power generated in a calendar month in megawatt-hours.

The project owner shall calculate and record greenhouse gas emissions for each calendar month using the following formula:

GHG = 60.08 * FF

Where, GHG is the greenhouse gas emissions in tons of CO2 and FF is the monthly fuel usage in millions standard cubic feet.

The project owner shall calculate and record the GHG emissions in pounds per net megawatt-hours on the 12-month rolling average. The GHG emissions from this equipment shall not exceed 652,827 tons per year on a 12-month rolling average basis. The calendar annual average GHG emissions shall not exceed 1,000[2] lbs of carbon dioxide per net megawatt-hour, or the applicable limit which is published in the final EPA rule.

The project owner shall maintain records in a manner approved by the SCAQMD to demonstrate compliance with this condition. The records shall be made available to SCAQMD upon request.

[Rule 1714, 40 CFR60 Subpart KKKK]

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

AQ-25 This equipment shall not be operated unless the facility holds 39,854 pounds of NOx RECLAIM Trading Credits (RTCs) in its allocation account to offset the annual emissions increase for the first year of operation. The RTCs held to satisfy the first year of operation portion of this condition may be transferred only after one year from the initial start of operation. In addition, this equipment shall not be operated unless the project owner demonstrates

[2] The PDOC allows higher values, but the federal New Source Performance Standard published January 8, 2014 is expected to apply to this facility, which would limit carbon dioxide emission to 1,000 lbs per MWh.

to the Executive Officer that, at the commencement of each compliance year after the start of operation, the facility holds 62,507 pounds of NOx RTCs valid during that compliance year. RTCs held to satisfy the compliance year portion of this condition may be transferred only after the compliance year for which the RTCs are held. If the initial or annual hold amount is partially satisfied by holding RTCs that expire midway through the hold period, those RTCs may be transferred upon their respective expiration dates. This hold amount is in addition to any other amount of RTCs required to be held under other condition(s) stated in this permit.

[Rule 2005]

Verification: The project owner shall submit to the CPM copies of all RECLAIM reports filed with the District as part of Quarterly Operation Reports (**AQ-SC8**).

AQ-26 This equipment shall not be operated unless the facility holds 2,694 pounds of SOx RECLAIM Trading Credits (RTCs) in its allocation account to offset the annual emissions increase for the first year of operation. The RTCs held to satisfy the first year of operation portion of this condition may be transferred only after one year from the initial start of operation. In addition, this equipment shall not be operated unless the project owner demonstrates to the Executive Officer that, at the commencement of each compliance year after the start of operation, the facility holds 3,798 pounds of SOx RTCs valid during that compliance year. RTCs held to satisfy the compliance year portion of this condition may be transferred only after the compliance year for which the RTCs are held. If the initial or annual hold amount is partially satisfied by holding RTCs that expire midway through the hold period, those RTCs may be transferred upon their respective expiration dates. This hold amount is in addition to any other amount of RTCs required to be held under other condition(s) stated in this permit.

[Rule 2005]

Verification: The project owner shall submit to the CPM copies of all RECLAIM reports filed with the District as part of Quarterly Operation Reports (**AQ-SC8**).

AQ-27 The project owner shall provide to the District a source test report in accordance with the following specifications:

Source test results shall be submitted to the District no later than 60 days after the source tests required under conditions **AQ-16**, **AQ-17**, and **AQ-18** are conducted.

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

All exhaust flow rate shall be expressed in terms of dry standard cubic feet per minute (DSCFM) and dry actual cubic feet per minute. All moisture concentration shall be expressed in terms of percent corrected to 15 percent oxygen.

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

[Rule 1303(a)(1) – BACT, Rule 1303(b)(2) – Offset]

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

AQ-28 The project owner shall keep records in a manner approved by the District, for the following parameter(s) or item(s):

Commissioning hours and type of control and fuel use

Date, time, and duration of each start-up and shutdown, and the type of startup (cold, warm, or hot).

In addition to the requirements of a certified continuous emissions monitoring system (CEMS), natural gas fuel use records shall be kept during and after the commissioning period and prior to CEMS certification

Minute by minute data (NO_2 and O_2 concentration and fuel flow rate at a minimum) for each turbine start up

Monthly number of hours each turbine is operated with duct firing

Total annual power output in MWh

[Rule 1303(b)(2) - Offsets]

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

DUCT BURNER

AQ-29 This equipment shall not be operated unless the facility holds 13,488 pounds of NOx RECLAIM Trading Credits (RTCs) in its allocation account to offset the annual emissions increase for the first year of operation. The RTCs held to satisfy the first year of operation portion of this condition may be transferred only after one year from the initial start of operation. In addition, this equipment shall not be operated unless the project owner demonstrates to the Executive Officer that, at the commencement of each compliance year after the start of operation, the facility holds 21,155 pounds of NOx RTCs valid during that compliance year. RTCs held to satisfy the compliance year portion of this condition may be transferred only after the compliance year for which the RTCs are held. If the initial or annual hold amount is partially satisfied by holding RTCs that expire midway through the hold period, those RTCs may be transferred upon their respective expiration dates. This hold amount is in addition to any other amount of RTCs required to be held under other condition(s) stated in this permit.

[Rule 2005]

Verification: The project owner shall submit to the CPM copies of all RECLAIM reports filed with the District as part of Quarterly Operation Reports (**AQ-SC8**).

AQ-30 This equipment shall not be operated unless the facility holds 912 pounds of SOx RECLAIM Trading Credits (RTCs) in its allocation account to offset the annual emissions increase for the first year of operation. The RTCs held to satisfy the first year of operation portion of this condition may be transferred only after one year from the initial start of operation. In addition, this equipment shall not be operated unless the project owner demonstrates to the Executive Officer that, at the commencement of each compliance year after the start of operation, the facility holds 1,286 pounds of SOx RTCs valid during that compliance year. RTCs held to satisfy the compliance year portion of this condition may be transferred only after the compliance year for which the RTCs are held. If the initial or annual hold amount is partially satisfied by holding RTCs that expire midway through the hold period, those RTCs may be transferred upon their respective expiration dates. This hold amount is in addition to any other amount of RTCs required to be held under other condition(s) stated in this permit.

[Rule 2005]

Verification: The project owner shall submit to the CPM copies of all RECLAIM reports filed with the District as part of Quarterly Operation Reports (**AQ-SC8**).

SCR

AQ-31 The 5 ppmv NH_3 emission limit is averaged over 60 minutes at 15% O_2, dry basis. The project owner shall calculate and continuously record the NH_3 slip concentration using the following:

NH_3 (ppmv) = [a–b*(c*1.2)/1E+06]*1E+06/b

where,

a = NH3 injection rate (lbs/hr)/17(lb/lb-mol)

b = dry exhaust gas flow rate (standard cubic feet (scf)/hr)/385.3 scf/lb-mol)

c = change in measured NOx across the SCR (ppmvd at 15% O_2)

The project owner shall install and maintain a NOx analyzer to measure the SCR inlet NOx ppmv accurate to plus or minus 5 percent calibrated at least once every twelve months. The NOx analyzer shall be installed and operated within 90 days of initial start-up.

The project owner shall use the above described method or another alternative method approved by the Executive Officer.

The ammonia slip calculation procedures described above shall not be used for compliance determination or emission information without corroborative data using an approved reference method for the determination of ammonia.

[Rule 1303(a)(1) – BACT]

Verification: The project owner shall include exceedances of the hourly ammonia slip limit as part of the Quarterly Operation Reports (**AQ-SC8**). Exceedances of the ammonia limit shall be reported as prescribed herein. Chronic exceedances of the ammonia slip limit shall be identified by the project owner and confirmed by the CPM within 60 days of the fourth quarter Quarterly Operation Report (**AQ-SC8**) being submitted to the CPM. If a chronic exceedance is identified and confirmed, the project owner shall work in conjunction with the CPM to develop a reasonable compliance plan to investigate and redress the chronic exceedance of the ammonia slip limit within 60 days of the above confirmation. The project owner shall include all calibration results performed as part of Quarterly Operation Reports (**AQ-SC8**).

AQ-32 The project owner shall install and maintain a(n) flow meter to accurately indicate the flow rate of the total hourly throughput of injected ammonia.

The project owner shall also install and maintain a device to continuously record the parameter being measured.

The measuring device or gauge shall be accurate to within plus or minus 5 percent. It shall be calibrated once every twelve months.

The injected ammonia rate shall be maintained within 11.8 gal/min and 33 gal/min except during start ups and shutdowns

[Rule 1303(a)(1) – BACT]

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

AQ-33 The project owner shall install and maintain a(n) temperature gauge to accurately indicate the temperature in the exhaust at the inlet to the SCR reactor.

The project owner shall also install and maintain a device to continuously record the parameter being measured.

The measuring device or gauge shall be accurate to within plus or minus 5 percent. It shall be calibrated once every twelve months.

The exhaust temperature at the inlet of the selective catalytic reduction shall be maintained between 400-700 deg F except during start up and shutdowns

[Rule 1303(a)(1) – BACT]

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

AQ-34 The project owner shall install and maintain a(n) pressure gauge to accurately indicate the differential pressure across the selective catalytic reduction catalyst bed in inches of water column.

The project owner shall also install and maintain a device to continuously record the parameter being measured.

The measuring device or gauge shall be accurate to within plus or minus 5 percent. It shall be calibrated once every twelve months.

The differential pressure shall be maintained between 1.5 " WC and 3.5 " WC.

[Rule 1303(a)(1) – BACT]

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

AQ-35 For the purpose of the following condition number(s), continuously record shall be defined as recording at least once every hour and shall be calculated based upon the average of the continuous monitoring for that hour.

Condition Number **AQ-32**

Condition Number **AQ-33**

[Rule 1303(a)(1) – BACT]

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

AQ-36 For the purpose of the following condition numbers, continuous monitoring shall be defined as measuring at least once every month and shall be calculated based upon the average of the continuous monitoring for that month.

Condition Number: **AQ-34**

[Rule 1303(a)(1) – BACT]

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

AQ-37 The project owner shall upon completion of the construction, operate and maintain this equipment according to the following specifications:

In accordance with all mitigation measures stipulated in the final California Energy Commission decision for the 12-AFC-2 project.

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

CO Catalyst

AQ-38 The project owner shall install and maintain a(n) temperature gauge to accurately indicate the temperature in the exhaust at the inlet to the CO Catalyst.

The project owner shall also install and maintain a device to continuously record the parameter being measured.

The measuring device or gauge shall be accurate to within plus or minus 5 percent. It shall be calibrated once every twelve months.

The exhaust temperature at the inlet of the CO Catalyst shall be maintained at a minimum of 500 deg F except during start up and shutdowns

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

Ammonia Storage Tank

AQ-39 The project owner shall vent this equipment, during filling, only to the vessel from which it is being filled.

[Rule 1303(a)(1)-BACT]

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

AQ-40 The project owner shall install and maintain a pressure relief valve set at 50 pounds per square inch gage (psig).

[Rule 1303(a)(1)-BACT]

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

AQ-41 The project owner shall upon completion of the construction, operate and maintain this equipment according to the following specifications:

In accordance with all mitigation measures stipulated in the final California Energy Commission decision for the 12-AFC-2 project.

[CEQA]

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

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AIR QUALITY APPENDIX AIR-1

Greenhouse Gas Emissions

Testimony of Tao Jiang, Ph.D., P.E and David Vidaver

SUMMARY

The Huntington Beach Energy Project (HBEP) project is a proposed addition to the state's electricity system. It would be an efficient, new, dispatchable natural gas-fired combined cycle power plant that would provide fast start capabilities but would produce greenhouse gas (GHG) emissions while generating electricity for California consumers. Its addition to the system would displace other less efficient, higher GHG-emitting generation and facilitate the integration of renewable resources. Because the project will improve the efficiency of existing system resources, the addition of HBEP would contribute to a reduction of the California GHG emissions and GHG emission rate average. The relative efficiency of the HBEP project and the system build-out of renewable resources in California would result in a net cumulative reduction of GHG emissions from new and existing fossil sources of electricity. Electricity is produced by operation of an inter-connected system of generation sources. Operation of one power plant, like the HBEP, affects all other power plants in the interconnected system.

While the HBEP burns natural gas for fuel and thus produces GHG emissions that contribute cumulatively to climate change, it will have a beneficial impact on system operation and facilitate a reduction in GHG emissions in several ways:

- When dispatched,[3] the HBEP would displace less efficient (and thus higher GHG-emitting) generation. Because the project's GHG emissions per megawatt-hour (MWh) would be lower than those power plants that the project would displace, the addition of the HBEP would contribute to a reduction of California and overall Western Electricity Coordinating Council system GHG[4] emissions and GHG emission rate average.
- The HBEP would provide fast start and dispatch flexibility capabilities necessary to integrate the large amounts of variable renewable generation (also known as "intermittent energy resources") expected to meet the state's renewable portfolio standard (RPS) and GHG emission reduction targets
- The HBEP would replace capacity and generation mostly provided by aging, high GHG emitting power plants, some of which that are likely to retire in order to comply with the State Water Resource Control Board's (SWRCB) policy on the use of once through cooling (OTC).

[3] The entity responsible for balancing a region's electrical load and generation will "dispatch" or call on the operation of generation facilities. The "dispatch order" is generally dictated by the facility's electricity production cost, efficiency, location or contractual obligations.

[4] Fuel-use closely correlates to the efficiency of and carbon dioxide (CO_2) emissions from natural gas-fired power plants. And since CO_2 emissions from fuel combustion dominate greenhouse gas (GHG) emissions from power plants, the terms CO_2 and GHG are used interchangeably in this section.

- The HBEP would replace less efficient generation in the South Coast local reliability area required to meet local reliability needs, reducing the GHG emissions associated with providing local reliability services and facilitating the retirement of aging, high GHG-emitting resources in the area.
- The HBEP would facilitate to some degree the replacement of high GHG emitting (e.g., out-of-state coal) electricity generation that must be phased out to meet the State's new Emissions Performance Standard implemented by SB 1368.

CONCLUSIONS

The project would lead to a net reduction in GHG emissions across the electricity system that provides energy and capacity to California. Thus, staff believes that the project would result in a cumulative overall reduction in GHG emissions from the state's power plants, would not worsen current conditions, and would thus not result in impacts that are cumulatively significant. In addition, it would provide flexible, dispatchable and fast ramping power in relatively small increments of capacity, which should improve the electric system reliability in a high-renewables, low-GHG system.

Staff notes that mandatory reporting of GHG emissions per federal government and Air Resources Board greenhouse gas regulations would occur, and these reports will enable these agencies to gather the information needed to regulate the HBEP project in trading markets, such as those that are expected to be required by regulations implementing the California Global Warming Solutions Act of 2006 (AB 32). The project may be subject to additional reporting requirements and GHG reduction and trading requirements as these regulations are more fully developed and implemented.

Staff does not believe that the GHG emission increases from construction activities would be significant for several reasons. First, construction emissions would be temporary and intermittent, and not continue during the life of the project. Additionally, the control measures or best practices that staff recommends such as limiting idling times and requiring, as appropriate, equipment that meet the latest emissions standards, would further minimize greenhouse gas emissions. Staff believes that the use of newer equipment will increase efficiency and reduce GHG emissions and be compatible with low-carbon fuel (e.g., bio-diesel and ethanol) mandates that will likely be part of the ARB regulations to reduce GHG from construction vehicles and equipment. For all these reasons, staff concludes that the emission of greenhouse gases during construction would be sufficiently reduced and would, therefore, not be significant.

As a multi-stage generating facility, the HBEP is subject to the Greenhouse Gases Emission Performance Standard (Title 20, California Code of Regulations, section 2900 et seq.). The project would meet the standard with a rating of 0.479 metric tonnes CO_2 per megawatt-hour.

The HBEP would be consistent with all three main conditions in the precedent decision regarding GHG emissions established by the Avenal Energy Project's Final Energy Commission Decision (not increase the overall system heat rate for natural gas plants, not interfere with generation from existing or new renewable facilities, and ensure a reduction of systemwide GHG emissions).

AIR QUALITY GHG ANALYSIS – TAO JIANG

INTRODUCTION

GHG emissions are not criteria pollutants; they are discussed in the context of cumulative impacts. In December 2009, the U.S. Environmental Protection Agency (EPA) declared that greenhouse gases (GHGs) threaten the public health and welfare of the American people (the so-called "endangerment finding"), and this became effective on January 14, 2010. Regulating GHGs at the federal level is required by Prevention of Significant Deterioration Program (PSD) for sources that exceed 100,000 tons per year of carbon dioxide-equivalent emissions.

Federal rules that became effective December 29, 2009 (40 CFR 98) require federal reporting of GHGs. As federal rulemaking evolves, staff at this time focuses on analyzing the ability of the project to comply with existing federal- and state-level policies and programs for GHGs. The State has demonstrated a clear willingness to address global climate change though research, adaptation[5], and GHG inventory reductions. In that context, staff evaluates the GHG emissions from the proposed project, presents information on GHG emissions related to electricity generation, and describes the applicable GHG standards and requirements.

Generation of electricity using any fossil fuel, including natural gas, can produce greenhouse gases along with the criteria air pollutants that have been traditionally regulated under the federal and state Clean Air Acts. For fossil fuel-fired power plants, the GHG emissions include primarily carbon dioxide, with much smaller amounts of nitrous oxide (N_2O, not NO or NO_2, which are commonly known as NOx or oxides of nitrogen), and methane (CH_4 – often from unburned natural gas). Also included are sulfur hexafluoride (SF_6) from high voltage equipment and hydrofluorocarbons (HFCs) and perfluorocarbons (PFCs) from refrigeration/chiller equipment. GHG emissions from the electricity sector are dominated by CO_2 emissions from the carbon-based fuels; other sources of GHG emissions are small and also are more likely to be easily controlled or reused or recycled, but are nevertheless documented here as some of the compounds have very high relative global warming potentials.

Global warming potential is a relative measure, compared to carbon dioxide, of a compound's residence time in the atmosphere and ability to warm the planet. Mass emissions of GHGs are converted into carbon dioxide equivalent (CO2E) metric tonnes (MT) for ease of comparison.

[5] While working to understand and reverse global climate change, it is prudent to also adapt to potential changes in the state's climate (for example, changing rainfall patterns).

LAWS, ORDINANCES, REGULATIONS AND STANDARDS

The following federal, state, and local laws and policies in **Greenhouse Gas Table 1** pertain to the control and mitigation of greenhouse gas emissions. Staff's analysis examines the project's compliance with these requirements.

Greenhouse Gas Table 1
Laws, Ordinances, Regulations, and Standards (LORS)

Applicable LORS	Description
Federal	
40 Code of Federal Regulations (CFR) Parts 51, 52, 70 and 71	This rule "tailors" GHG emissions to PSD and Title V permitting applicability criteria.
40 Code of Federal Regulations (CFR) Parts 51 and 52	A new stationary source that emits more than 100,000 TPY of greenhouse gases (GHGs) is also considered to be a major stationary source subject to Prevention of Significant Determination (PSD) requirements. For permits issued on or after July 1, 2011 PSD applies to GHGs if the source is otherwise subject to PSD (for another regulated NSR pollutant), and the source has a GHG potential to emit (PTE) equal to or greater than 75,000 TPY CO2e. The proposed facility modifications are subject to the GHG PSD analysis.
40 Code of Federal Regulations (CFR) Part 98	This rule requires mandatory reporting of GHG emissions for facilities that emit more than 25,000 metric tons of CO_2 equivalent emissions per year. This requirement is triggered by this facility.
State	
California Global Warming Solutions Act of 2006, AB 32 (Stats. 2006; Chapter 488; Health and Safety Code sections 38500 et seq.)	This act requires the California Air Resource Board (ARB) to enact standards to reduce GHG emission to 1990 levels by 2020. Electricity production facilities will be regulated by the ARB. A cap-and-trade program became active in January 2012, with enforcement beginning in January 2013. Cap-and-trade is expected to achieve approximately 20 percent of the GHG reductions expected under AB 32 by 2020.
California Code of Regulations, Title 17, Subchapter 10, Article 2, sections 95100 et. seq.	These ARB regulations implement mandatory GHG emissions reporting as part of the California Global Warming Solutions Act of 2006 (Stats. 2006; Chapter 488; Health and Safety Code sections 38500 et seq.)
Title 20, California Code of Regulations, Section 2900 et seq.; CPUC Decision D0701039 in proceeding R0604009	The regulations prohibit utilities from entering into long-term contracts with any base load facility that does not meet a greenhouse gas emission standard of 0.5 metric tonnes carbon dioxide per megawatt-hour (0.5 $MTCO_2$/MWh) or 1,100 pounds carbon dioxide per megawatt-hour (1,100 lbs CO_2/MWh).
Local	
Rule 1714 – Prevention of Significant Deterioration for Greenhouse Gases, Gas Turbines	This rule establishes preconstruction review requirements for greenhouse gases (GHG). This rule is consistent with federal PSD rule as defined in 40 CFR Part 52.21. This rule requires the owner or operator of a new major source or a major modification to obtain a PSD permit prior to commencing construction.

AIR QUALITY GHG ANALYSIS

California is actively pursuing policies to reduce GHG emissions that include adding low-GHG emitting renewable electricity generation resources to the system. The GHGs evaluated in this analysis include carbon dioxide (CO_2), nitrous oxide (N_2O), methane (CH_4), sulfur hexafluoride (SF_6), hydrofluorocarbons (HFC), and perflurocarbons (PFC). CO_2 emissions are far and away the most common of these emissions; as a result, even though the other GHGs may have a greater impact on climate change on a per-unit basis due to their greater global warming potential as described more fully below, GHG emissions are often "normalized" in terms of metric tons of CO_2-equivalent (MTCO2E) for simplicity. Global warming potential (GWP) is a relative measure, compared to carbon dioxide, of a compound's ability to warm the planet, taking into account each compound's expected residence time in the atmosphere. By convention, carbon dioxide is assigned a global warming potential of one. In comparison, for example methane has a GWP of 21, which means that it has a global warming effect 21 times greater than carbon dioxide on an equal-mass basis. The carbon dioxide equivalent (CO2E) for a source is obtained by multiplying each GHG by its GWP and then adding the results together to obtain a single, combined emission rate representing all GHGs in terms of CO2E.

GHG emissions are not included in the class of pollutants traditionally called "criteria pollutants." Since the impact of the GHG emissions from a power plant's operation has global rather than local effects, those impacts should be assessed not only by analysis of the plant's emissions, but also in the context of the operation of the entire electricity system of which the plant is an integrated part. Furthermore, the impact of the GHG emissions from a power plant's operation should be analyzed in the context of applicable GHG laws and policies, especially Assembly Bill (AB) 32, California's Global Warming Solutions Act of 2006.

GLOBAL CLIMATE CHANGE AND CALIFORNIA

Worldwide, with the exception of 1998, over the past 132-year record the nine warmest years all have occurred since 2000, with the two hottest years on record being 2010 and 2005 (NASA 2013). According to "The Future Is Now: An Update on Climate Change Science Impacts and Response Options for California," an Energy Commission document, the American West is heating up faster than other regions of the United States (CEC 2009c). The California Climate Change Center (CCCC) reports that, by the end of this century, average global surface temperatures could rise by 4.7°F to 10.5°F due to increased GHG emissions.

The accumulation of GHGs in the atmosphere regulates the earth's temperature. Without these natural GHGs, the earth's surface would be approximately 61°F (34°C) cooler (CalEPA 2006); however, emissions from fossil fuel combustion for activities such as electricity production and vehicular transportation have elevated the concentration of GHGs in the atmosphere above natural levels. California Air Resources Board (ARB) estimated that the mobile source sector accounted for approximately 38 percent of the GHG emissions generated in California in 2009, while the electricity generating sector accounted for approximately 23 percent of the 2009 California GHG emissions inventory with just more than half of that from in-state generation sources (ARB 2011).

The Fourth U.S. Climate Action Report concluded, in assessing current trends, that CO_2 emissions increased by 20 percent from 1990 to 2004, while methane and nitrous oxide emissions decreased by 10 percent and 2 percent, respectively. The Intergovernmental Panel on Climate Change (IPCC) constructed several emission trajectories of GHGs needed to stabilize global temperatures and climate change impacts. It concluded that stabilization of GHGs at 450 ppm carbon dioxide equivalent concentration is required to keep the global mean warming increase below 3.8°F (2.1°C) from year 2000 base line levels (IPCC 2007a).

GHGs differ from criteria pollutants in that GHG emissions from a specific project do not cause direct adverse localized human health effects. Rather, the direct environmental effect of GHG emissions is the cumulative effect of an overall increase in global temperatures, which in turn has numerous indirect effects on the environment and humans. The impacts of climate change include potential physical, economic and social effects. These effects could include inundation of settled areas near the coast from rises in sea level associated with melting of land-based glacial ice sheets, exposure to more frequent and powerful climate events, and changes in suitability of certain areas for agriculture, reduction in Arctic sea ice, thawing permafrost, later freezing and earlier break-up of ice on rivers and lakes, a lengthened growing season, shifts in plant and animal ranges, earlier flowering of trees, and a substantial reduction in winter snowpack (IPCC 2007b). For example, current estimates include a 70 to 90 percent reduction in snow pack in the Sierra Nevada mountain range. Current data suggests that in the next 25 years, in every season of the year, California could experience unprecedented heat, longer and more extreme heat waves, greater intensity and frequency of heat waves, and longer dry periods. More specifically, the CCCC predicted that California could witness the following events (CCCC 2006):

- Temperature rises between 3 and 10.5 ºF
- 6 to 20 inches or greater rise in sea level
- 2 to 4 times as many heat-wave days in major urban centers
- 2 to 6 times as many heat-related deaths in major urban centers
- 1 to 1.5 times more critically dry years
- Losses to mountaintop snowpack and water supply (e.g., according to the CCCC, Sierra Nevada snowpack could be reduced by as much as 70 to 90 percent by 2100 [CEC 2009c])
- 25 to 85 percent increase in days conducive to ozone formation
- 3 to 20 percent increase in electricity demand
- 10 to 55 percent increase in the risk of wildfires

There is general scientific consensus that climate change is occurring and that human activity contributes in some measure (perhaps substantially) to that change. Man-made emissions of GHGs, if not sufficiently curtailed, are likely to contribute further to continued increases in global temperatures. Indeed, the California Legislature found that "[g]lobal warming poses a serious threat to the economic well-being, public health, natural resources, and the environment of California" (Cal. Health & Safety Code, sec. 38500, division 25.5, part 1).

The state has demonstrated a clear willingness to address global climate change (GCC) through research, adaptation[6], and GHG emission reductions. In that context, staff evaluates the GHG emissions from the proposed project, presents information on GHG emissions related to electricity generation (see **CALIFORNIA ELECTRICITY AND GREENHOUSE GASES** below), and describes the applicable GHG policies and programs.

In April 2007, the U.S. Supreme Court held that GHG emissions are pollutants within the meaning of the CAA. In reaching its decision, the Court also acknowledged that climate change results, in part, from anthropogenic causes (Massachusetts et al. v. Environmental Protection Agency 549 U.S. 497, 2007). The Supreme Court's ruling paved the way for the regulation of GHG emissions by U.S. Environmental Protection Agency (U.S. EPA) under the CAA.

In response to this Supreme Court decision, on December 7, 2009 the U.S. EPA Administrator signed two distinct findings regarding GHGs under Section 202(a) of the CAA:

- Endangerment Finding:[7] That the current and projected concentrations of the GHGs in the atmosphere threaten the public health and welfare of current and future generations; and
- Cause or Contribute Finding: That the combined emissions of GHGs from new motor vehicles and new motor vehicle engines contribute to the GHG pollution which threatens public health and welfare.

As a result, regulating GHGs at the federal level is now required by U.S. EPA's Prevention of Significant Deterioration Program (PSD) for sources that exceed 100,000 tons per year of carbon dioxide-equivalent emissions and federal rules require federal reporting of GHGs. As federal rulemaking evolves, staff at this time focuses on analyzing the ability of the project to comply with existing federal- and state-level policies and programs for GHGs.

[6] While working to understand and reverse global climate change, it is prudent to also adapt to potential changes in the state's climate (for example, changing rainfall patterns).
[7] The Supreme Court is expected to once again review the endangerment finding in early 2014, according to an article published online October 15, 2013 by E & E Publishing.

In 1998, the Energy Commission identified a range of strategies to prepare for an uncertain climate future, including a need to account for the environmental impacts associated with energy production, planning, and procurement (CEC 1998, p. 5). In 2003, the Energy Commission recommended that the state require reporting of GHGs or global climate change[8] emissions as a condition of state licensing of new electric generating facilities (CEC 2003, IEPR p. 42). In 2006, California enacted the California Global Warming Solutions Act of 2006 (AB 32). It requires the ARB to adopt standards that will reduce 2020 statewide GHG emissions to 1990 levels.

AB 32 includes a number of specific requirements:

ARB shall prepare and approve a scoping plan for achieving the maximum technologically feasible and cost-effective reductions in greenhouse gas emissions from sources or categories of sources of greenhouse gases by 2020 (Health and Safety Code (HSC) §38561). The scoping plan, approved by the ARB on December 12, 2008, provides the outline for actions to reduce greenhouse gases in California. The approved scoping plan indicates how these emission reductions will be achieved from significant greenhouse gas sources via regulations, market mechanisms and other actions. In 2014, ARB will complete its five year update to the Scoping Plan, tracking progress towards the 2020 emission goals and proposing new measures as appropriate.

The adopted Scoping Plan anticipates that four-fifths of the planned reductions will come from cost-effective programs and regulations, with the remainder provided by economy-wide cap-and-trade. Measures which affect the electricity sector directly include a 33percent Renewable Portfolio Standard, alternative transportation fuels such as vehicle and ship electrification, building energy efficiency, and combined heat and power. Most of these measures have been implemented, such as Senate Bill X1 2 (Simitian, Chapter 1, Statutes of 2011-12) which established a firm goal requiring all retail providers have 33 percent of California's electricity supplies by renewable sources by 2020.

Identify the statewide level of greenhouse gas emissions in 1990 to serve as the emissions limit to be achieved by 2020 (HSC §38550). In December 2007, the ARB approved the 2020 emission limit of 427 million metric tons of carbon dioxide equivalent (MMTCO2E) of greenhouse gases. In 2013, ARB used EPA's updated information to re-calculate that level to 431 million metric tons.

[8] Global climate change is the result of greenhouse gases, or air emissions with global warming potentials, affecting the global energy balance and thereby the global climate of the planet. The terms greenhouse gases (GHGs) and global climate change (GCC) gases are used interchangeably.

Adopt a regulation requiring the mandatory reporting of greenhouse gas emissions (HSC §38530). In December 2007, the ARB adopted a regulation requiring the largest electric power generation and industrial sources to report and verify their greenhouse gas emissions. The reporting regulation serves as a solid foundation to determine greenhouse gas emissions and track future changes in emission levels. Facilities which emit more than 25,000 metric tons per year are covered. That includes most emitting power plants of five megawatts or larger. Reported emissions from individual facilities may be found on the Mandatory Reporting website, http://www.arb.ca.gov/cc/reporting/ghg-rep/reported-data/ghg-reports.htm.

Adopt a regulation that establishes a system of market-based declining annual aggregate emission limits for sources or categories of sources that emit greenhouse gas emissions, applicable from January 1, 2012, to December 31, 2020 (HSC §38562(c)). In 2011, the ARB adopted the cap-and-trade original regulation. Amendments are scheduled to be adopted in spring, 2014. The cap-and-trade program covers major sources of GHG emissions in the state such as refineries, power plants, industrial facilities, and transportation fuels. The cap-and-trade program includes an enforceable emissions cap that will decline over time. The state will distribute allowances, which are tradable permits, equal to the emissions allowed under the cap. Sources under the cap will need to surrender allowances and offsets equal to their emissions at the end of each compliance period.

Individual in-state generating facilities and the first deliverers of imported electricity are the point of regulation. They are responsible for measuring their GHG emissions using ARB and U.S. EPA regulations, and purchasing either carbon allowances or offsets to meet their emissions obligation. Third party verification is required. If facilities find that it is not economic to operate and to purchase sufficient compliance instruments to cover its GHG obligations, facilities must lower their annual energy output. Further information on cap-and-trade may be found at http://www.arb.ca.gov/cc/capandtrade/capandtrade.htm.

The first mandatory compliance period[9] with cap-and-trade requirements commenced on January 1, 2012, although enforcement was delayed until January 2013.

[9] A compliance period is the time frame during which the compliance obligation is calculated. The years 2013 and 2014 are known as the first compliance period and the years 2015 to 2017 are known as the second compliance period. The third compliance period is from 2018 to 2020. At the end of each compliance period each facility will be required to turn in compliance instruments, including allowances and a limited number of ARB offset credits equivalent to their total GHG emissions throughout the compliance period. (http://www.arb.ca.gov/cc/capandtrade/guidance/chapter1.pdf)

Convene an Environmental Justice Advisory Committee (EJAC) to advise the Board in developing the Scoping Plan and any other pertinent matter in implementing AB 32 (HSC §38591). The EJAC met between 2007 and 2010, providing comments on the proposed early action measures and the development of the scoping plan, public health issues, and issues for impacted communities and cap-and-trade. To advise the ARB on the 2013 Scoping Plan Update, ARB reconvened a new EJAC on March 21, 2013. The committee met three times in 2013 and will continue in 2014 to provide advice to the ARB.

It is likely that GHG reductions mandated by ARB will be non-uniform or disproportional across emitting sectors, in that most reductions will be based on cost-effectiveness (i.e., the greatest GHG reduction for the least cost). For example, ARB proposes a 40 percent reduction in statewide GHG emissions from the electricity sector even though that sector currently only produces about 25 percent of the state's GHG emissions.

SB 1368,[10] enacted in 2006, and regulations adopted by the Energy Commission and the CPUC, pursuant to that bill, prohibits California utilities from entering into long-term commitments with any base load facilities that exceed the Emission Performance Standard (EPS) of 0.5 metric tonnes CO_2 per megawatt-hour[11] (1,100 pounds CO_2/MWh). Specifically, the SB 1368 EPS applies to base load power from new power plants, new investments in existing power plants, and new or renewed contracts with terms of five years or more, including contracts with power plants located outside of California.[12] If a project, instate or out of state, plans to sell base load electricity to California utilities, those utilities will have to demonstrate that the project meets the EPS. *Base load* units are defined as units that are expected to operate at a capacity factor higher than 60 percent. Compliance with the EPS is determined by dividing the annual average carbon dioxide emissions by the annual average net electricity production in MWh. This determination is based on capacity factors, heat rates, and corresponding emissions rates that reflect the *expected* operations of the power plant and not on full load heat rates [Chapter 11, Article 1 §2903(a)]. At the January 12, 2012, Business Meeting, the Energy Commission opened an Order Instituting Rulemaking (12-OIR-1) to consider revisions to the EPS.

HBEP is required to participate in California's GHG cap-and-trade program. This cap-and-trade program is part of a broad effort by the State of California to reduce GHG emissions as required by AB 32, which is being implemented by ARB. As currently implemented, market participants such as HBEP are required to report their GHG emissions and to obtain GHG emissions allowances (and offsets) for those reported emissions by purchasing allowances from the capped market and offsets from outside the AB 32 program. As new participants enter the market and as the market cap is ratcheted down over time, GHG emission allowance and offset prices will increase encouraging innovation by market participants to reduce their GHG emissions. Thus, HBEP, as a GHG cap-and-trade participant, would be consistent

[10] Public Utilities Code § 8340 et seq.
[11] The Emission Performance Standard only applies to carbon dioxide and does not include emissions of other greenhouse gases converted to carbon dioxide equivalent.
[12] See Rule at http://www.cpuc.ca.gov/PUBLISHED/FINAL_DECISION/64072.htm

with California’s landmark AB 32 Program, which is a statewide program coordinated with a region wide WCI program to reduce California’s GHG emissions to 1990 levels by 2020.

On January 8, 2014, in the Federal Register the US EPA proposed New Source Performance Standard (NSPS) for GHG emissions for new electric power plants (Federal Register, Volume 79, No. 5); the requirement is effective on the date of publication unless it is significantly revised. This new requirement would limit large natural gas-fired stationary combustion turbines to no more than 1,000 lbs CO_2 per MWh and small natural gas-fired stationary combustion turbines to no more than 1,100 lbs CO_2 per MWh. Large natural gas-fired stationary combustion turbines are those with heat input ratings greater than 850 MMBtu/h (approximately 100 MWe) and small natural gas-fired stationary combustion turbines are those with heat input ratings less than 850 MMBtu/h. According to U.S. EPA, the proposed NSPS limits apply to an electric generating unit if it supplies more than one-third of its potential electric output and more than 219,000 MWh net electric output to the grid per year.

The proposed combined cycle turbines are expected to be able to comply with these new federal requirements but they may have to limit their operations somewhat to do so. Tables F.6 through F.8 on page 117 of the revised PDOC show the facility’s total output in kilowatts (KW) from one power block and the corresponding net heat rate in higher heating values (HHV). A heat rate of 8,463 Btu per KWh (HHV) corresponds to a carbon dioxide emissions rate of 1,000 pounds of carbon dioxide per MWh. Under the new NSPS, the facility is likely to exceed the limit when operating in a one-on-one configuration (one combustion turbine plus steam turbine) with the combustion turbine operating at less than about 90 percent load (corresponds to 144,285 KW from the facility) given the listed heat rate of 8,436 Btu/KWh at that load point. It is also likely to exceed the limit below about 80 percent turbine power (268,702 KW in a two-on-one configuration and 367,918 KW in a three-on-one configuration) with listed heat rates of 8,346 Btu/KWh for the two-on-one configuration and 8,449 for the three-on-one configuration. Therefore, the project should keep operating above these load points in order to comply with the NSPS. If the project needs to operate below these load points for short periods, more operations at higher loads are required to keep the emission rates on a 12-operating month rolling average below the NSPS limit.

ELECTRICITY PROJECTED GREENHOUSE GAS EMISSIONS

While electricity use can be as simple as turning on a switch to operate a light or fan, the system to deliver the adequate and reliable electricity supply is complex and variable. But it operates as an integrated whole to reliably and effectively meet demand, such that the dispatch of a new source of generation unavoidably curtails or displaces one or more less efficient or less competitive existing sources. Within the system, generation resources provide electricity, or energy, generating capacity, and ancillary services to stabilize the system and facilitate electricity delivery, or movement, over the grid. *Capacity* is the instantaneous output of a resource, in megawatts. *Energy* is the capacity output over a unit of time, for example an hour or year, generally reported as megawatt-hours or gigawatt-hours (GWh). Ancillary services[13] include regulation, spinning reserve, non-spinning reserve, voltage support, and black start capability. Individual generation resources can be built and operated to provide only one specific service. Alternatively, a resource may be able to provide one or all of these services, depending on its design and constantly changing system needs and operations.

GHG EMISSIONS FROM THE PROPOSED FACILITY

Project Construction

Construction of industrial facilities such as power plants requires coordination of numerous equipment and personnel. The concentrated on-site activities result in temporary, unavoidable increases in vehicle and equipment emissions that include greenhouse gases. Construction of the HBEP project would involve 90 months of activity (not including start-up or commissioning). The project owner provided annual GHG emission estimate for the construction phase. The GHG emissions estimate is presented below in **Greenhouse Gas Table 2**. The term CO_2e represents the total GHG emissions after weighting by the appropriate global warming potential

Greenhouse Gas Table 2
HBEP, Estimated Maximum Annual Construction Greenhouse Gas Emissions

	CO_2	CH_4	N_2O	CO_2e
Construction Total (Metric Tons)	2,938	0.14	0.06	2,960

Source: HBEP 2014e

Project Operations

The HBEP is a proposed natural-gas fired, combined-cycle, air-cooled, 939-megawatt (MW) electrical generating facility that will replace the existing Huntington Beach Generating Station. The proposed HBEP would consist of two three-on-one combined-cycle power blocks, with three Mitsubishi Power Systems Americas (MPSA) 501DA combustion turbine generators (CTG) and associated equipment in each block. The primary sources of GHG would be the natural gas fired combustion turbines. The employee and delivery traffic GHG emissions from off-site activities are negligible in comparison with the gas turbine GHG emissions.

Greenhouse Gas Table 3 shows estimated actual annual emissions including all operations. All emissions are converted to CO_2-equivalent and totaled. Electricity generation GHG emissions are generally dominated by CO_2 emissions from the carbon-based fuels; other sources of GHG are typically small and also are more likely to be easily controlled or reused/recycled, but are nevertheless documented here as some of the compounds have very high relative global warming potentials.

[13] See CEC 2009b, page 95.

The applicant provided data on the expected heat rates for different load scenarios and different configurations. For each configuration (1x1, 2x1, and 3x1), the applicant provided heat rates for 5 different power outputs ranging from about 50-60 percent load up to 100 percent load. The applicant also provided the expected number of hours the plant would operate under each scenario, and heat rates for start ups and shutdowns. As a multi-stage generating facility, the HBEP is subject to SB1368 Emission Performance Standard of 60 percent capacity factor. Therefore, the project must comply with the SB1368 Greenhouse Gas Emission Performance Standard of 0.500 MTCO2/MWh. The estimated annual GHG performance is 1,053.7 lb CO2e/net MWh, or 0.479 MTCO2e/MWh, which could meet the standard. On January 8, 2014, US EPA proposed New Source Performance Standard (NSPS) for GHG emissions, which is no more than 1,000 lbs CO_2 per MWh for large natural gas-fired stationary combustion turbines with heat input ratings greater than 850 MMBtu/h. The federal NSPS is equivalent to 0.454 $MTCO_2$ per MWh. The rule is currently in draft form and during the public comments period. Once the rule is finalized, HBEP may be required to limit its operation profile in order to meet federal GHG NSPS.

.Greenhouse Gas Table 3
HBEP, Estimated Potential Greenhouse Gas (GHG) Emissions

Emissions Source	Operational GHG Emissions ($MTCO_2$/MWh) [a]
Total Project GHG Emissions (MTCO2/yr)	1,997,634
Estimated Annual Energy Output (MWh/yr) [b]	4,170,821
Estimated Annualized GHG Performance ($MTCO_2$/MWh)	0.479

Sources: SCAQMD 2014a
Notes: a. One metric tonne (MT) equals 1.1 short tons or 2,204.6 pounds or 1,000 kilograms.
b. Annualized basis uses the project owner's estimated actual operating basis.

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

Staff assesses the cumulative effects of GHG emissions caused by both construction and operation. As the name implies, construction impacts result from the emissions occurring during the construction of the project. The operation impacts result from the emissions of the proposed project during operation. Staff is continuing to monitor development of AB 32 Scoping Plan implementation efforts and general trends and developments affecting GHG regulation in the construction and electricity sectors.

CONSTRUCTION IMPACTS

Staff believes that the small GHG emission increases from construction activities would not be significant for several reasons. First, the intermittent emissions during the construction phase are not ongoing during the life of the project. Additionally, control measures that staff recommends to address criteria pollutant emissions, such as limiting idling times and requiring, as appropriate, equipment that meets the latest criteria pollutant emissions standards, would further minimize greenhouse gas emissions to the extent feasible. The use of newer equipment will increase efficiency and reduce GHG emissions and be compatible with low-carbon fuel (e.g., bio-diesel and ethanol) mandates that will likely be part of future ARB regulations to reduce GHG from construction vehicles and equipment.

DIRECT/INDIRECT OPERATION IMPACTS AND MITIGATION

Operational impacts of the proposed project are described in detail in a later section titled "**CALIFORNIA ELECTRICITY AND GREENHOUSE GASES**" since the evaluation of these effects must be done by considering the project's role(s) in the integrated electricity system. In summary, these effects include reducing the operation and greenhouse gas emissions from the older, existing power plants; potentially displacing local electricity generation; the penetration of renewable resources; and accelerating generation retirements and replacements, including facilities currently using once-through cooling.

CUMUMATIVE IMPACTS

Cumulative impacts are defined as "two or more individual effects which, when considered together, are considerable or . . . compound or increase other environmental impacts" (CEQA Guidelines § 15355). "A cumulative impact consists of an impact that is created as a result of a combination of the project evaluated in the EIR together with other projects causing related impacts" (CEQA Guidelines § 15130[a][1]). Such impacts may be relatively minor and incremental, yet still be significant because of the existing environmental background, particularly when one considers other closely related past, present, and reasonably foreseeable future projects.

This entire assessment is a cumulative impact assessment. The project alone would not be sufficient to change global climate, but would emit greenhouse gases and therefore has been analyzed as a potential cumulative impact in the context of existing GHG regulatory requirements and GHG energy policies.

COMPLIANCE WITH LORS

HBEP is required to participate in California's GHG cap-and-trade program, which became active in January 2012, with enforcement beginning in January 2013. This cap-and-trade program is part of a broad effort by the State of California to reduce GHG emissions as required by AB 32, which is being implemented by ARB. As currently implemented, market participants such as HBEP are required to report their GHG emissions and to obtain GHG emissions allowances (and offsets) for those reported emissions by purchasing allowances from the capped market and offsets from outside the AB 32 program. HBEP, as a GHG cap-and-trade participant, would be consistent with California's landmark AB 32 Program, which is a statewide program coordinated with a region wide WCI program to reduce California's GHG emissions to 1990 levels by 2020. ARB staff continues to develop and implement regulations to refine key elements of the GHG reduction measures to improve their linkage with other GHG reduction programs. The project may have to provide additional reports and GHG reductions, depending on the future regulations expected from ARB. Similarly, the proposed facility modifications would be subject to federal mandatory reporting of GHG emissions.

Reporting of GHG emissions would enable the project to demonstrate consistency with the policies described above and the regulations that ARB adopts and to provide the information to demonstrate compliance with any future AB 32 requirements that could be enacted in the next few years.

The HBEP as proposed would comply with California's Emissions Performance Standard of 1,100 lbs of carbon dioxide per MWh, but may have to restrict operations somewhat to comply with the new federal NSPS of 1,000 lbs carbon dioxide per MWh.

District Regulation XVII establishes preconstruction review requirements for GHGs and the facility is evaluated for these requirements in the revised PDOC beginning on page 43. HBEP would be a major PSD source. The district performed a PSD BACT analysis for GHGs and concluded thermal efficiency is the only technically and economically feasible alternative for CO_2/GHG emissions control for the facility. The current design proposed for the facility meets the BACT requirement for GHG emission reductions. The District determined that visibility modeling for PSD Class I areas was not required but did evaluate visibility impacts on PSD Class II areas. They found that the proposed project would not adversely affect visibility in the Class II areas analyzed.

CALIFORNIA ELECTRICITY AND GREENHOUSE GASES – DAVID VIDAVER

California's commitments to dramatically reduce greenhouse gas (GHG) emissions over the next four decades include moving to a high-renewable/low GHG electricity system. However, natural gas-fired power plants--and the GHG emissions associated with their output--will still be integral to the reliable operation of the electricity system at the outset of this period. In the long-run, zero- and low carbon resources, including demand-side and storage resources, may provide a majority, if not all of the balancing services needed to integrate variable[14] renewable resources. However, the technologies that are needed to do so are not expected to be available in sufficient quantities by the early- to mid-2020s to obviate the need for dispatchable, flexible natural gas-fired electricity generation. Furthermore, the 2017–2020 retirements of natural gas-fired generation resources in the Los Angeles and San Diego regions that use once through cooling (OTC) technologies and the closure of the San Onofre Nuclear Generating Station (SONGS) will require the development of natural gas-fired generation as part of the set of resources that will maintain local reliability.

The amount of new natural gas-fired capacity needed to provide reliable service to the customers of the state's investor-owned utilities, direct access providers and community choice aggregators over a ten-year planning horizon is determined in the California Public Utilities Commission's (CPUC's) Long-term Procurement Planning (LTPP) proceeding. The resulting portfolio of demand- and supply-side resources satisfies the state's loading order, which mandates development of cost-effective preferred resources (zero- and low-GHG emitting resources, such as energy efficiency, demand response, and renewable generation) in support of the state's climate change policies before authorizing the development/financing of conventional fossil resources.[15]

[14] Variable and intermittent are often used interchangeably, but variable more accurately reflects the integration issues of renewable into the California grid. Winds can slow across a wind farm or cloud cover can shade portions of a solar field, temporarily reducing unit or facility output, but not shut down the unit or facility.

[15] The loading order is set forth in California's Energy Action Plans. Energy Action Plan I was adopted by the state's energy agencies in April/May 2003 and Energy Action Plan II in September 2005, an update to these plans was issued in February 2008.

THE ROLE OF NATURAL GAS-FIRED GENERATION IN A LOW-GHG ENVIRONMENT

The need for natural gas-fired generation to reliably operate the electricity system is well established. On October 8, 2008, the Energy Commission adopted an Order Instituting Informational Proceeding (08-GHG OII-1) to solicit comments on how to assess the greenhouse gas impacts of proposed new power plants in accordance with the California Environmental Quality Act (CEQA).[16] A report prepared as a response to the GHG OII (CEC 2009a) defines the roles that natural gas-fired power plants fulfill in an evolving high-renewables, low-GHG system (CEC 2009b, pp 93 and 94). Such new facilities serve to:

1. Provide variable generation and grid operations support;

2. Meet extreme load and system emergency requirements;

3. Meet local capacity requirements; and,

4. Provide general energy support.

Variable Generation and Grid Operations Support

California's renewable portfolio standard (RPS) requires that the state's energy service providers meet 33 percent of retail sales with renewable energy by 2020; meeting GHG emission reduction targets for 2050 will likely require a far higher percentage. Much of this energy will come from variable wind and solar resources to be developed in California, or on an "as generated" basis from neighboring states.

The California Independent System Operator (CA ISO) has identified an increased need for regulation services, "load-following" generation, and multi-hour ramping as a result of the increase in these variable ("intermittent energy") renewable resources, whose output changes over the course of the day, often in a sudden and unpredictable fashion. Dispatchable capacity must provide "regulation," small changes in output over a 5-minute period at CA ISO direction, requiring that the generator be equipped with automated generation control (AGC). "Load following" requires larger changes in output by the generation portfolio over a 5-minute to one-hour period. Multi-hour ramping needs require that units be dispatched, at CA ISO direction if necessary, over time periods of one to nine hours and wider ranges of output in aggregate, requiring dispatchable generation that can start and ramp up and down quickly and be capable of operating at relatively low load levels if the amount of dispatchable capacity and associated energy needed from these resources is to be minimized.

[16] This need for gas-fired generation to reliably operate the system was reaffirmed in the CPUC decision authorizing Southern California Edison to procure new gas-fired generation in the Los Angeles Basin. D.13-02-015, See Decision Authorizing Long-Term Procurement for Local Capacity Requirements, February 13, 2013, p. 2.

Natural gas-fired power plants are currently the only type of new facility that can provide these "ancillary" services in the quantities needed now and in the near future. While dispatchable hydroelectric plants can also provide them, the potential for adding hydroelectric resources to the system is limited. Nuclear, coal and geothermal facilities are generally more economic if operated at or near their design point (ie, base loaded)[17] and therefore, not the preferred technology for providing ancillary services. While demand-side resources and storage may ultimately provide significant quantities of these ancillary services, only pumped hydro storage facilities are currently capable of doing so on a large scale.[18]

Historically, a large share of California's load-following and ramping needs have been provided by the natural gas-fired steam turbines built on the Pacific coast and in the San Francisco Bay Delta during the 1960s and 1970s. While these units were modified to operate successfully as load followers, they are not as efficient or economic as newer technologies. Several of these have retired as a result of the State Water Resource Control Board's (SWRCB's) policy on the use of OTC technologies; others are expected to retire by 2020. This represents a loss of capacity capable of operating at a very wide range of output and thus provides large quantities of ancillary services.

Local Capacity Requirements

The CA ISO has identified numerous local capacity areas (LCA) and sub-areas in which threshold amounts of capacity are required to ensure reliability. Transmission constraints prevent the import of sufficient energy into these areas under high load conditions to ensure reliable service without requiring specified amounts of capacity be generating or available to the CA ISO for immediate dispatch.

Reliable service requires that the CA ISO be able to maintain service under 1-in-10-year load conditions given the sequential failure of two major components (a large power plant and a major transmission line, for example); this requirement is imposed by the North American Electric Reliability Council (NERC). The amount of capacity needed in each of these areas (the local capacity requirement, or "LCR") is determined annually by the CA ISO; the LCR study process culminates in an annual *Local Capacity Technical Analysis*. The need for natural-gas fired capacity in LCAs stems in part from their predominantly urban nature and coastal location (i.e., fewer transmission lines into the coastal region as none are available from the west or ocean-side of the basin). The LCRs of the Greater Bay Area, Los Angeles Basin, San Diego and Big Creek-Ventura LRAs are too large to be met solely with non-natural gas fired generation; the renewable development scenarios compiled by the CPUC for use in the 2012 LTPP proceeding – and those being considered in the 2014 proceeding – indicate that only a share of the new capacity needed in the large LCAs can be expected to come from new renewable resources. This share is not sufficient to eliminate the need for new natural-gas fired

[17] Issues can arise from: thermal fatigue due to cycling; difficulties starting and stopping solid or geothermal fuel supplies; significant inefficiencies at low loads or standby points used to avoid full shutdowns; and, significant capital outlays that make it necessary to operate the units as much as possible.

[18] In D.13-02-015, the CPUC provides the assumptions regarding demand response and storage that were used in estimating the residual need for gas-fired generation capacity to meet the estimated 2021 local capacity requirement (LCR) for the Los Angeles Basin local capacity area (LCA).

generation in the Los Angeles Basin LCA, as evidenced by the procurement authorization issued in that proceeding.

Extreme Load and System Emergency Requirements

Sufficient capacity must exist to meet demand under very high load conditions or when generator outages reduce capacity surpluses to levels low enough to threaten reliability. Historically, generation capacity and demand response programs equal to 115 percent to 117 percent of forecasted annual peak demand have been deemed sufficient to meet reliability requirements.

General Energy Support

The loading order indicates the resources that the state intends to rely on to meet energy needs while reducing GHG emissions. While energy efficiency, demand response programs, renewable generation, and combined heat and power are preferred resources that are to be developed before natural gas-fired generation, they are not sufficient to meet the state's future energy demand and maintain the electric system's reliability. In addition, a significant share of the state's still-operating generation fleet is expected to shut down to comply with the SWRCB's OTC policy. Energy from natural gas-fired generation will increasingly be needed during a prolonged nuclear plant outage (for refueling for example) or during dry years, in which hydroelectric production is reduced.

QUANTIFYING THE NEED FOR NATURAL GAS-FIRED GENERATION

Prior to the deregulation of the California electricity system during the 1990's, the Energy Commission's power plant siting process considered the need for power plant development. SB 110 (Chapter 581, Statutes of 1999) eliminated the requirement that projects licensed by the Energy Commission be in conformance with an integrated assessment of need that was conducted by the Energy Commission until that time.

The need for new generation capacity to ensure reliable service in the investor-owned utility (IOU) service territories is now determined in the CPUC's biennial LTPP proceeding.[19] This proceeding is the forum in which the state's major IOUs are authorized to finance the development of new "least-cost, best-fit" generation (on behalf of either IOU customers or all ratepayers not served by publicly-owned utilities) needed to reliably meet electricity demand. This need, specified in terms of: (a) the MW of capacity needed; (b) the desired or required operating characteristics of the resource(s) to be financed; and (c) the location of proposed additions if required for local reliability, is a function of planning assumptions that reflect the state's commitment to dramatically reduce GHG emissions from the electricity sector. The MWs of capacity needed are driven by:

[19] The need for new generation capacity to ensure reliable service by publicly-owned utilities (POU) is determined by the governing authorities of the individual utilities.

- Peak demand growth due to economic and demographic factors;
- Reductions in peak demand due to committed and uncommitted energy efficiency and demand response programs;
- Reserve margins (dependable capacity in excess of peak demand) needed to ensure system reliability, normally assumed to be 15 to 17 percent of peak demand, but also including any additional dispatchable capacity needed to ensure reliability given variation of renewable resources (e.g., wind or solar generation);
- Capacity to be provided by fossil-fired resources being developed by California-based investor-owned utilities pursuant to authorization by the CPUC in previous LTPP proceedings;
- Capacity to be provided by new renewable resources built/contracted with to meet the state's RPS; and,
- Capacity to be lost due to retirement, e.g., capacity expected to cease operation as a result of the SWRCB policy regarding the use of OTC.

The planning assumptions adopted for use in the LTPP proceeding, and thus determinant of the amount of new capacity authorized, consider both the state's "loading order" for resource development, as well as the expected development of specific types of preferred resources, including energy efficiency, demand response, and renewable generation. In other words, in authorizing the procurement/financing of dispatchable, natural gas-fired capacity by an IOU, the CPUC assumes that cost-effective amounts of preferred resources will have been procured.[20]

The authorization for Southern California Edison to procure natural gas-fired generation to meet local reliability needs in the Los Angeles Basin was granted in D.13-02-015 (February 13, 2013) in the CPUC's 2012 LTPP proceeding (R.12-03-014). The decision requires that Southern California Edison procure at least 1,000 MW and not more than 1,200 MW of new conventional natural gas-fired resources in order to replace in-basin capacity utilizing OTC expected to retire by the end of 2020. The decision did not consider any need for additional capacity as a result of the retirement of San Onofre.

The CPUC does not require Energy Commission certification for a generation project to participate in a utility request for offers (RFOs), nor does the Energy Commission require a PPA for a project to be considered for certification. Requiring the sequencing of these processes would not only lengthen the time needed to bring projects on line and thus threaten system reliability, it would reduce the number of projects that could compete in utility RFOs. This could lead to non-competitive solicitations, unnecessarily raising ratepayer costs.

[20] Both the amount of natural gas-fired capacity conditionally authorized by the CPUC and the amount that will ultimately approved are dependent upon the amount of preferred resources that are assumed by the CPUC to be developed and a showing by the IOU that all cost-effective preferred resources available have been procured. See D.13-02-015, pp. 78 - 80

Energy Commission certification of fossil generation without a long-term PPA does not result in the development of more fossil generation than that needed to reliably operate the system. It is not expected that developers of new capacity, such as the developer of the proposed modified ESEC facility, would bring a project to completion without a long-term PPA with a utility that would guaranteed recovery of the investment of several hundred million dollars. Only one so-called “merchant plant” has been developed since the energy crisis (2000 – 2001) without a PPA, and the conditions that led to that merchant plant are specific to that one facility. This merchant plant, in turn, provides capacity and ancillary services that obviates the need for energy and capacity from other, new gas-fired generation and contributes to reduction in GHG emissions. However, if the new ESEC units were to be built and come on line without CPUC approval of a PPA, they would still: (a) displace energy from higher GHG-emission facilities, and (b) not “crowd out” renewable generation and demand-side programs (i.e., requirements/targets for the procurement of preferred resources will be unaffected).

ENERGY DISPLACEMENT AND CHANGES IN GHG EMISSIONS

Any assessment of the impact of a new power plant on system-wide GHG emissions must begin with the understanding that electricity generation and demand must be in balance at all times; the energy provided by any new generation resource simultaneously displaces exactly the same amount of energy from an existing resource or resources.[21] The GHG emissions produced by the HBEP are thus not incremental, but are partially or totally offset by reductions in GHG emissions from those generation resources that are displaced, depending on the relative GHG emission rates.

At renewable penetration levels of less than 33 percent, new natural gas-fired generation such as the modified ESEC facility displaces less efficient natural gas-fired generation[22] in a very straightforward fashion. It is reasonable to assume that the HBEP units would be dispatched (called upon to generate electricity) whenever they are a cheaper source of energy than an alternative - i.e., that they will displace a more expensive resource, if not the most expensive resource that would otherwise be called upon to operate. The costs of dispatching a power plant are largely the costs of fuel, plus variable operations and maintenance (O&M) costs, with the former representing the lion’s share of such costs (90 percent or more). It follows that the new HBEP units would be dispatched when they burn less fuel per MWh than the resource(s) they displace, i.e., when they produce fewer GHG emissions. There are exceptions in theory, but not in practice.[23]

[21] Over time, the development of demand-side and storage technologies that can cost-effectively substitute for generation as providers of regulation, load-following, and multi-hour ramping services may obviate the need for gas-fired generation, but this is not expected to occur soon enough to eliminate the need for gas-fired generation to replace retiring OTC units and San Onofre.

[22] At very low gas prices relative to coal prices, i.e., when electricity from natural gas is cheaper than that from coal, new gas-fired generation will displace coal-fired generation. In markets such as California, where GHG emissions allowance costs are a component of the market price, coal-fired generation is displaced even sooner due to its higher carbon content.

[23] If a plant’s variable O&M costs are so low as to offset the costs associated with its greater fuel combustion, a less efficient (higher GHG emission) plant may be dispatched first. There is no indication that the HBEP’s’ variable O&M costs are unusually low and that they would be dispatched before a more efficient facility. If a natural gas-fired plant’s per-mmBtu fuel costs are very low, it may be less efficient

Holding the portfolio of generation resources constant, energy from new natural gas-fired plants displaces energy from existing natural gas-fired plants. In the longer-term, the development and operation of the HBEP would reduce the use of less efficient generation resources, and ultimately, to their retirement. By reducing revenue streams accruing to other resources (for the provision of both energy and capacity-related services, whether through markets or under a bilateral contract), the HBEP render these other facilities less profitable and riskier to operate. This follows from the fixed demand for energy and ancillary services; the developers of the HBEP cannot stimulate demand for energy and other products they provide, but merely serve to provide a share of the energy that is needed to meet demand and the capacity needed to reliably operate the system. In doing so, the HBEP both discourages the use of, and allows for the retirement of less-efficient generation.

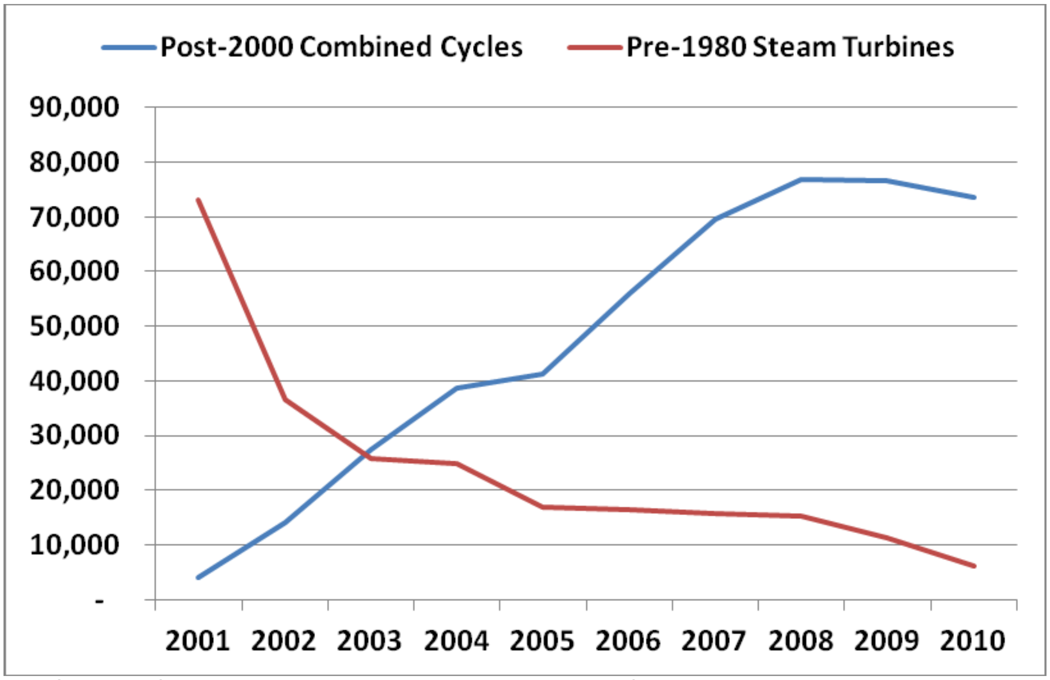
The long-run impact of the natural gas fired fleet turnover as described here can be seen from historical changes in resources that are providing electricity in California as presented below in **Figure GHG-1** (data includes combined cycles and boilers only). In 2001, approximately 74,000 GWh (62.5 percent of natural gas-fired generation) in California was from pre-1980 natural gas fired steam turbines, combusting an average of 11,268 Btu per kWh (not shown in the figure). By 2010, this share had fallen to approximately 6,000 GWh (5.4 percent); 64.1 percent of natural-gas fired generation was from new combined cycles with an average heat rate of 7,201 Btu per kWh (CEC 2011, also not shown in the figure).[24] The net change over this period was a 22 percent reduction in GHG emissions (also not shown in the figure) despite a 3.5 percent increase in generation. The post-2000 development of new combined cycle generation has allowed for the retirement of aging natural gas fired steam turbines along the California Coast and in the San Francisco Bay Delta. Those that remain in operation have seen a dramatic reduction in their capacity factors[25] and are used primarily as a source of dispatchable capacity.

(higher GHG emission) but still be dispatched first. Natural gas costs in California, however, are higher than elsewhere in the WECC and thus this scenario is unlikely to occur.

[24] The remaining 30 percent of natural-gas-fired generation is largely cogeneration; slightly more than one percent is from peaking units. For a detailed discussion of the evolution of natural gas-fired generation in California since 2000, see *Thermal Efficiency of Gas-Fired Generation in California: 2012 Update* (CEC-200-2013-002; May 2013)

[25] A unit's capacity factor is its output expressed as a share of potential output, the amount it would generate if it were operated continuously at 100 percent.

Figure GHG-1 Annual California Output (GWh), Selected Natural Gas-Fired Generation Technologies, 2001 – 2010



Source: Generator Quarterly Fuel and Report Filings with the Energy Commission

The dispatch of the HBEP would generally not result in the displacement of energy from renewable resources or large hydroelectric generation. Most renewable resources have must-take contracts with utilities, which must purchase all the energy produced by these renewable generators. Rare exceptions occur due to transmission congestion or seasonal surpluses. Even in those instances where this is not the case (e.g., where renewable generation is participating in a spot market for energy) the variable costs associated with renewable generation are far lower than those associated with the HBEP (e.g., fuel costs for wind, solar, other renewable generation technologies, and large hydroelectric facilities are zero or minimal); these resources can bid into spot markets for energy at prices far below the HBEP and other natural gas-fired generators. Nor would the HBEP displace energy from operating (zero-GHG emission) nuclear generation facilities, as these resources have far lower variable operating costs as well.

The relationship between a natural gas-fired plant's heat rate and its dispatch in the real world is in fact more complicated than that described above. While natural gas-fired plants differ in their thermal efficiency – the amount of fuel combusted, and thus GHG emissions per unit of electricity generated – very efficient natural gas plants are not necessarily dispatched before less efficient ones. While this would seem to contradict the assertion that output from a new plant will always displace a higher emitting one, a less efficient (e.g., at full output) plant may actually combust less fuel during a duty cycle than a plant with a lower heat rate, and thus produce fewer GHG emissions. Consider a 30-MW peaking plant with a heat rate of 10,000 Btu/kWh when operated at full output whose electrical outputs can be moved from off to on, generating approximately 15 to 30 MW in a matter of minutes. Use of this plant to meet contingency needs (e.g., demand on a hot afternoon) may result in less incremental fuel combustion than a 100 MW plant with a lower heat rate at full output if the latter requires several hours and combusts large amounts of fuel to start up, must be kept on overnight or for several hours in order to be available the next day and/or cannot operate at 30 MW (without a marked degradation in efficiency, and thus increases in GHG emissions).

At levels of renewable energy penetration in excess of 33 percent, flexible combined cycles such as the HBEP contribute to GHG emission reductions by increasing the amount of renewable energy that can be integrated into the electricity system. Given the solar-intensive generation portfolio being developed in California, increasing renewable penetration without curtailing renewable output more often will require an increasing ability to export surplus generation, store energy over a multi-hour period, and/or reduce gas-fired generation needed to reliably operate the system.[26] While the HBEP units are less thermally efficient than the natural gas-fired combined cycles built in California during the past decade, they are capable of operating at lower levels of output, and doing so without a marked decrease in efficiency. As a result, they can allow for more renewable generation that a conventional combined cycle, with the concomitant reduction in GHG emissions serving to offset the impact of their lower efficiency.

THE ROLE OF THE HBEP IN LOCAL GENERATION DISPLACEMENT

As new generation capacity in the California ISO-defined Los Angeles Basin local capacity area (LCA) and its Western Los Angele sub-area (LCA), the proposed HBEP would provide local reliability services. The CA ISO has determined in their *2014 Local Capacity Technical Analysis* that the Los Angeles Basin and its Western sub-area need 10,430 MW and 4,175 MW of local capacity, respectively.[27] The HBEP facility would contribute up to 939 MW of local capacity to these areas; in D.13-02-015[28] the CPUC has established the need for local capacity in excess of this amount to replace retiring OTC capacity in the Los Angeles Basin LCA.

As stated above, local reliability requires generation by resources located within an LCA; the LCR reflects the amount of capacity that must be generating, synchronous to the grid or available within a few minutes under 1-in-10 load conditions.[29] At lower levels of demand, a share of local capacity must be generating, synchronous to the grid or available on a moment's notice as long as reliability cannot be maintained solely with imported energy in the event of major component failures.

[26] For a detailed discussion of the operational needs for a high-solar portfolio, see Energy and Environmental Economics, *Investigating a Higher Renewables Standard in California*, January 2014, available at http://www.ethree.com/public_projects/renewables_portfolio_standard.php.
[27] California ISO, *2014 Local Capacity Technical Analysis: Final Report and Study Results*, April 30, 2013, pp 75, 79.
[28] It is expected that the Energy Commission will receive AFCs from applicants expecting to provide additional local capacity well in excess of that authorized by [Decision #], as well as any additional amount authorized by forthcoming decisions in the 2014 LTPP proceeding. Approving AFCs for projects whose capacity in aggregate is in excess of that authorized by the CPUC facilitates competitive solicitations for new capacity and does not present a significant risk of the development of capacity in excess of the amount authorized;.
[29] 1-in-10 load conditions refer to a level of demand that is expected to be observed on only one day in ten years

The number of hours per year that the HBEP would be required to operate in support of local reliability needs and the amount of energy that would be generated as a result are not known; CA ISO operating procedures which result in the dispatch of specific generating units for local reliability purposes are confidential. When called upon to generate for such purposes, however, it is reasonable to expect that the HBEP would be the least-cost and thus lowest-emitting natural gas-fired resources able to do so, given the duty cycle that was necessary to provide local reliability. It would thus displace a less-efficient resource, reducing GHG emissions resulting from relying on the latter. Should it be dispatched for local reliability needs ahead of units that were thermally more efficient, it would likely be because, able to operate at lower levels of output, it would allow for the integration of a greater amount of renewable energy.

AVENAL PRECEDENT DECISION

The Energy Commission established a precedent decision in the Final Commission Decision for the Avenal Energy Project (CEC 2009b), finding as a conclusion of law that any new natural gas-fired power plant certified by the Energy Commission "must:

- not increase the overall system heat rate for natural gas plants;
- not interfere with generation from existing renewables or with the integration of new renewable generation; and
- take into account the two preceding factors, reduce system-wide GHG emissions"[30]

The average heat rate for the Western Electricity Coordinating Council (WECC) is presented in **Table GHG-**1.

Table GHG-1 Weighted Average Heat Rate for Operating Natural Gas-Fired Plants[1] in the WECC 2010-2012

Year	Average Heat Rate (mmBtu/kWh)
2010	7,784
2011	7,995
2012	7,918

[1] Excludes cogeneration facilities
Source: Ventyx, Velocity Suite (compiled from EPA hourly Continuous Emission Monitoring Survey data

Despite having a heat rate in excess of the WECC average, the operation of the HBEP should result in a reduction in the system heat rate for natural gas plants in the WECC due to its displacing energy from less-efficient natural gas-fired generation as discussed above. In those instances where HBEP is higher emitting on a per-MWh basis that the resources it displaces but does so because it can operate at lower output levels and thus allow for more renewable integration and generation, the result might be a higher system heat rate, but total gas-fired generation (energy) and GHG emissions will fall.

As noted above, the addition of HBEP would not interfere with generation from existing renewable facilities nor with the integration of new renewable generation. The flexible nature of the HBEP would in fact serve to facilitate the integration of additional variable renewable resources.

[30] Final Commission Decision, Avenal Energy Application for Certification (08-AFC-1) December 2009, p. 114.

The HBEP would reduce system-wide GHG emissions as discussed above; their development is consistent the goals and policies of AB 32 and thus are consistent with the Avenal precedent decision.

PROPOSED CONDITIONS OF CERTIFICATION – TAO JIANG

No Conditions of Certification related to greenhouse gas emissions are proposed. The facility owner would participate in California's GHG cap-and-trade program. The facility owner is required to report GHG emissions and to obtain GHG emissions allowances (and offsets) for those reported emissions by purchasing allowances from the capped market and offsets from outside the AB 32 program. Similarly, the proposed facility modifications would be subject to federal mandatory reporting of GHG emissions. The facility owner may have to provide additional reports and GHG reductions, depending on the future regulations formulated by the U.S. EPA or the ARB.

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ACRONYMS

AB	Assembly Bill
ARB	California Air Resources Board
CAA	Clean Air Act
CalEPA	California Environmental Protection Agency
Cal ISO	California Independent System Operator
CCCC	California Climate Change Center
CEC	California Energy Commission
CEQA	California Environmental Quality Act
CH_4	Methane
CO	Carbon Monoxide
CO_2	Carbon Dioxide
CO2E	Carbon Dioxide Equivalent
CPUC	California Public Utilities Commission
EIR	Environmental Impact Report
EPS	Emission Performance Standard
GCC	Global Climate Change
GHG	Green House Gas
GWh	Gigawatt-hour
GWP	Global Warming Potential
HBEP	Huntington Beach Energy Project
HFC	Hydrofluorocarbons
IEPR	Integrated Energy Policy Report
IGCC	Integrated Gasification Combined Cycle
IPCC	Intergovernmental Panel on Climate Change
KW	Kilowatt
LRAs	Local Reliability Areas
MT	Metric tones
MW	Megawatt
MWe	Megawatt electrical
MWh	Megawatt-hour
N_2O	Nitrous Oxide
NO	Nitric Oxide
NO_2	Nitrogen Dioxide
NO_3	Nitrates
NOx	Oxides of Nitrogen or Nitrogen Oxides

OII	Order Initiating an Informational
OTC	Once-Through Cooling
PFC	Perfluorocarbons
POU	Publicly Owner Utility
PSA	Preliminary Staff Assessment (this document)
PSD	Prevention of Significant Deterioration
QFER	Quarterly Fuel and Energy Report
RPS	Renewables Portfolio Standard
SB	Senate Bill
SCE	Southern California Edison
SF_6	Sulfur hexafluoride
SWRCB	State Water Resource Control Board
U.S. EPA	United States Environmental Protection Agency

BIOLOGICAL RESOURCES

Testimony of Heather Blair, Jennifer Lancaster, and Scott D. White

SUMMARY OF CONCLUSIONS

The proposed Huntington Beach Energy Project (HBEP) is a natural-gas-fired electrical generating facility that would replace, and be constructed on the site of, the existing Huntington Beach Generating Station, an operating power plant in Huntington Beach, California. The proposed power plant site and offsite laydown area at the Alamitos Generating Station are industrial sites and vegetation is limited to weedy species and landscaping. Rare plants and special-status wildlife are not expected to occur onsite; however, nearby marshes and other natural areas support special-status birds including the Belding's savannah sparrow (state-listed endangered), light-footed clapper rail (federally and state-listed endangered), western snowy plover (federally listed threatened), California least tern (federally and state-listed endangered), and California brown pelican (state fully protected). Another sensitive wildlife resource is the Wildlife Care Center, which houses rehabilitating birds and wildlife in open air enclosures approximately 25 feet southwest of the proposed HBEP site and the existing Huntington Beach Generating Station.

Given the proximity of the proposed project to the aforementioned biological resources, 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, compliance with the laws, ordinances, regulations, and standards listed in **Biological Resources Table 1** would be achieved and direct, indirect, and cumulative impacts would be avoided, minimized, or mitigated to less than significant levels (refer to **Biological Resources Table 4** in the subsection "Conclusions" below for a summary of the proposed project's impacts, applicable conditions of certification, and determination of significance).

INTRODUCTION

This section provides the California Energy Commission (Energy Commission) staff's analysis of potential impacts to biological resources from the construction, demolition, and operation of the proposed HBEP.

This analysis addresses potential impacts to special-status species, wetlands and other waters of the U.S., 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 compliance with applicable laws, ordinances, regulations, and standards (LORS).

This analysis is based, in part, on information provided in the HBEP Application for Certification (AFC; HBEP 2012a), Data Adequacy Supplement (HBEP 2012b), responses to staff and interveners data requests (HBEP 2012c; 2012d; 2013a; 2013b; 2013c; 2013o), staff's observations during site visits of the proposed HBEP on September 28, 2012 and September 17, 2013; discussion at the data response workshop on November 14, 2012, the PSA Part A workshop on November 20, 2013, and the PSA Part B and Focused Supplemental Analysis workshop on April 3, 2014; 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 applicant must comply with the LORS listed in **Biological Resources Table 1** during project construction, demolition, and operation.

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

Applicable LORS	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 USFWS and National Marine Fisheries Service.
Clean Water Act (Title 33, United States Code, sections 1251 through 1376, and Code of Federal Regulations, part 30, section 330.5(a)(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.
Migratory Bird Treaty (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.
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.
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.

Applicable LORS	Description
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.
Lake and Streambed Alteration Agreement (Fish and Game Code sections 1600 et seq.)	Regulates activities that may divert, obstruct, or change the natural flow or the bed, channel, or bank of any river, stream, or lake in California designated by CDFW in which there is at any time an existing fish or wildlife resource or from which these resources derive benefit. Impacts to vegetation and wildlife resulting from disturbances to waterways are also reviewed and regulated during the permitting process. The administering agency is CDFW.
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. Such actions may include: the control of run-off, minimization of discharge and entrainment, prevention of interference with surface water flow (and streams), prevention of groundwater depletion, use of wastewater reclamation, and maintenance of natural vegetation in buffer areas that protect riparian habitats. Section 30240 of the Coastal Act mandates protection of environmentally sensitive habitats from the degradation of habitat value. The administering agency is the California Coastal Commission.
California Food and Agriculture Code, section 403	The California Department of Food and Agriculture is the state agency designated to prevent the introduction and spread of injurious insect or animal pests, plant diseases, and noxious weeds.
Porter-Cologne Water Quality Control Act	Regulates discharges of waste and fill materials to waters of the state, including "isolated" waters and wetlands.
Local	
City of Huntington Beach General Plan/Local Coastal Program/Coastal Element	The Conservation and Open Space and Land Use Elements of the General Plan direct the city of Huntington Beach to evaluate the compatibility of proposed development projects with the preservation of biological resources and open space. As a condition of development adjacent to environmentally sensitive habitats delineated in the General Plan, and for development in the coastal zone adjacent to environmentally sensitive habitats identified in the Local Coastal Program, a minimum buffer of 100-feet from the edge of habitat shall be established.
City of Huntington Beach Noise Ordinance (City of Huntington Beach Municipal Code Chapter 8.40)	Designates noise zones, establishes exterior noise standards, and defines exterior noise levels that are prohibited except under permit.
Natural Community Conservation Plan (NCCP) & Habitat Conservation Plan (HCP), County of Orange, Central and Coastal Subregion (1996)	The NCCP/HCP creates a multiple-species, multiple-habitat subregional Reserve System and implements a long-term adaptive management program that will protect coastal sage scrub and other habitats and species located within the habitat mosaic, while providing for economic uses that will meet the social and economic needs of the people of the subregion. Portions of the Reserve System in the HBEP area include Talbert Nature Preserve, Upper Newport Bay Ecological Reserve, and Upper Newport Bay Regional Park.

SETTING

PROJECT OVERVIEW

The proposed HBEP is a natural-gas-fired, combined-cycle, air-cooled, 939-megawatt (MW) electrical generating facility that would replace, and be constructed on the site of, the AES Huntington Beach Generating Station, an existing and operating power plant in Huntington Beach, California. The HBEP would consist of two independently operating, combined-cycle gas turbine power blocks. Equipment and facilities to be constructed and shared by both power blocks include natural gas compressors, water treatment facilities, emergency services, and administration and maintenance buildings. The project would be constructed on 28.6 acres entirely within the footprint of the existing Huntington Beach Generating Station. HBEP construction would require the removal of the existing Huntington Beach Generating Station Units 1, 2, 3, 4, and 5. Construction of the new HBEP and demolition of the existing units would occur over 7 ½ years.

The HBEP would reuse existing onsite potable 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 new generating units would use air-cooled condensers and would eliminate the use of ocean water for cooling, which is currently used for the existing Huntington Beach Generating Station units. During HBEP operation, stormwater and process wastewater would be discharged to a retention basin and then ultimately to the Pacific Ocean via an existing outfall. Sanitary wastewater would be conveyed to the Orange County Sanitation District via the existing City of Huntington Beach sewer connection. Two, 230-kilovolt (kV) transmission interconnections would connect both HBEP power blocks to the existing Southern California Edison (SCE) 230-kV switchyard that is located on a separate parcel within the existing Huntington Beach Generating Station site.

HBEP construction would require 22 acres of both onsite and offsite laydown and construction parking areas. Approximately 6 acres would be onsite and used for a combination of laydown and construction parking, and 16 acres would be offsite, approximately 13 miles north of HBEP at the existing Alamitos Generating Station and used for construction laydown.

REGIONAL SETTING

The regional setting of the proposed project encompasses the area within 10 miles of the HBEP and 10 miles of the offsite laydown area. The proposed HBEP site 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, the ASCON landfill, parklands and open space, and wetlands preserves.

The HBEP site is located immediately northeast of the Pacific Coast Highway (Highway 1) and east of Newland Street on the site of the operational Huntington Beach Generating Station. It is bounded on the west by a manufactured home/recreational vehicle park, on the north by a tank farm, on the north and east by the Huntington Beach Channel and residential areas, on the east and southeast by the Huntington Beach Wetland Preserve/Magnolia Marsh wetlands, and to the south and southwest by the Huntington Beach State Park and the Pacific Ocean. The Huntington Beach Wetlands Conservancy offices and the Wetlands and Wildlife Care Center are adjacent to the southwest boundary of the site, between the Huntington Beach Generating Station and Highway 1. The Santa Ana River (channelized) is located approximately 1.3 miles southeast of the proposed HBEP. The site is located on a gently sloping coastal plain.

Extensive urban development throughout the region has replaced most of the natural open space. Natural habitats are now restricted to scattered open space preserves and other protected areas.

Regional Wetlands and Other Protected Areas

Several important ecological reserves, wetland preservation sites, and designated open space areas 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. Following is a brief description of each of these areas (excerpted from HBEP 2012a and verified by staff):

Huntington Beach Wetlands Conservancy's Coastal Marsh Restoration Complex

The Huntington Beach Wetlands Conservancy (Conservancy) has been actively restoring coastal wetland habitats along the Talbert Channel and Huntington Beach Channel since 1989. The wetland restoration in this area includes four units: Newland Marsh, Magnolia Marsh (including Upper Magnolia Marsh), Brookhurst Marsh, and Talbert Marsh. Collectively these areas encompass approximately 193 acres. Primary habitats include coastal salt marsh, open water, and salt panne. Restoration of these areas began with the removal of the seaward levee of the Huntington Beach Flood Control Channel to restore tidal influence into the Talbert and Brookhurst Marshes. Restoration of the Magnolia Marsh site began in April of 2009 and involved excavation of 40,000 cubic yards of fill to recreate historical tidal channels. The restoration work in Magnolia Marsh was completed in February 2010. The Conservancy's Coastal Marsh Restoration Complex is adjacent to the HBEP; Upper Magnolia Marsh is located immediately east, and Magnolia Marsh is located immediately southeast of the proposed site. Several special-status wildlife species have been reported or observed in these wetlands. The wetland complex supports a breeding population of Belding's savannah sparrow's (*Passerculus sandwichensis beldingi*), a state listed endangered species. Light-footed clapper rail (*Rallus longirostris levipes*) has recently been documented breeding in the Brookhurst Marsh in the immediate vicinity of the HBEP site (Zembal and Hoffman 2012). It also breeds at the Santa Ana River Marsh at the southeastern end of the Huntington Beach Wetlands complex (CDFW 2013).The wetland complex provides foraging habitat for other endangered bird species including the western snowy plover (*Charadrius alexandrinus nivosus*) and the California least tern (*Sternula antillarum browni*) (Merkel & Associates 2004). Other special-status wildlife species observed utilizing the area include California brown pelicans (*Pelecanus occidentalis*) (foraging only) and the salt marsh skipper (*Panoquina errans*).

Talbert Nature Preserve

The Talbert Nature Preserve is in Costa Mesa along the east side of the Santa Ana River approximately 1.5 miles east of the HBEP site. Natural communities in this preserve include coastal strand (dunes), native grassland, woodlands, and riparian woodland/scrub. Special-status species in this area include southern tarplant (*Centromadia parryi ssp. australis*) and Davidson's salt scale (*Atriplex serenana var. davidsonii*).

U.S. Army Corps of Engineers Salt Marsh Restoration Project

The Los Angeles District of the USACE owns approximately 92 acres of salt marsh habitat just north of Highway 1 on the eastern side of the Santa Ana River 1.5 miles southeast of the HBEP site. The marsh is subject to muted tidal influence due to the elevation and operation of tidal gates. This wetland area supports a high diversity of bird species including western snowy plover and Belding's savannah sparrow.

Bolsa Chica Wetlands

The Bosla Chica wetlands are four miles to the northwest of the HBEP site. These wetlands encompass approximately 900 acres. Approximately 80 percent of the wetlands comprise a mixture of salt marsh and open mudflats with the remaining 20 percent consisting of open water with tidal flows controlled by flood gates. Many species of birds have been documented to occur at these wetlands including 32 special-status birds such as the California least tern, western snowy plover, Belding's savannah sparrow, and light-footed clapper rail. Several special-status plants, reptiles, and mammals also occur in this area including southern tarplant, Coulter's goldfields (*Lasthenia glabrata ssp. coulteri*), San Diego horned lizard (*Phrynosoma coronatum blainvillii*), western pond turtle (*Emys marmorata*), silvery legless lizard (*Anniella pulchra*), and the southern California salt marsh shrew (*Sorex ornatus salicornicus*).

Upper Newport Bay Ecological Reserve and Nature Preserve

Upper Newport Bay Ecological Reserve and Nature Preserve encompasses approximately 1,350 acres of wetland habitat including open water, mud flats, and coastal salt marsh. This wetland area is approximately five miles east of the proposed HBEP site. In 1975, the State of California purchased 752 acres of the wetlands and established the Upper Newport Bay Ecological Reserve, which is managed by CDFW. The ecological reserve is bordered on three sides by the Upper Newport Bay Regional Park and Nature Preserve, which is owned and managed by Orange County. Complete tidal flushing of the upper bay occurs every 3 to 4 days. This wetland provides habitat for a number of bird species including the light footed clapper rail, Belding's savannah sparrow, California least tern, and California brown pelican. One endangered plant species, salt marsh bird's-beak (*Cordylanthus maritimus ssp. maritimus*), is also found in this area.

San Joaquin Freshwater Marsh Reserve

The 512-acre San Joaquin Freshwater Marsh Reserve is located at the head of Newport Bay approximately seven miles east of the proposed HBEP site. The University of California Natural Reserve Program owns 202 acres of the reserve which are managed through U.C. Irvine. Orange County owns the remaining 310 acres. The reserve encompasses seasonal ponds, tule marsh, riparian woodland/scrub, wet meadow, and uplands. Special-status bird species observed at the preserve include the light-footed clapper rail, California least tern, Swainson's hawk (*Buteo swainsoni*), white tailed kite (*Elanus leucurus*), and tricolored blackbird (*Agelaius tricolor*). Other special-status species observed in this area include the western pond turtle and chaparral ragwort (*Senecio aphanactis*).

Seal Beach National Wildlife Refuge

The Seal Beach National Wildlife refuge is located approximately eight miles northwest of the proposed HBEP site within the boundaries of the Seal Beach Naval Weapons Station. The refuge includes 911 acres of remnant saltwater marsh in the Anaheim Bay estuary. The refuge provides important habitat for migratory birds and three endangered species; the light footed clapper rail, California least tern, and Belding's savannah sparrow.

Laguna Coast Wilderness Park

The 7,000-acre Laguna Coast wilderness park is located in the southwestern part of the San Joaquin Hills approximately eight miles east of the proposed HBEP site. Important natural communities in this area include coastal sage scrub, maritime chaparral, woodlands, and grasslands. Special-status species in this area include the California gnatcatcher (*Polioptila californica*) and the orange-throated whiptail (*Aspidoscelis hyperythra*).

Boomer Canyon Open Space Preserve

The city of Irvine's Boomer Canyon Open Space Preserve encompasses approximately 37,000 acres and has been officially designated as a Natural Landmark by the State of California and the U.S. Department of the Interior. The preserve contains large contiguous patches of natural habitats including coastal sage scrub, chaparral, woodlands, grassland, and riparian areas. Several special-status species including the California gnatcatcher, cactus wren (*Campylorhynchus brunneicapillus*), peregrine falcon (*Falco peregrinus*), orange-throated whiptail, and the Pacific pocket mouse (*Perognathus longimembris pacificus*) occur on the preserve. A portion of the Boomer Canyon Open Space preserve is located approximately 9.5 miles east of the proposed HBEP site.

Los Cerritos Wetlands

The Los Cerritos wetlands complex is an approximately 500-acre site that is adjacent to the Alamitos Generating Station site and approximately 1,245 feet west of the proposed offsite laydown area. Approximately two acres of these wetlands have been established as a California least tern nesting site (City of Long Beach 2006).

Jack Dunster Marine Biological Reserve

The Jack Dunster Marine Biological Reserve is a 2.7–acre site that contains 1.5 acres of land and 1.2 acres of shallow water that was constructed on the northwestern side of the Los Cerritos Channel. Habitats in this small reserve include coastal sage scrub, coastal marsh, intertidal mudflats, and rocky intertidal zone (City of Long Beach 2012a). The reserve is located approximately one mile west of the proposed offsite laydown area and provides habitat for waterfowl and fish.

Golden Shore Marine Biological Reserve Park

In 1997, the city of Long Beach's Golden Shore Marine Biological Reserve Park, originally a launch ramp and parking lot, was converted into 6.4 acres of intertidal and subtidal wetlands habitat as mitigation for the conversion of 20 acres of Shoreline Park into the Aquarium of the Pacific and the Rainbow Harbor commercial/recreation attraction (City of Long Beach 2012b). This park is located approximately 5.9 miles west of the HBEP offsite laydown area. This reserve park has salt marsh habitat that contains cordgrass, pickleweed, and saltgrass at slightly higher elevations, which provides habitat for waterfowl and fish.

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 following federally listed species is located in the regional vicinity of the proposed HBEP.

Coastal California gnatcatcher

Critical habitat for the coastal California gnatcatcher is located approximately 1.5 miles east of the proposed HBEP site on the east side of the Talbert Channel, just north of Highway 1 within the southern California Natural Community Conservation Plan Subregion of Orange County (USFWS 2007a). There is no critical habitat for the coastal California gnatcatcher within 10 miles of the offsite laydown area.

San Diego Fairy shrimp

Critical habitat (Subunit 1C) for the San Diego fairy shrimp (*Branchinecta sandiegonensis)* is found approximately two miles to the east and 2.3 miles to the northeast of the proposed HBEP site. Subunit 1C consists of 15 acres of habitat occupied by the San Diego fairy shrimp at the time of listing, and it is still extant within this subunit. This subunit contains all of the features essential to the conservation of the species. It is located south of the Santa Ana River, two miles inland from the coast on privately owned land. The vernal pool complex at subunit 1C is one of only five known vernal pool complexes containing the San Diego fairy shrimp in Orange County. This vernal pool complex and the vernal pool complex at Fairview Park (subunit 1B), which is excluded from critical habitat but part of the Fairview Park Master Plan, are the only remaining examples of coastal vernal pools in Orange County. Subunit 1C is closed to recreational use; however, this area has been degraded by past activities and may face future impacts from the development within this subunit or its watershed.

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 the Bolsa Chica State Beach and Bolsa Chica Preserve, which are located approximately four miles to the northeast of the proposed HBEP site. The beach habitats for western snowy plover within the designated critical habitat are generally characterized by large, flat, and open spaces.

Wetlands and Wildlife Care Center

The Wetlands and Wildlife Care Center is a non-profit organization that was initially designed to care for birds in the event of an oil spill in Southern California, but has expanded to care for any injured birds and some mammals. The Center includes a veterinary hospital with surgery rooms, areas for bird intake, holding, washing, drying, and recovery, as well as a series of outdoor chain-link pens with pools for wildlife rehabilitation and recovery. These open air pens are approximately 25 feet southeast of the proposed HBEP site.

EXISTING VEGETATION AND WILDLIFE

The applicant conducted a reconnaissance-level survey of biological resources within the proposed project area in September 2011. Supplemental surveys were conducted in July 2012. The supplemental botanical survey was conducted within the project area and along the perimeter fence line. The supplemental wildlife survey encompassed the project area and a 500-foot buffer from the project boundary. In addition, four observation points were established along the southeast perimeter of the site to conduct 10-minute observations of birds in the adjacent marsh.

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 HBEP site and offsite laydown area are industrial. The majority of the project area is paved and any unpaved areas are subject to regular chemical weed control. Landscape trees and shrubs have been planted along the perimeter fencing, but no natural habitats or wetlands are present. Species observed on site are primarily nonnative and include bindweed (*Convolvulus arvensis*), cheeseweed (*Malva parviflors*), ice plant (*Carpobrotus* spp.), lollypop tree (*Myoporum laetum*) and tocolote (*Centaurea meletensis*). In some areas, there is sparse cover of disturbance-tolerant native plants, such as alkali weed (*Cressa truxillensis*), Parish’s pickleweed (*Salcornia subterminalis*), and saltgrass (*Distichlis spicata*).

The following land use categories are present within one mile of the proposed HBEP site and offsite laydown area.

- **Urban.** Urban development represents the largest land cover type in the survey area. It includes residential, commercial, light industrial, public schools, and other municipal facilities.
- **Industrial and landfill.** This land cover type includes the SCE 230-kV substation and former Plains All American Tank Farm on the east side of the proposed HBEP site. The ASCON landfill is immediately northeast of the proposed HBEP site and the Orange County Sanitation District facilities are located southeast of the proposed HBEP site across the Santa Ana River.
- **Parks and open space.** Parks within one mile of the project area include Huntington Beach State Park, Edison Community Park, Gisler Park, and Eader Park. Open spaces include the green belt along the Santa Ana River and undeveloped landscaped areas along Magnolia Street.
- **Coastal Salt Marsh Wetland Preserves.** As described above (see "Regional Wetlands and Other Protected Areas"), the Huntington Beach Wetlands Conservancy's Coastal Marsh Restoration Complex is located adjacent to the proposed HBEP site.

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 (excerpted from HBEP 2012a and verified by staff).

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 immediate vicinity of the proposed HBEP site, the southern coastal salt marsh habitat is found in the Huntington Beach Wetlands Conservancy's Coastal Marsh Restoration Complex, at the USACE's Salt Marsh Restoration Project near the mouth of the Santa Ana River, at the Talbert Nature Preserve, at the Bolsa Chica Ecological Reserve, and at the Seal Beach National Wildlife Refuge. Southern coastal salt marsh habitat is also found to the east northeast of the offsite laydown area.

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*). Southern foredune habitat is located southeast of the proposed HBEP site within Huntington Beach State Park and at Newport Beach located southeast of the offsite laydown area. A small area of southern foredune habitat is also found at the Bolsa Chica Ecological Reserve.

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 constituting dense 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 occurs 0.6 mile to northwest of the proposed HBEP site and southeast of the offsite laydown area.

Southern Cottonwood Willow Riparian Forest

Southern cottonwood willow riparian forest is characterized by broadleaf winter-deciduous trees including cottonwoods (*Populus fremontii*; *P. trichocarpa*) and several types of willows including black willow (*Salix gooddingii*), sand bar willow (*Salix exigua*), Pacific willow (*Salix lasiandra*), and arroyo willow (*Salix lasiolepis*). Associated species often include sycamore (*Platanus racemosa*), mugwort (*Artemisia douglasiana*), and coyotebrush (*Baccharis glutinosa*). Southern cottonwood willow riparian scrub occurs along the Santa Ana River greenbelt approximately three miles to the east and northeast of the proposed HBEP site.

Southern Coast Live Oak Riparian Forest

Southern coast live oak riparian forest is characterized by locally dense evergreen woodlands dominated by coast live oak (*Quercus agrifolia*). Associated species may include bay laurel (*Umbellularia californica*), big leaf maple (*Acer macrophyluum*), mugwort, toyon (*Hertermeles arbutifolia*), wild rose (*Rosa californica*), and poison oak (*Toxicodendron diversilobum*). A small area of southern coast live oak woodland is located approximately nine miles southeast of the proposed HBEP site.

Common Wildlife

Due to the frequency and intensity of disturbance from operation of the existing Huntington Beach Generating Station, the proposed HBEP site does not provide important habitat for native wildlife. Species observed within the proposed project site include California ground squirrel (*Otospermophilus beecheyi),* house finch (*Carpodacus mexicanus*)*,* house sparrow (*Passer domesticus*), and Western fence lizard (*Sceloporus occidentalis*). Other birds protected under the Migratory Bird Treaty Act (MBTA) and California Fish and Game Code, but without other special-status listing such as killdeer (*Charadrius vociferous*), doves (*Zenaida* sp.), and sparrows (*Passer* sp.) may nest in open areas and in unused structures on the HBEP site.

The adjacent marshes provide habitat for a greater diversity of common wildlife species. Species observed in this habitat include American crow (*Corvus brachyrhynchos),* barn swallow (*Hirundo rustica), c*ommon yellowthroat (*Geothlypis trichas*)*,* double-crested cormorant (*Phalacrocorax auritus*)*,* European starling (*Sturnus vulgaris*), great blue heron (*Ardea herodias*), great egret (*Ardea alba*)*,* gull (*Larus* sp.), killdeer (*Charadrius vociferous*)*,* mourning dove (*Zenaida macroura*)*,* rock pigeon (*Columba liviaII*)*, s*nowy egret (*Egretta thula*)*,* and turkey vulture (*Cathartes aura*).

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 the 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, and 2) as well as CRPR 3 and 4 species;
- A plant listed as rare under the California Native Plant Protection Act;
- 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 and offsite laydown area are industrial brownfield sites with operating power plants, and vegetation is limited to a few weedy species and maintained landscaping. Rare plants and most special-status wildlife are not expected to occur onsite at either location; however, nearby marshes, parks, 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 HBEP 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		
Chaparral sand-verbena (*Abronia villosa var. aurita*)	__/__/1B.1/ G5T3T4/S2	**Not Likely to Occur.** No suitable habitat occurs within the proposed project site or offsite laydown area. Historic CNDDB occurrence in Santa Ana River bed, 1.5 to 2 miles from the ocean.
Aphanisma (*Aphanisma blitoides*)	__/__/1B.2/ G3G4/S3	**Not Likely to Occur**. No suitable habitat occurs within the proposed project site or offsite laydown area. Historic CNDDB occurrence in Newport Beach and Upper Newport Bay Regional Park.
Ventura Marsh milk-vetch (*Astragalus pycnostachyus var. lanosissimus*)	FE/SE/1B.1/ G2T1/S1	**Not Likely to Occur.** No suitable habitat occurs within the proposed project site or offsite laydown area. Nearest CNDDB occurrence is historic record from Bolsa Bay; possibly extirpated.
Coulter's saltbush (*Atriplex coulteri)*	__/__/ 1B.2/ G2/S2	**Not Likely to Occur.** No suitable habitat occurs within the proposed project site or offsite laydown area. Nearest CNDDB occurrence is historic record at the Newport Bay approximately 5.3 miles from proposed HBEP project site.
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 area. Nearest records are from 1932 at the Newport Bay and 1998 at the Crystal Cove State Park, Pelican Point Coastal Terrace.
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 area. One record 9 miles northeast of the offsite laydown area; this occurrence is from 1881 and the area is now developed.
Davidson's saltscale (*Atriplex serenana var. davidsonii*)	__/__/1B.2/ G5T2?/ S2?	**Low.** No suitable habitat occurs within the proposed project site or offsite laydown area. CNDDB occurrence records are from Santa Ana River, Balboa, Newport Lagoon, San Joaquin Marsh Preserve, and UC National Preserve System. The nearest CNDDB record is 1.7 mile from the proposed HBEP site.

Common Name (*Scientific Name*)	Status Fed/State/CRPR/ G-Rank/S-Rank	Potential for Occurrence in Project Impact Area
Intermediate mariposa-lily (*Calochortus weedii var. intermedius*)	__/__/1B.2/ G3G4T2/S2.2	**Not Likely to Occur.** No suitable habitat occurs within the proposed project site or offsite laydown area. CNDDB record was in rock outcrop habitat in San Joaquin Hills approximately 10 miles from the HBEP site.
Southern tarplant (*Centromadia parryi ssp. australis*)	__/__/1B.1/ G3T2/S2	**Low.** Only very poorly suitable habitat occurs within the proposed project site or offsite laydown area. The nearest CNDDB records are at Loynes Drive and Studebaker Ave. (0.3 mile northwest of offsite laydown area), Bixby Ranch Oil Field (0.5 mile south of offsite laydown area),Talbert regional Park, Santa Ana River Marsh, Upper Newport Back Bay, Bolsa Chica, and Long Beach about 1 mile from the offsite laydown area.
Salt marsh bird's-beak (*Chloropyron maritimum ssp. maritimum*)	FE/SE/1B.2/ G4?T1/S1	**Not Likely to Occur.** No suitable habitat occurs within the proposed project site or offsite laydown area. Most of the nearest occurrences are historic records and are noted in CNDDB as possibly extirpated. Nearest presumed extant, recent record is in Upper Newport Bay Ecological Reserve 5 miles east of the HBEP site.
Many-stemmed dudleya (*Dudleya multicaulis*)	__/__/1B.2/ G2/S2	**Not Likely to Occur.** No suitable habitat occurs within the proposed project site or offsite laydown area. Documented from a 1932 collection from Newport Bay approximately 5 miles east of the HBEP site and a 1908 collection from Corona Del Mar over 7 miles southeast of the project site. These occurrences are believed to be extirpated.
Cliff spurge (*Euphorbia misera*)	__/__/2.2/ G5/S1	**Not Likely to Occur.** No suitable habitat occurs within the proposed project site or offsite laydown area. The closest record is 7 miles southeast of the HBEP site and this species has not been documented within 10 miles of the offsite laydown area.
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 area. The CNDDB documents two historic occurrences; 5 miles north and 5 miles east of the HBEP site. This species is presumed extirpated in California.
Mesa horkelia (*Horkelia cuneata var. puberula*)	__/__/1B.1/ G4T2/S2.1	**Not Likely to Occur.** No suitable habitat occurs within the proposed project site or offsite laydown area. The closest record is about 5 miles northwest of the HBEP site at the Bolsa Chica Salt Marsh.
Southwestern spiny rush (*Juncus acutus* ssp. *leopoldii*)	__/__/4.2/ G5T5/S3.2	**Low.** No suitable habitat occurs within the proposed project site or offsite laydown area, but occurs in the Huntington Beach Wetlands Conservancy's coastal salt marsh preserved immediately adjacent to the HBEP site.

Common Name (*Scientific Name*)	Status Fed/State/CRPR/ G-Rank/S-Rank	Potential for Occurrence in Project Impact Area
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 area. Documented CNDDB occurrences within 5 miles of the HBEP site or laydown area are from Los Alamitos, Bryant Ranch, Seal Beach National Wildlife Refuge, Costa Mesa, and Bolsa Chica Salt Marsh. All are historic records, and most are listed by the CNDDB as possibly extirpated.
Robinson's pepper-grass (*Lepidium virginicum var. robinsonii*)	__/__/4.3/ G5T3/S3	**Not Likely to Occur.** No suitable habitat occurs within the proposed project site or offsite laydown area. There is one CNDDB record from the UC Irvine Open Space preserve about 7 miles from the HBEP site.
Mud nama *(Nama stenocarpum*)	__/__/2B.2/ G4G5/S1S2	**Not Likely to Occur.** No suitable habitat occurs within the proposed project site or offsite laydown area. Nearest occurrences are a historic record from the Seal Beach National Wildlife Refuge 2 miles from the offsite laydown area and a 1998 record from vernal pools in the Fairview Regional Park approximately 3 miles from the HBEP site.
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 area. Nearest record is from 1908 collection at Huntington Beach approximately 1.5 miles from the HBEP site; this occurrence has likely been extirpated by development.
Prostrate vernal pool navarretia (*Navarretia prostrata*)	__/__/1B.1/ G2/S2	**Low.** No suitable habitat occurs within the proposed project site or offsite laydown area. Known from vernal pools in the Fairview Regional Park approximately 2 miles from the HBEP site.
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 area. There are nearby observations at Seal Beach, Newport Bay and Peninsula, Bolsa Chica, the mouth of the Santa Ana River, and the southern end of the Huntington State Beach. Closest CNDDB occurrences are about 1.7 miles from the HBEP site and about 1.25 miles from the offsite laydown area.
California Orcutt grass (*Orcuttia californica)*	FE/SE/1B.1/G1/S 1	**Not Likely to Occur.** No suitable habitat occurs within the proposed project site or offsite laydown area. Species was documented approximately 5 miles northwest of the offsite laydown area, but this occurrence is presumed extirpated.
Lyon's pentachaeta (*Pentachaeta lyonii*)	FE/SE/1B.1/G2/S 2	**Not Likely to Occur.** No suitable habitat occurs within the proposed project site or offsite laydown area. The nearest record is approximately 4.5 miles northeast of the project area and approximately 6 miles southeast of the offsite laydown area.

Common Name (*Scientific Name*)	Status Fed/State/CRPR/ G-Rank/S-Rank	Potential for Occurrence in Project Impact Area
Nuttall's scrub oak (*Quercus dumosa*)	__/__/1B.1/ G2/S2	**Not Likely to Occur.** No suitable habitat occurs within the proposed project site or offsite laydown area, and not observed during surveys of the project site. Nearest occurrence record is approximately 6 miles southeast of the HBEP and no records have been documented within 10 miles of the offsite laydown area.
Sanford's arrowhead (*Sagittaria sanfordii*)	__/__/1B.2/ G3/S3	**Not Likely to Occur.** No suitable habitat occurs within the proposed project site or offsite laydown area. This species has been documented about 5.7 miles northwest of the HBEP site. There are no records within 10 miles of the offsite laydown areas.
Chaparral ragwort (*Senecio aphanactis*)	__/__/2.B2/ G3?/S2	**Not Likely to Occur.** No suitable habitat occurs within the proposed project site or offsite laydown area. The nearest record is approximately 7 miles east northeast of the HBEP site.
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 area. This species has been recorded approximately one-half mile north of the offsite laydown area; however, this record is from 1936 and the area is now developed.
Estuary seablite (*Suaeda esteroa*)	__/__/1B.2/ G3/S2	**Not Likely to Occur.** No suitable habitat occurs within the proposed project site or offsite laydown area. Historic occurrences have been reported at the Bolsa Chica Ecological Reserve, near the Seal Beach National Wildlife Refuge, and Newport Slough east of the Santa Ana River (approximately 5 miles from HBEP site).
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 area. Closest CNDDB occurrence record is near Newport Bay approximately 5.1 miles from the HBEP site.
WILDLIFE		
Invertebrates		
San Diego fairy shrimp (*Branchinecta sandiegonensis*)	FE/__/__/ G1/S1	**Low.** No suitable vernal pool habitat occurs within the HBEP site or offsite laydown area. Recorded in Fairview Park, 2.3 miles from the HBEP site. There is designated critical habitat about 1.5 miles east and 2.3 miles northeast of the HBEP site.
Western tidal-flat tiger beetle (*Cicindela gabbii*)	__/SA/__/ G4/S1	**Not Likely to Occur.** No suitable habitat occurs within the HBEP site or offsite laydown area. Area occurrences are historic and most are considered extirpated. Inhabits estuaries and mudflats along the Southern California coast.
Sandy beach tiger beetle (*Cicindela hirticollis gravida*)	__/SA/__/ G5T2/S1	**Not Likely to Occur.** No suitable habitat occurs within the HBEP site or offsite laydown area. Area occurrences are historic and are presumed extirpated by development. Inhabits areas adjacent to non-brackish water along the California coast.

Common Name (*Scientific Name*)	Status Fed/State/CRPR/ G-Rank/S-Rank	Potential for Occurrence in Project Impact Area
Western beach tiger beetle (*Cicindela latesignata latesignata*)	__/SA/__/ G4T1T2/S1	**Not Likely to Occur.** No suitable habitat occurs within the HBEP site or offsite laydown area. Area occurrences are historic and are extirpated. Inhabits mudflats and beaches in Southern California.
Senile tiger beetle (*Cicindela senilis frosti*)	__/SA/__/ G4T1/S1	**Not Likely to Occur.** No suitable habitat occurs within the HBEP site or offsite laydown area. One regional historic record, presumed extirpated. Species inhabits marine shoreline, from central California coast south to salt marshes of San Diego. It is also found at Lake Elsinore.
Globose dune beetle (*Coelus globosus*)	__/SA/__/ G1/S1	**Low.** No suitable habitat occurs within the HBEP site or offsite laydown area. Recorded in 2008 at Huntington Beach less than one mile southeast of the HBEP site. Species inhabits coastal sand dunes.
Monarch butterfly (*Danaus plexippus*)	__/SA/__/ G5/S3	**Moderate.** Although not recorded on site, could roost in landscape trees throughout the HBEP. Records from the 1980s and 1990s Bolsa Chica Ecological Reserve, El Dorado Nature Center, Gum Grove Park, Huntington Beach Central Park, and Norma B. Gibbs Regional Park. Nearest record is one mile southeast of the offsite laydown area. Roosts in wind-protected tree groves along the California coast in winter.
Wandering (saltmarsh) skipper (*Panoquina errans*)	__/SA/__/ G4G5/S1	**Moderate.** No suitable habitat occurs within the HBEP site or offsite laydown area. Records from 1989 at the Bolsa Chica Ecological Reserve are about 5 miles southeast of the offsite laydown area. Recorded in 2004 at Newland Marsh less than one-half mile northwest of the HBEP site and in the Brookhurst Marsh less than one mile southeast of the HBEP site. Inhabits coastal salt marshes in Southern California; requires moist saltgrass for larval development.
Dorothy's El Segundo Dune weevil (*Trigonoscuta dorothea dorothea*)	__/SA/__/ G1T1/S1	**Not Likely to Occur.** No suitable habitat occurs within the HBEP site or offsite laydown area. Records from 1989 at the Bolsa Chica Ecological Reserve, about 5 miles southeast of the offsite laydown area. Inhabits coastal sand dunes in Los Angeles County.
Mimic tryonia (=California brackishwater snail) (*Tryonia imitator*)	__/SA/__/ G2G3/S2S3	**Low.** No suitable habitat occurs within the HBEP site or offsite laydown area. Records from 1996 at Upper Newport Bay and 1968 at Bolsa Chica Ecological Reserve. Inhabits coastal lagoons, estuaries, and salt marshes along California coast.
Reptiles		
Orange-throated whiptail (*Aspidoscelis hyperythra*)	__/CSC/__/ G5/S2	**Low.** No suitable habitat occurs within the HBEP site or offsite laydown area. Nearest occurrence is historic record from Corona Del Mar, over 6 miles from the HBEP site, and is extirpated. Inhabits low elevation coastal scrub, chaparral, and valley-foothill hardwood habitats.

Common Name (*Scientific Name*)	Status Fed/State/CRPR/ G-Rank/S-Rank	Potential for Occurrence in Project Impact Area
Green turtle (*Chelonia mydas*)	FT/__/__/ G3/S1	**Low.** No aquatic habitat occurs within the HBEP site or offsite laydown area. Nearest occurrence is in the San Gabriel River between East 2nd Street and Hwy 22 adjacent to power generating plant at offsite laydown area location.
Red-diamond rattlesnake (*Crotalus ruber*)	__/CSC/__/ G4/S2?	**Low.** No suitable habitat occurs within the HBEP site or offsite laydown area. Nearest record approximately 9 miles from the HBEP site. Suitable habitats include arid scrub, coastal chaparral, oak and pine woodlands, rocky grassland, and cultivated areas.
Western pond turtle (*Emys marmorata*)	__/CSC/__/ G3G4/S3	**Not Likely to Occur.** No aquatic habitat occurs at the HBEP site or offsite laydown area. All nearby records possibly extirpated.
Coast horned lizard (*Phrynosoma blainvillii*)	__/CSC/__/ G4G5/S3S4	**Low.** No suitable habitat occurs within the HBEP site or offsite laydown area. 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.
Birds		
Tricolored blackbird (*Agelaius tricolor*)	BCC/CSC/__/ G5T2T4/S2S3	**Low.** No suitable habitat occurs within the HBEP site or offsite laydown area. Recorded approximately 0.5 mile from the offsite laydown area.
Southern California rufous-crowned sparrow (*Aimophila ruficeps canescens)*	__/WL/__/ G5T2T4/S2S3	**Low.** No suitable habitat occurs within the HBEP site or offsite laydown area. The only record within 10 miles of the project area was on the west slope of Muddy Canyon, approximately 1 mile south of Signal Peak, San Joaquin Hills (2.5 miles east of Newport Beach).
Grasshopper sparrow (*Ammodramus savannarum*)	__/CSC/__/ G5/S2	**Low.** No suitable habitat occurs within the HBEP site or offsite laydown area. Closest occurrence is approximately 7 miles from the proposed HBEP site. Inhabits coastal sage scrub.
Burrowing owl (*Athene cunicularia*)	BCC/CSC/__/ G4/S2	**Low.** No suitable habitat occurs within the HBEP site or offsite laydown area. Closest record is about 2.6 miles from the proposed project at Fairview Park in Costa Mesa; also recorded at Bolsa Chica Ecological Reserve.
Ferruginous hawk (*Buteo regalis*)	BCC/WL/__/ G4/S3S4	**Low.** No suitable habitat occurs within the HBEP site or offsite laydown area. Nearest CNDDB record is approximately 11 miles from the proposed project site and 2.5 miles from the offsite laydown area in Los Alamitos.
Coastal cactus wren (*Campylorhynchus brunneicapillus sandiegensis*)	BCC/CSC/__/ G5T3Q /S3	**Low.** No suitable habitat occurs within the HBEP site or offsite laydown area. Nearest occurrences for this species have been recorded approximately 8-10 miles of the proposed HBEP site.

Common Name (*Scientific Name*)	**Status Fed/State/CRPR/ G-Rank/S-Rank**	**Potential for Occurrence in Project Impact Area**
Western snowy plover (*Charadrius alexandrinus nivosus*)	FT/CSC/__/ G4T3/S2	**High.** Reported less than one mile from the proposed HBEP site utilizing the coastal salt marshes in the vicinity of the site for foraging and loafing, including the Talbert Marsh. Nests at Huntington State Beach, approximately 1.3 miles from the HBEP site. Requires sandy, gravelly, or friable soils for nesting. There is designated critical habitat about 1.5 miles southeast of the HBEP site at the mouth of the Santa Ana River and about 5 miles northwest of the HBEP site at the Bolsa Chica Ecological Reserve and State Beach.
Western yellow-billed cuckoo (*Coccyzus americanus occidentalis*)	FC/SE/__/ G5T3Q/S3	**Not Likely to Occur.** No suitable habitat occurs within the HBEP site or offsite laydown area. Only record from the area, at San Gabriel River near Artesia, reported in 1912 and now presumed extirpated.
White-tailed kite (*Elanus leucurus*)	__/FP/__/ G5/S3	**Low.** No suitable habitat occurs within the HBEP site or offsite laydown area, but it could forage in adjacent marshes. Documented in multiple locations east to northeast of the project area. The closest occurrence is in Upper Newport Bay approximately 6.5 miles from the project area.
California horned lark (*Eremophila alpestris actia*)	__/WL/__/ G5T3Q/S3	**Low.** No suitable habitat occurs within the HBEP site or offsite laydown area. Documented approximately 7 miles southeast of the HBEP site.
Yellow-breasted chat (*Icteria virens*)	__/CSC/__/ G5/S3	**Not Likely to Occur.** No suitable habitat occurs within the HBEP site or offsite laydown area. Documented in multiple locations approximately 8 miles northeast to southeast of the HBEP site.
California black rail (*Laterallus jamaicensis coturniculus*)	BCC/ST,FP/__/ G4T1/S1	**Low.** No suitable habitat occurs within the HBEP site or offsite laydown area. Historic CNDDB occurrence records are from 1970 and 1971 in the Upper Newport Bay approximately 5 miles from the proposed project site.
Osprey (*Pandion haliaetus*)	__/WL/__/ G5/S3	**Low.** No suitable habitat occurs within the HBEP site or offsite laydown area, but could forage in open waters near the project. The nearest CNDDB nesting occurrence is approximately 5.2 miles from the proposed HBEP site at the upper Newport Bay Ecological Reserve.
Belding's savannah sparrow (*Passerculus sandwichensis beldingi*)	__/SE/__/ G5T3/S3	**High.** No suitable habitat occurs within the HBEP site or offsite laydown area, but occurs in adjacent marshes. Occurs in several of the wetland preserves in the vicinity, including the adjacent Magnolia and Upper Magnolia marshes. The nearest CNDDB occurrence is at the Newland Marsh approximately 0.5 mile from the proposed HBEP site.
California brown pelican (*Pelecanus occidentalis Californicus*)	FD/SD, FP/__/ G4T3/S1S2	**High.** No suitable feeding or nesting habitat occurs within the HBEP site or offsite laydown area. Recorded at the Santa Ana River Marsh and offshore approximately 6 miles southwest of the offsite laydown area. Routinely observed throughout the area.

Common Name (*Scientific Name*)	Status Fed/State/CRPR/ G-Rank/S-Rank	Potential for Occurrence in Project Impact Area
Coastal California gnatcatcher (*Polioptila californica californica*)	FT/CSC/__/ G3T2/S2	**Low.** No suitable habitat occurs within the HBEP site or offsite laydown area. The nearest CNDDB occurrence records are approximately 4 to 10 miles from the HBEP site, including several from around Upper Newport Bay. There is designated critical habitat about 1.5 mile east of the HBEP site on the east side of Talbert Channel.
Light-footed clapper rail (*Rallus longirostris levipes*)	FE/SE, FP/__/ G5T1T2/S1	**High.** Not likely to occur at the HBEP site or offsite laydown area, but could occur in adjacent marshes. Nests at the nearby Brookhurst and Santa Ana River Marshes and possibly the Talbert Marsh, the closest of which is less than one mile from the HBEP site. It is expected to forage within Magnolia Marsh (Zembal 2013), adjacent to the HBEP site. When restoration is complete (within a few years), Magnolia Marsh is expected to provide suitable breeding habitat.
Bank swallow (*Riparia riparia*)	__/ST/__/ G5/S2S3	**Not Likely to Occur.** No suitable habitat occurs within the HBEP site or offsite laydown area. The last CNDDB occurrence record was from 1937 in Huntington Beach approximately 1.6 miles from the proposed HBEP site. Nesting populations are considered extirpated in southern California.
Black skimmer (*Rynchops niger*)	BCC/CSC/__/ G5/S1S3	**Low.** No suitable habitat occurs within the HBEP site or offsite laydown area; possible foraging habitat in open water habitats in the immediate vicinity of HBEP. The nearest nesting record is from 1990 at the Bolsa Chica Ecological Reserve.
California least tern (*Sternula antillarum browni*)	FE/SE, FP/ G4T2T3Q/S2S3	**Moderate.** No suitable habitat occurs within the HBEP site or offsite laydown area. Nests at Huntington State Beach, approximately 1.3 miles from the HBEP site, and at the Bolsa Chica Ecological Reserve approximately 4.75 miles from the HBEP site. It forages at the Talbert Marsh as well as along the lower portions of the Talbert and Huntington Channel.
Least Bell's vireo (*Vireo bellii pusillus*)	FE/SE/__/ G5T2/S2	**Not Likely to Occur.** No suitable habitat occurs within the HBEP site or offsite laydown area. The nearest record is from Talbert Nature Preserve, approximately 1.75 miles from the project site. Habitat consists of southern willow riparian scrub with mulefat scrub understory.
Mammals		
Western mastiff bat (*Eumops perotis californicus*)	__/CSC/__/ G5T4/S3?	**Moderate.** No suitable habitat occurs within the HBEP site or offsite laydown area, but may forage over the open water and wetlands and around the HBEP site. CNDBB records include Huntington Beach Central Park, 4 miles from the HBEP site (date of record not provided by CNDDB), and a record from Buena Park in 1990, approximately 9 miles from the offsite laydown area.

Common Name (*Scientific Name*)	Status Fed/State/CRPR/ G-Rank/S-Rank	Potential for Occurrence in Project Impact Area
Silver-haired bat (*Lasionycteris noctivagans*)	__/SA/__/ G5/S3S4	**Low.** No suitable habitat occurs within the HBEP site or offsite laydown area. There is one historic record from Bellflower in 1978, approximately 6.6 miles north of the offsite laydown area. This species forages over streams, ponds, and open brushy areas and roosts primarily in trees.
Hoary bat (*Lasiurus cinereus*)	__/SA/__/ G5/S4?	**Moderate.** No suitable habitat occurs within the HBEP site or offsite laydown area, but may forage in wetland areas adjacent to and near the project. There is one historic record from Newport Beach in 1990, approximately 4 miles southeast of the HBEP site. This species utilizes open habitats or habitat mosaics, and feeds near habitat edges. Requires trees for roosting and water.
Western yellow bat (*Lasiurus xanthinus*)	__/CSC/__/ G5/S3	**Low.** No suitable habitat occurs within the HBEP site or offsite laydown area. A CNDBB record from 1990 in Garden Grove is approximately 4.6 miles northeast of the offsite laydown area. The species is found in valley foothill riparian, desert riparian, desert wash, and palm oasis habitats. Roosts in trees and forages over water.
South coast marsh vole (*Microtus californicus stephensi*)	__/CSC/__/ G5T1T2/S1S2	**Low.** No suitable habitat occurs within the HBEP site or offsite laydown area. The CNDDB records occurrences at Sunset Beach (1916) and the Seal Beach Wildlife Refuge (1988) approximately 7 and 9 miles, respectively, from the HBEP site. It occurs in tidal marshes in Los Angeles, Orange, and Southern Ventura counties.
Big free-tailed bat (*Nyctinomops macrotis*)	__/CSC/__/ G5/S2	**Not Likely to Occur.** No suitable habitat occurs within the HBEP site or offsite laydown area. Nearest record is from Corona Del Mar (1988), approximately 7 miles southeast of the HBEP site. This species inhabits low-lying arid areas in Southern California and requires high cliffs or rocky outcrops for roosting.
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 area. Presumed extinct in the area. Suitable habitats for the contains fine-grain sandy substrates on the coastal strand, coastal dunes, river alluvium and coastal sage scrub.
Southern California saltmarsh shrew (*Sorex ornatus salicornicus*)	__/CSC/__/ G5T1? /S1	**Low.** No suitable habitat occurs within the HBEP site or offsite laydown area. Historic CNDDB records are from 1933 in the Newport Lagoon, approximately 5 miles east-southeast of HBEP and 1968 in the general vicinity of Seal Beach, approximately 2 miles southwest of the offsite laydown area. Occurs in coastal marshes and requires dense vegetation and woody debris for cover.

Common Name (*Scientific Name*)	Status Fed/State/CRPR/ G-Rank/S-Rank	Potential for Occurrence in Project Impact Area
American badger (*Taxidea taxus*)	__/CSC/__/ G5/S4	**Low.** No suitable habitat occurs within the HBEP site or offsite laydown area. One local CNDDB record from 1998 in the Newport Beach, approximately 3 miles southeast of the HBEP site, was of a badger killed on Superior Avenue. Inhabits most shrub, forest, and herbaceous habitats, primarily in drier open areas. Requires friable soil for burrow construction.

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)
List 1B: Rare, threatened, or endangered in California and elsewhere
List 2: Rare, threatened, or endangered in California but more common elsewhere
List 3 = Plants which need more information
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 HBEP site and offsite laydown areas are entirely developed with no natural habitats present. The vegetation observed during the September 2011 and July 2012 reconnaissance surveys and staff site visits was limited to landscaping trees and shrubs and a few scattered weedy plants. As the potential for special-status plants to occur at the HBEP site and offsite laydown area is low, rare plant surveys were not conducted. However, several special-status plant species have been documented in the regional vicinity of the proposed project, including at the adjacent marshes. It is unlikely that special-status plants would colonize the project site or the offsite laydown area, but even in the event that would occur on unpaved or landscaped areas, vegetation and weed management practices at both sites would preclude persistence.

Special-Status Wildlife

The applicant conducted general reconnaissance surveys of the project site in September 2011 and 2012. 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. Additional accounts for species with a low potential to occur on site are included in Section 5.2.2.8, *Special-Status Wildlife Species*, of the AFC (HBEP 2012a).

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 migration 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 year-round 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. Nesting habitat on the site is limited to landscaped areas including trees, and open gravely substrates where ground-nesting birds such as killdeer could nest on site. Small mammals and reptiles as well as landscape plants provide some foraging opportunities for birds on site. Although the site itself provides relatively little nesting and foraging habitat for native birds, the adjacent wetlands are regionally important for some bird species. Native birds, regardless of any additional conservation status at the local, state, or federal level, are afforded protection by the federal MBTA and California Fish and Game Code.

Belding's Savannah Sparrow

The Belding's savannah sparrow (*Passerculus sandwichensis beldingi*) is a state-listed endangered species. This subspecies is distinguished from the more common northern subspecies by a longer and thicker bill, darker and thicker streaks on the underside, darker and coarser streaks on the upper side, and darker marks on the face. The Belding's savannah sparrow is one of few species of birds that reside year-round in the coastal salt marshes of southern California, where it is endemic. This subspecies ranged historically from Goleta in Santa Barbara County in California south to El Rosario, Baja California, Mexico.

Belding's savannah sparrow is found in tidal and non-tidal, coastal pickleweed (*Salicornia virginica*) marshes. Breeding territories can be very small and the birds nest semi-colonially or in localized concentrations within a larger block of habitat, all of which may appear generally suitable. The species forages on the ground for insects, snails and other invertebrates, and seeds. Breeding appears to begin in early March. Within wetlands, the distribution of the species generally follows that of the pickleweed. The Belding's savannah sparrow occupies the Huntington Beach Wetland marsh complexes and breeds in the coastal salt marsh wetlands in the immediate vicinity of the HBEP site (Merkel & Associates 2004; CDFW 2013a). This species is also found in the Bolsa Chica wetlands, at the Seal Beach National Wildlife Refuge, the Upper Newport Bay Ecological Reserve, and the USACE salt marsh restoration site on the east side of the Santa Ana River. Recent surveys in the Huntington Beach Wetlands documented 26 Belding's savannah sparrow territories in Magnolia Marsh, 37 territories in Brookhurst Marsh, and 4 territories in the Talbert Marsh (Zembal and Hoffman 2010).

No suitable habitat for the species occurs within the proposed HBEP, and no Belding's savannah sparrows were observed during the 2011 and 2012 surveys of the project site.

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.

California brown pelicans have been observed foraging within the tidal channels in the vicinity of the HBEP site and utilize the adjacent coastal salt marsh habitat for resting and loafing (Merkel & Associates 2004). Pelicans are routinely observed in the area and have been documented offshore approximately 6 miles southwest of the offsite laydown area (CDFW 2013).

The open space and wetland habitats surrounding the site provide resting and loafing habitat for the species in the immediate vicinity of the site; however, there is no natural habitat on the HBEP site and the potential for occurrence on site is low. Additionally, California brown pelican is not expected to breed in adjacent marshes 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). It 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 Huntington State Beach, the Bolsa Chica wetlands, Seal Beach National Wildlife Refuge, and the Upper Newport Bay Ecological Reserve (CDFW 2013). They forage at the Talbert Marsh as well as along the lower portions of the Talbert and Huntington Channel. According to the Long Beach City Plan, Los Cerritos wetlands near the offsite laydown area have been preserved and an additional 2 acres have been established as a California least tern nesting site. Recent California least tern breeding surveys detected breeding pairs at the Huntington State Beach, Seal Beach and the Bolsa Chica Ecological Reserve (Marschalek 2008, 2009, and 2010).

There is no suitable nesting habitat for the California least tern at the HBEP site and it has very limited potential to occur on the site. However, the species would likely use the neighboring wetlands for foraging and loafing.

Light-footed Clapper Rail

The light-footed clapper rail (*Rallus longirostris levipes*) is federally and state-listed as endangered. It occupies coastal salt marshes from Santa Barbara County, California, to San Quintin Bay, Baja California, Mexico. Within its historical range the amount of suitable habitat has been severely reduced by conversion of marshes for other uses. This subspecies is one of three clapper rail subspecies in California formally recognized as endangered by the federal government and endangered or rare by the State of California.

The light-footed clapper rail has a tawny breast, gray-brown back, and vertical dusky and white bars on flanks with a white patch under its short upcocked tail. The light-footed clapper rail forages for mollusks and crustaceans in coastal salt marshes, mudflats, and along tidal channels. Studies of Upper Newport Bay and Anaheim Bay, (USFWS 1985) documented that the rail foraged throughout the salt marsh community and occasionally in surrounding habitats. Considerable foraging was observed in vegetation of the higher marsh in which *Salicornia virginica*, *Limonium californicum,* and arrow-grass (*Triglochin maritima)* were prevalent. Foraging birds were also observed along vegetation-mud flat interfaces, along mud banks of tidal creeks, in freshwater vegetation and ditched/ponded water, and to a lesser extent on open mudflats and upland hillsides. Nest sites are usually in areas of dense marsh vegetation including pickleweed and cord grass (*Schoenoplectus* spp.). It breeds from early March through August.

The light-footed clapper rail has recently been documented breeding in the Brookhurst Marsh in the immediate vicinity of the HBEP site (Zembal and Hoffman 2012). It also breeds at the Santa Ana River Marsh at the southeastern end of the Huntington Beach Wetlands complex (CDFW 2013). It may breed at Talbert Marsh, just northwest of the HBEP site. It also breeds in other wetland habitats in the regional vicinity including the Bolsa Chica wetlands, Seal Beach National wildlife refuge, the upper Newport Bay Ecological Reserve, the San Joaquin Freshwater Marsh Reserve, and Huntington Beach Wetlands Complex (Zembal et al. 2010; Zembal and Hoffman 2012).

The coastal wetland habitat in Magnolia Marsh, immediately adjacent to the proposed project site, was recently restored in 2010 as part of the Huntington Beach Wetlands Complex restoration plan. The light-footed clapper rail is expected to forage there, and the restored marsh will gradually develop more suitable breeding habitat as dense cordgrass and shallow water and mudflat foraging habitat are established within the marsh (Zembal 2013). Although it is not likely to occur on the HBEP site, the local breeding population is likely to expand into the adjacent Magnolia Marsh over the next several years as the habitat continues to establish.

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. The range of the Pacific coast breeding population of the western snowy plover 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. 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. 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 2007b).

The final rule for USFWS revised designated critical habitat for western snowy plover was published on June 19, 2012 (USFWS 2012), and includes the Bolsa Chica State Beach (subunit CA 46A) and Bolsa Chica Preserve (subunits CA 46B-F), and the Santa Ana River Mouth (Subunit CA 47A). The subunit CA 46A at Bolsa Chica State Beach was occupied at the time of listing, is currently occupied, and supported an average wintering flock of 27 western snowy plover from 2003 through 2010 (USFWS 2012). The subunit annually supports 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.

The Bolsa Chica Reserve subunits (subunits CA 46B–F) are located east of the Highway 1 in Orange County. They consist of 475 acres, all of which are owned by the State of California. Bolsa Chica Reserve contains significant nesting areas, and this location supported 47 breeding adult western snowy plover in 2009 (Knapp and Peterson, 2009). These subunits were occupied at the time of listing, are currently occupied, and annually support one of the largest breeding populations of western snowy plover in the region. The Recovery Plan for the western snowy plover states that this location contributes to the conservation goal for the region by providing a management potential of 70 breeding birds (USFWS 2007b). This location supported an average wintering flock of 14 western snowy plover from 2003 through 2010 (USFWS 2012). This reserve is an active oil field that underwent significant reconstruction and restoration between 2004 and 2006, including the addition of three new nest sites and a new ocean inlet that allows the water level to rise and fall resembling the irregular semi-diurnal tidal range of southern California’s ocean waters (Knapp and Peterson 2009). This location contains the physical or biological features essential to the conservation of the species, including tidally influenced estuarine mud flats supporting small invertebrates, and seasonally dry ponds that provide nesting and foraging habitat for western snowy plover.

Unit CA 47 at the Santa Ana River Mouth is the closest critical habitat unit to the HBEP site (1.5 miles away). This unit consists of 19 acres and was not occupied at the time of listing. However, the USFWS considers this unit essential for the conservation of the species based on the fluctuating use of areas by the species as a response to habitat and resource availability. The unit is located adjacent to currently occupied areas and provides dispersal habitat between units. It provides habitat to support breeding plovers and will facilitate interchange between otherwise widely separated units (USFWS 2007b). This location has a wide sandy beach with surf-cast wrack supporting small invertebrates, and tidally influenced estuarine mud flats that provide nesting and foraging habitat for western snowy plover.

The western snowy plover is reported to regularly utilize coastal salt marsh habitats in the vicinity of the HBEP site for foraging and loafing (Merkel & Associates 2004). Historically, the western snowy plover bred along the beach from Upper Newport Bay to Anaheim Bay. The species has been reported approximately 0.6 mile from the proposed HBEP site utilizing the coastal salt marshes in the vicinity of the site for foraging and loafing (CDFW 2013).

Invertebrates

Wandering Skipper

The wandering skipper (*Panoquina errans*) is California Species Concern. It is a small butterfly measuring approximately 0.5 inch, which is associated with moist salt grass vegetation along the upper margins of coastal salt marshes. It is identifiable by its rich dark brown color and cream-colored spots on the dorsal forewing. The wandering skipper is found only along the coast in southern California, Baja California and northwestern mainland Mexico. Populations have been recorded from Huntington Beach, Upper Newport Bay, and Capistrano Beach. This species has been observed in the coastal salt marshes in the immediate vicinity of the HBEP site (Merkel & Associates 2004).

Mammals

Western Mastiff Bat

The western mastiff bat (*Eumops perotis californicus*) is a California Species of Special Concern that roosts in high buildings, forages in a variety of habitats. Historic CNDDB records were reported from 1949 in Santa Ana, approximately 9 miles from proposed HBEP site. The species has a potential to forage over the open water and wetlands and around the site and has been observed Huntington Beach Central Park.

Hoary Bat

The hoary bat (*Lasiurus cinereus*) does not have a specific conservation status at the federal, state, or local level, but it is tracked in the CDFW's CNDDB. It occurs throughout California, wintering along the coast and in southern California and breeding inland and north of the winter range. The hoary bat primarily feeds on moths, and it forages in a variety of habitats. It roosts in dense foliage of medium to large trees. The hoary bat migrates over long distances, and the sexes migrate separately. During migration, males are found in foothills, deserts, and mountains, and females are in lowlands and coastal valleys (CDFG 2005). The hoary bat may forage over wetlands in the project region, and there is one historic record of this species from Newport Beach in the CNDDB.

JURISDICTIONAL WETLANDS AND WATERS

The project area is actively maintained to facilitate operation of existing power generation and therefore does not support wetlands of other waters potentially under the jurisdiction of USACE, CDFW, and/or the California Coastal Commission (CCC). The fuel oil containment basin associated with Unit 5 of the existing Huntington Beach Generating Station is identified by the National Wetland Inventory (NWI) as PUBFx, a palustrine system with an unconsolidated bottom, which is semi-permanently flooded and has been excavated (USFWS 2013). The applicant delineated the potential wetland within the containment basin and found that it did not meet any of the three parameters for classification as a wetland (i.e., presence of hydrophytic vegetation, substrate is predominately undrained hydric soil, and substrate saturated with water or covered by shallow water at some time during the growing season of each year) (HBEP 2013a). Staff confirmed this condition during its site visit.

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 HBEP 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

In order to avoid or minimize potentially adverse impacts to biological resources, staff recommends that a Designated Biologist and Biological Monitor(s) be employed to ensure impact avoidance and minimization measures described below and protection of sensitive biological resources described above are implemented. The selection criteria and minimum qualifications of the Designated Biologist and Biological Monitor(s) are described in staff's proposed Conditions of Certification **BIO-1** (**Designated Biologist Selection**) and **BIO-3** (**Biological Monitor Selection).** The duties and authority of the Designated Biologist and Biological Monitor are described in staff's proposed Condition of Certification **BIO-4** (**Designated Biologist and Biological Monitor Authority**). The Designated Biologist and/or Biological Monitor would be responsible, in part, for developing and implementing the Worker Environmental Awareness Program (WEAP) (see Condition of Certification **BIO-5**), which is a mechanism for training the on-site project construction and maintenance personnel and as well as project site visitors on the how to protect sensitive biological resources and the consequences of non-compliance.

Staff's proposed Condition of Certification **BIO-6** (**Biological Resources Mitigation Implementation and Monitoring Plan (BRMIMP)**) requires 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.

CONSTRUCTION AND DEMOLITION IMPACTS AND MITIGATION

Construction and Demolition Impacts to Native Vegetation

Construction and demolition 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 area. Construction and demolition activities would require the removal of weedy vegetation. Some ornamental plantings (landscaping) would be replaced by new plantings as part of a visual screening landscape plan, which is currently being developed by the applicant and the city of Huntington Beach in coordination with the Energy Commission (refer to the **VISUAL RESOURCES** section for additional information). Significant impacts to native vegetation would not occur and no mitigation is proposed.

Construction and Demolition Impacts to Common Wildlife

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

The proposed project area provides suitable nesting habitat for a variety of common bird species. Birds could nest in the ornamental plantings along the perimeter of the HBEP site. Additionally, some bird species adapted to disturbed environments could nest in equipment or other available substrate in the areas within the HBEP site. The compacted dirt and sparse vegetation associated with the barren areas of the HBEP provide nesting substrate for small songbirds and some ground-nesting species (e.g., killdeer). Many adult birds would flee 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 also protected by the MBTA and Fish and Game Code Sections 3503 and 3513. If initial 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.

The applicant has proposed to conduct a preconstruction active nest survey and, if determined necessary, monitor active nests during construction/demolition activities (HBEP 2012a; p. 5.2-38). Staff agrees with the need for preconstruction nest surveys and has incorporated this into Condition of Certification **BIO-8** (Preconstruction Nest Surveys and Impacts Avoidance and Minimization Measures for Breeding Birds). This condition would require a survey for birds in advance of work conducted between February 1 and August 31 and establishment of a no-disturbance buffer if a nest is identified. Additionally, general measures presented in Condition of Certification **BIO-7** (Impact Avoidance and Minimization Measures) (e.g., limit disturbance areas) would avoid and minimize impacts to nesting birds. With implementation of Conditions of Certification **BIO-7** and **BIO-8**, no significant impacts to nesting birds would result from proposed project construction and demolition activities and the project would comply with MBTA and California Fish and Game Code.

Wildlife could become entrapped in open trenches during construction, especially if trenches remain open during inactive construction periods. Staff recommends Condition of Certification **BIO-7**, 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.

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

Construction and Demolition Impacts to Special-Status Plant Species

Special-status plants recorded within one mile of the proposed HBEP site and offsite laydown area include southern tarplant (CRPR 1B.1), southwestern spiny rush (CRPR 4.2), and Salt Spring checkerbloom (CRPR 2B.2); see **Biological Resources Table 2**. Conditions in the proposed project area are not likely to support any special-status plants, and none have been recorded at either site. The proposed HBEP site and the offsite laydown area are within existing operating power generating plants, and are entirely developed brownfield sites with no natural habitat. Rare plants occur in the marshes adjacent to the HBEP site; however, recruitment into the project site would be unlikely and limited to landscaped or unpaved areas. Ongoing maintenance of landscaped areas, including weed eradication, would prevent any rare plants that did recruit onto the site from persisting. Therefore, direct impacts to special-status plants from construction would not occur and no mitigation is proposed.

Special-status plants that inhabit the adjacent Magnolia and Upper Magnolia marshes, such as southwestern spiny rush and southern tarplant, could be indirectly impacted from runoff of sediment or toxic substances from the project site, dust, or spread of invasive weeds during construction and demolition. These potential impacts are discussed under “General Construction and Demolition Impacts,” below.

Construction and Demolition Impacts to Special-Status Wildlife

Wildlife habitat in the project area has been significantly fragmented by urban development. The HBEP site, offsite laydown area at the Alamitos Generating Station, and the offsite parking areas near the HBEP site are located in developed areas; therefore, there would be no direct impacts resulting from disruption of wildlife movement, or habitat loss or fragmentation. Although not recorded on site, the monarch butterfly could roost in landscaping trees on the HBEP site. However, given the low probability of this occurring, impacts to monarch butterflies are less than significant and mitigation is not warranted.

Although most special-status wildlife species are not expected to occur at the project site or offsite parking and laydown areas, several may forage, roost, or breed in nearby marshes including the wandering skipper, hoary bat, and western mastiff bat as well as a variety of birds. Indirect impacts could occur to special-status wildlife in the marshes adjacent to and near the HBEP site during construction and demolition. These include disturbance from noise, and lighting, as well as degradation of habitat from invasive weeds, stormwater runoff, or groundwater contamination. These impacts are discussed under “General Construction and Demolition Impacts,” below.

Nesting special-status birds in the adjacent Upper Magnolia and Magnolia marshes could be disturbed by construction and demolition impacts detailed in the following subsections. The state-listed Belding’s savannah sparrow has been documented breeding in adjacent marshes, and the local breeding population of light-footed clapper rail (federally and state-listed) may expand its range from area marshes into the adjacent Magnolia Marsh as the post-restoration marsh continues to establish and develop. Condition of Certification **BIO-8** applies specifically to breeding birds and requires pre-construction surveys. Where pre-construction surveys identify breeding birds, this condition of certification requires establishment of a buffer around the nest site(s). Focused surveys for light-footed clapper rail in Upper Magnolia and Magnolia marshes would be required during the breeding season immediately preceding the initiation of construction and demolition to identify whether the species has established in the marsh. If light-footed clapper rail is present, the project owner would notify the CPM and would consult with the USFWS for incidental take authorization. Implementation of this condition of certification would reduce impacts to special-status breeding birds to less than significant.

Construction and Demolition Impacts to Jurisdictional Wetlands and Waters

The proposed HBEP would not result in direct loss or fill of any jurisdictional wetlands or waters, as there are none present within the project area.

The proposed HBEP site and offsite laydown area are immediately adjacent to Magnolia Marsh and Los Cerritos wetlands, respectively, which are jurisdictional estuarine and marine wetlands as determined during permitting for prior restoration activities. Indirect impacts may result if construction contaminants, sediment, or untreated stormwater effluent from the proposed project area enter these sensitive areas. The applicant has committed to implementing Best Management Practices (BMPs) to control site runoff during construction and demolition activities in accordance with the project's Stormwater Pollution Prevention Plan (SWPPP); this requirement is subsumed as a requirement of Condition of Certification **SOIL&WATER-1**. With implementation of these measures, indirect water quality impacts to adjacent wetland habitats would be less than significant.

General Construction and Demolition Impacts

Noise

Noise from construction and demolition 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 present in the adjacent Huntington Beach Wetlands Conservancy's Coastal Marsh Restoration Complex (Magnolia Marsh, Brookhurst Marsh, Talbert Marsh, and Newland Marsh) may be impacted by construction and demolition noise. These marshes support a variety of special-status birds including the Belding's savannah sparrow (state-listed endangered), light-footed clapper rail (federally and state-listed endangered, fully protected), western snowy plover (federally listed threatened), California least tern (federally and state-listed endangered), and California brown pelican (state fully protected). Another location with noise-sensitive biological resources is the Wildlife Care Center, which houses rehabilitating birds and wildlife in open air enclosures adjacent to the proposed HBEP site.

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)	Approximate distance from Power Block 1 (feet)	Construction Noise Level[1]
Wetland pier within Magnolia Marsh (M5)	62[2]	300	Average: greater than 70 dBA (Leq)[5], Lmax is unknown Pile driving: mid-60 dBA (Leq), upper 60-dBA (Lmax)[6]
In Magnolia Marsh adjacent to HBEP (M6)	54[2]	300	Average: greater than 70 dBA (Leq)[5], Lmax is unknown Pile driving: mid-60 dBA (Leq), upper 60-dBA (Lmax)[6]
Southeastern corner of Magnolia Marsh	45[3]	1200	Average: less than 60 dBA (Leq)[7], Lmax is unknown Pile driving: less than 60 dBA (Leq), likely less than 60 dBA (Lmax)[6]
Wildlife Care Center	72[4]	300 (from Power Block 2)	Average: greater than 70 dBA (Leq)[5], Lmax is unknown Pile driving: mid-60 dBA (Leq), upper 60-dBA (Lmax)[6]
Newland Marsh	unknown	1355	Average: less than 60 dBA (Leq)[7], Lmax is unknown Pile driving: less than 60 dBA (Leq and Lmax)[6]
Brookhurst Marsh	unknown	1355	Average: less than 60 dBA[7], Lmax is unknown Pile driving: less than 60 dBA (Leq and Lmax)[6]

Leq is the noise level averaged over the daytime period. Lmax is the maximum anticipated noise level.
[1]It is anticipated that with noise reduction measures, average construction noise levels could be reduced. Staff requested revised construction noise levels that assume implementation of noise reduction measures in the PSA and at the PSA workshop, but the applicant declined to provide them. In the absence of this data, staff averaged the average construction noise levels from all construction phases as provided in HBEP 2012a, Table 5.7-7.
[2]Calculated by noise staff using HBEP 2012d
[3]Extrapolated by staff from HHM 09 in HBEP 2012d
[4]Calculated by noise staff using HHM 10 and HHM2 in HBEP 2012d
[5]70 dBA (Leq) at 375 feet from noise source
[6]Assumes use of vibratory pile driving; 68 dBA (Leq) and 71 (Lmax) at 262 feet (80 meters) from noise source (HBEP 2013m Table 1); noise staff extrapolated noise levels to approximate location
[7]57 dBA (Leq) at 1500 feet from noise source; noise staff extrapolated estimated noise levels to approximate location.

Studies have shown that elevated noise levels can affect the behavior of certain bird species and could interfere with acoustic communication (e.g., Dooling and Popper 2007). Noise may affect birds in several ways, including reducing reproductive success; raising the level of stress hormones; interfering with sleep; causing 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).

Construction and demolition noise would occur over 7 ½ years in close proximity to the Magnolia Marsh, Upper Magnolia Marsh, and Wildlife Care Center. As shown in **Biological Resources Table 3**, average levels of construction and demolition noise could exceed ambient noise levels throughout Upper Magnolia Marsh and most of Magnolia Marsh. Although maximum construction noise levels are unknown, it is assumed that they are above average (Leq) levels. Pile driving is an example of an intermittent noise that would be particularly startling and disruptive to birds. Some areas of the marshes currently experience ambient noise levels above 60 dBA (a level often used by USFWS and CDFW as a threshold for disturbance to birds); it is expected that birds present in these areas have acclimated to elevated noise. However, construction and demolition would further increase noise levels in these areas, particularly sudden loud startling noises, and could result in the effects described above. Sudden loud noises such as the ones resulting from pile driving or other loud construction activities could cause birds to flush. Flushing of nesting birds could increase the risk of predation or cause nest failure if birds repeatedly leave the nest and eggs are not properly incubated, or eggs or nestlings are knocked from the nest by a flushing parent. Foraging birds are expected to have more flexibility in avoiding areas with disruptive noise, but nesting birds would be vulnerable to these effects and take of nests protected under the MBTA and California Fish and Game Code could occur. Construction and demolition noise impacts to birds in Upper Magnolia Marsh and Magnolia Marsh could be significant without mitigation. These noise impacts would not extend to the Talbert, Newland, and Brookhurst marshes.

To mitigate noise impacts to birds, staff recommends that average construction and demolition noise must not exceed 60 dBA or 8 dBA above ambient noise levels (whichever is greater) within Upper Magnolia and Magnolia marshes during the nesting season (February 1 to August 31). This threshold is consistent with those used by noise staff to determine significance of project noise; biological resources staff believes that this threshold would ensure that loud noises that could impact breeding birds are minimized. Staff recommends Condition of Certification **BIO-9**, which requires the project owner to monitor hourly average noise levels during all pile driving activities throughout the site and all construction and demolition activities occurring within 400 feet of the fenceline between the project and the marshes during the bird breeding season for the entire construction and demolition phase. Table 5.7-7 (Average Construction Noise Levels at Various Distances) in the Noise analysis in the AFC indicates the noisiest phases of construction would average 71 dBA at 375 feet (HBEP2012a). The highest ambient noise level reported for the marshes is 62 dBA at noise monitoring location M5 (**Biological Resources Table 3**). The noise threshold for location M5 would be 70 dBA (62 dBA + 8 dBA). Because general construction and demolition noise levels could exceed the threshold for this location, staff recommends continuous noise monitoring during all construction and demolition activities occurring within 400 feet of the fenceline.

Table 5.7-8 (Noise Levels from Common Construction/Demolition Equipment at Various Distances) in the Noise analysis in the AFC presents average noise levels from various equipment that would be used during construction and demolition activities (HBEP 2012a). Pile driving is the loudest equipment identified, with typical noise levels of 104 dBA at 50 feet, 86 dBA at 375 feet, and 74 dBA at 1,500 feet. Therefore, staff recommends continuous noise monitoring during pile driving anywhere on the project site within the bird nesting season, as all work that would occur would be within 1,500 feet of the fenceline separating the project and the marshes. Continuous noise monitoring would not be required outside of the bird nesting season or when both of the following conditions are met: no pile driving is occurring and no work is occurring within 400 feet of the fenceline separating the project from Upper Magnolia and Magnolia marshes.

If noise monitoring reveals that the noise levels during construction and demolition exceed 60 dBA or ambient conditions plus 8 dBA (whichever is greater) in the Magnolia and Upper Magnolia marshes, additional noise-reducing measures would be implemented and additional noise monitoring would be conducted to verify the reduction of noise below the thresholds. The project owner would submit monthly reports throughout construction and demolition to document the results of the noise monitoring and any remedial noise-reduction actions implemented to maintain hourly average noise levels below the threshold. Implementation of this condition of certification would reduce noise impacts to birds, including special-status species, in Upper Magnolia and Magnolia marshes to less than significant.

Elevated construction and demolition noise would be a source of stress to rehabilitating wildlife at the Wildlife Care Center. As shown in **Biological Resources Table 3**, the ambient noise level at the Wildlife Care Center (300 feet from the noise source) is 72 dBA and average construction noise is expected to be 70 dBA Leq at 375 feet. It is anticipated that construction noise levels would not significantly increase above ambient levels at this location. Further, the applicant has committed to installing temporary noise shielding at the Wildlife Care Center to reduce construction noise impacts (HBEP 2013n). Impacts to rehabilitating wildlife at the Wildlife Care Center would be adverse, but less than significant.

Lighting

HBEP construction and demolition activities would typically occur between 6:00 a.m. and 6:00 p.m. Monday through Saturday; however, some limited construction activities could continue 24 hours a day and seven days a week. These would include steam blow commissioning and continuous concrete pours. Bright lighting at night could disturb the nesting, foraging, or mating activities of wildlife in the adjacent marshes 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 Huntington Beach Generating Station and traffic on Highway 1 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 applicant proposes to use task-specific lighting to the extent practicable, shield and direct lighting onsite, and use switched lighting where possible (HBEP 2012a, p. 5.13-17). These measures are incorporated into Condition of Certification **VIS-2** (refer to the **VISUAL RESOURCES** section for the full text of this condition). With implementation of these measures, impacts to wildlife from construction night lighting would be less than significant.

Construction Dust

Active soil grading would occur over a four-month period within each unit after demolition. The soil in these disturbed areas would then be exposed for an additional 38-month construction period, after which the majority of the site would be paved or occupied by the new HBEP Block 1 and 2 facilities. It is estimated that approximately one fourth of the project site would have bare soil exposure during the construction period. Disturbance of the soil's surface caused by construction traffic and other activities would result in increased wind erosion of the soil. Dust can have deleterious physiological effects on plants in the Huntington Beach Wetland complex, especially the adjacent Magnolia Marsh, and may affect their productivity and nutritional qualities. Additionally, the Los Cerritos wetlands are adjacent to the unpaved offsite laydown area, and dust generated at that site can impact plants in the wetlands. Erosion control BMPs developed in accordance with the SWPPP will be used to minimize erosion at the site during HBEP construction and demolition activities, pursuant to Condition of Certification **SOIL&WATER-1**. These erosion-control measures would maintain water quality, protect property from erosion damage, and prevent accelerated soil erosion or dust generation that destroys soil productivity and soil capacity. Typically, these measures include mulching, physical stabilization, dust suppression, berms, ditches, and sediment barriers. Upon completion of HBEP construction and demolition activities, land surfaces will be permanently stabilized.

The applicant has proposed mitigation measures to reduce the fugitive dust emissions during construction of the project (HBEP 2012a). Staff has also proposed conditions of certification to avoid and minimize impacts of dust generated by construction and demolition activities. Condition of Certification **AQ-SC3** requires specific measures to minimize fugitive dust, and Condition of Certification **AQ-SC4** requires construction monitoring for visible dust plumes and remediation measures in the event visible dust plumes are observed. With implementation of these conditions of certification, impacts to adjacent wetlands from construction-related dust would be less than significant.

Invasive Weeds

The spread of invasive weeds destroys wildlife habitat and forage, threatens endangered species and native plants, and increases soil erosion and groundwater loss. Construction activities and soil disturbance could introduce new invasive weeds to wetlands adjacent to the HBEP site, and could further spread weeds already present in the project vicinity. Wetlands adjacent to and near the project site support special-status species and other native plants and wildlife. The Magnolia Marsh, adjacent to the southeastern boundary of the project site, is undergoing restoration, which began in 2010, and is therefore particularly vulnerable to weed infestations as it is not yet fully established. Invasive weeds can easily colonize areas of disturbance and the spread of invasive plants is a major threat to biological resources in the Huntington Beach

Wetland Complex because non-native plants can displace native plants and supplant wildlife foods that are important to herbivorous species, resulting in overall habitat degradation.

No substantial invasive weed populations exist within the proposed project area. However, to avoid and minimize the spread of existing weeds and the introduction of new ones, weed management measures are proposed. Staff's proposed Condition of Certification **BIO-7** includes a number of weed prevention measures, including the requirement that vegetation and ground disturbance be limited to the minimum required for construction of the project, and that ingress/egress be only along defined routes. Stormwater runoff would be contained and prevented from draining to adjacent sensitive habitats; therefore weed propagules would be prevented from washing into the wetlands. Further, straw bales and other sediment control features will be weed free, and invasive non-native species are prohibited from being used as landscape plantings. Implementation of Condition of Certification **BIO-7** would reduce potential impacts from introduction and spread of invasive weeds into sensitive habitat to 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, marshes adjacent to the proposed HBEP site could be impacted from stormwater runoff during construction and demolition if appropriate measures are not taken to prevent water from draining off site. Toxic materials washed from the site into adjacent marshes 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. The applicant has committed to the following measures to avoid, minimize, and mitigate potential impacts from construction and operational stormwater runoff (HBEP 2012c):

- The project owner shall not allow water containing mud, silt, or other pollutants from grading, aggregate washing, or other activities to enter the adjacent wetlands or be placed in locations that may be subjected to high storm flows.
- Spoil sites shall not be located within drainages or locations that may be subjected to high storm flows, where spoil has the potential to be washed back into the adjacent wetlands.
- Raw cement/concrete or washings thereof, asphalt, paint or other coating material, oil or other petroleum products, or any other substances that could be hazardous to vegetation or wildlife resources, resulting from project-related activities, shall be prevented from contaminating the soil and/or entering the adjacent wetlands. These materials, placed within or where they may enter the adjacent wetlands by the project owner or any party working under contract or with the permission of the project owner shall be removed immediately.

- No broken concrete, debris, soil, silt, sand, bark, slash, sawdust, rubbish, cement or concrete or washings thereof, oil or petroleum products, or other organic or earthen material from any construction or associated activity of whatever nature shall be allowed to enter into, or placed where it may be washed by rainfall or runoff into, the adjacent wetlands.
- When construction is completed, any excess materials or debris shall be removed from the work area. No rubbish shall be deposited within 200 feet of the adjacent wetlands.
- No equipment maintenance shall occur within 200 feet of the adjacent wetlands where petroleum products or other pollutants from the equipment may enter these areas under any flow condition.

In addition, staff's proposed Condition of Certification **BIO-7** (**Impact Avoidance and Minimization Measures**) would require standard BMPs from the project SWPPP to be implemented during all phases of the proposed project to control storm water runoff. BMPs include installation of silt fencing, berms, hay bales, and detention basins to control runoff from construction and demolition areas. Sediment barriers such as straw bales or silt fences would be installed to slow runoff and trap sediment. Only certified weed free materials will be used for erosion control. Staff also proposes Condition of Certification **SOIL&WATER-1,** in which the project owner would be required to develop and implement a site-specific construction SWPPP. With implementation of these measures and the applicant's commitment to the impact minimization measures listed above, project impacts to biological resources from stormwater runoff would be less than significant.

Groundwater Contamination

Groundwater was observed during exploratory borings for the project at a depth of approximately 14 feet. The observed groundwater depths are not considered stabilized groundwater depths. The California Geologic Survey Seismic Hazard Zone report for this area indicates that the historic high groundwater in the vicinity of the site is approximately 3 feet below the ground level. Groundwater underlying the project site has been documented to be impacted by metals, volatile organic compounds, and 1,4-dioxane from current and past industrial operations at this location (HBEP 2012c). Therefore, marshes adjacent to the proposed HBEP may already be exposed to this contamination. If groundwater were contaminated by HBEP construction activities (including spills of toxic materials from equipment leakage), adverse effects to vegetation and wildlife in the adjacent Magnolia and Newland Marshes could occur. Such construction impacts would be minimized through implementation of a SWPPP and associated BMPs (pursuant to Condition of Certification **SOIL&WATER-1)**. Implementation of Condition of Certification **SOIL&WATER-1** would minimize or avoid the potential for adverse impacts to vegetation and wildlife in adjacent marshes from groundwater contamination and this impact would be less than significant.

OPERATION IMPACTS AND MITIGATION

Noise

The proposed HBEP is on an industrial site that is currently occupied by the Huntington Beach Generating Station and is near other industrial land uses and Highway 1. However, it is also located adjacent to sensitive biological resources including marshes supporting special-status birds, and the Wetlands and Wildlife Care Center, which houses rehabilitating wildlife in open air enclosures. The existing Huntington Beach Generating Station, 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 applicant's Figure DR PYLE 6-1 (Estimated HBEP Operational Sound Level Contours), which was independently verified by Energy Commission noise staff, estimated operational noise from the HBEP would be between 65 and 47 dBA at Upper Magnolia and Magnolia marshes (HBEP 2012d). At the wetland pier within Magnolia Marsh (sound monitoring location M5) operational noise is estimated to be 59 dBA. At the HBEP boundary adjacent to the marsh (sound monitoring location M6) operational noise is estimated to be 57 dBA. This represents a three dBA decrease at M5 and a three dBA increase at M6 above ambient conditions, although neither would be above 60 dBA which is a threshold often used by USFWS and CDFW for impacts to listed species. In the marsh area immediately adjacent to the HBEP boundary, operational noise would be above 60 dBA but below current ambient levels. Staff's proposed Condition of Certification **VIS-2** would require an 8-foot-tall solid masonry wall to be constructed along the project boundaries adjacent to the marshes and the Wetlands and Wildlife Care Center, with additional vegetation screening to 12 to 15 feet high. This would further reduce operational noise impacts from the project. Operational noise impacts to wildlife within Upper Magnolia and Magnolia marshes would be less than significant.

The operational noise level at the Wildlife Care Center is estimated to be between 67 and 69 dBA. As presented in **Biological Resources Table 3**, the ambient noise level is estimated to be 72 dBA. Because the operational noise level is less than the ambient noise level, operational noise impacts to rehabilitating wildlife at the Wildlife Care Center would be less than significant. In addition, staff's recommended Condition of Certification **NOISE-2** would establish a noise complaint registration and resolution process that can be used by the Wildlife Care Center personnel.

Lighting

The existing Huntington Beach Generating Station and vehicles traveling on Highway 1 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 in the adjacent marsh 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.

The applicant states that operational lighting for the proposed HBEP may be slightly less than that of the existing Huntington Beach Generating Station (HBEP 2012a; p 5.13-17). To minimize backscatter of light to the sky and ensure that lighting does not obtrude beyond the project site, staff proposes Condition of Certification **VIS-3** (refer to the **VISUAL RESOURCES** section for the full text of this condition). Impacts to wildlife from proposed operation night lighting are potentially adverse, but less than significant.

Avian Collision and Electrocution

The marshes adjacent to the HBEP site are concentration areas for resident and migratory birds because of abundant foraging opportunities and proximity to the Pacific Ocean. This concentration of birds creates the potential for direct impacts through collision or electrocution with proposed HBEP facilities and appurtenant structures including transmission lines and transmission support structures.

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 HBEP transmission lines and 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 HBEP 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., Huntington Beach Generating Station 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.

HBEP would connect to the regional electrical grid using the existing SCE 230-kV switchyard located on a parcel owned by SCE within the existing Huntington Beach Generating Station site. No new offsite transmission lines are proposed. HBEP Blocks 1 and 2 would connect into the existing SCE switchyard via new double-circuit 230-kV lines. 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.

Osprey and other large aerial perching birds, including those afforded state and/or federal protection, are susceptible to transmission line electrocution. Because raptors and other large perching birds often perch on tall structures that offer views of potential prey, the design characteristics of transmission towers and poles are a major factor in raptor electrocutions (APLIC 2012). Electrocution occurs when a bird simultaneously contacts two energized phase conductors or an energized conductor and grounded hardware. This happens most frequently when a bird attempts to perch on a transmission tower or pole with insufficient distance between these elements.

Raptor species that use the transmission structures for nesting could be electrocuted upon landing. Further, nests may be built in areas that are susceptible to electrical charges that may result in fire as well as electrical outage. The majority of raptor electrocutions are caused by lines that are energized at voltage levels between 1-kV and 60-kV. The likelihood of electrocutions occurring at voltages greater than 60-kV is low because phase-to-phase and phase-to-ground clearances for lines greater than 60-kV are typically sufficient to prevent bird electrocution (APLIC 2006). Therefore, the new 230-kV onsite transmission lines that would connect HBEP Blocks 1 and 2 to the onsite SCE substation have a low likelihood to result in bird electrocution.

The new onsite generation tie lines, while posing a collision risk to birds, would be entirely within the developed site, near the existing transmission lines and tall generation facility structures. The new HBEP generation tie lines would not appreciably increase collision risk over baseline conditions. Additionally, the reduced height of the HBEP exhaust stacks would result in reduced collision potential. Nonetheless, because of the presence of listed species in the adjacent marshes, and the likelihood that they and other special-status birds fly over the project site en route to the marshes, staff proposes that the project owner construct the generation tie lines in accordance with Avian Power Line Interaction Committee (APLIC) standards to minimize or avoid collisions and electrocutions associated with the proposed project. With implementation of this component of Condition of Certification **BIO-7 (Impact Avoidance and Minimization Measures)**, this impact would be less than significant.

Stormwater Runoff

Stormwater runoff from open areas on the proposed HBEP site during operation would be conveyed to an onsite detention basin before discharge to the Pacific Ocean via an existing NPDES permitted outfall. Stormwater runoff would be conveyed in accordance with NPDES General Industrial Permit requirements. For more information on water quality impacts, please see the **SOIL AND WATER RESOURCES** section.

There are no creeks, drainages, wetlands, or other aquatic resources on the site. Adjacent wetlands 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 marsh lands can injure or kill wildlife and vegetation, and degrade habitat. The applicant has committed to BMPs to avoid, minimize, and mitigate potential impacts from construction and operational stormwater runoff (HBEP 2012c). These measures are described above under "General Construction and Demolition Impacts – Stormwater Runoff". In addition, staff's Condition of Certification **BIO-7** (**Impact Avoidance and Minimization Measures**) would require BMPs from the project SWPPP to be implemented during all phases of the proposed project to control stormwater runoff. BMPs include installation of silt fencing, berms, hay bales, and detention basins to control runoff from the project area. Sediment barriers such as straw bales or silt fences would be installed to slow runoff and trap sediment where necessary. Only certified weed free materials will be used for erosion control. Staff also proposes Condition of Certification **SOIL&WATER-4,** which would require the project owner to obtain a National Pollutant Discharge Elimination System permit for industrial waste and stormwater discharge to the Pacific Ocean through the existing outfall currently utilized by the Huntington Beach Generating Station. With implementation of these measures and the applicant's commitment to the BMPs described above, potential project impacts from stormwater runoff during operation 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. In the project vicinity, these communities include coastal dunes, chaparral, coastal sage scrub, oak woodlands, and vernal pools (Weiss 2006).

Critical habitat for the coastal California gnatcatcher, San Diego fairy shrimp, and western snowy plover are located in the vicinity of the HBEP. Protected areas and wetlands also occur in the region, including the Huntington Beach Wetlands Conservancy, Talbert Nature Preserve, Laguna Coast Wilderness Park, San Joaquin Freshwater Marsh Reserve, Seal Beach National Wildlife Refuge, and Bommer Canyon Open Space Preserve. These protected areas support state and federally listed species, including San Diego fairy shrimp (federally listed endangered), western snowy plover (federally listed threatened), light-footed clapper rail (federally and state-listed endangered), Belding's savannah sparrow (state-listed endangered), and California least tern (federally and state-listed endangered).

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). Proliferation of weedy species and type conversion of coastal sage scrub to nonnative grasslands are factors that have contributed to the coastal California gnatcatcher's decline, and prevention of type conversion and habitat degradation are priorities for the recovery of the species (USFWS 2007a). San Diego fairy shrimp are vulnerable to grass invasions that shorten the inundation periods of vernal pools (Weiss 2006).

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" (i.e., the threshold nitrogen deposition rate which causes 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 kg/ha/yr, with relatively limited invasions at levels of 4 to 5 kg/ha/yr (Weiss 2006). Critical loads in habitats affected by HBEP emissions may range from 7.8 to more than 100 kg/ha/yr (Pardo et al. 2011). 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 using data from 2002 (Tonneson et. al. 2007); results showed that most of California experiences elevated rates of annual nitrogen deposition, especially near urban areas. Modeled baseline nitrogen deposition rates in protected areas in the project region range from 1.65 to over 15 kg/ha/yr. Baseline nitrogen deposition rates in critical habitat in the region were estimated to be as follows in 2002 (GIS data from Tonneson et. al. 2007).

- California gnatcatcher critical habitat: 2.07 to 15.01 kg/ha/yr
- San Diego fairy shrimp critical habitat: 2.07 to 13.45 kg/ha/yr
- Western snowy plover critical habitat: 1.66 to 11.09 kg/ha/yr

In its revised response to Data Requests 23-26, the applicant modeled project-specific and cumulative nitrogen deposition rates (HBEP 2013o). Staff performed an independent assessment of the data's accuracy, including modeling, to verify the applicant's results. In the Focused Supplemental Analysis to the PSA, staff presented its preliminary analysis of nitrogen deposition impacts from the proposed HBEP. Staff determined that significant impacts would occur in limited protected areas in the project vicinity, but disclosed that the evaluation included several conservative estimates. Namely, staff made the following conservative assumptions:

- In protected areas that support a variety of vegetation types, staff applied the critical load (CL) of the most sensitive vegetation type (lowest applicable CL) as the threshold for determining significance of impacts. However, the vegetation type with the lowest CL may only be a small percentage of a given protected area evaluated although this level was applied to the entire area as the threshold for significance.
- Where a range of CL values were reported in the literature for a given vegetation type, staff used the lowest reported CL.
- The current operating Huntington Beach Generating Station emissions are not known, and were therefore not subtracted from the predicted emissions of the proposed HBEP.

In areas where the assumed CL was predicted to be exceeded, the project's relative contribution to nitrogen deposition was calculated to determine mitigation in the form of weed abatement funding. In all areas where the CL was determined to be exceeded, this was because the estimated baseline nitrogen deposition levels were already above the assumed CL. The project's modeled contribution to nitrogen deposition did not cause the CL to be exceeded in any areas; instead, the modeled contribution was identified as additional nitrogen contribution to areas where modeled nitrogen deposition was already above the CL.

The applicant submitted comments on the Focused Supplemental Analysis regarding the conservative nature of staff's analysis of impacts from nitrogen deposition (HBEP 2014a). In addition to concerns about the estimates made by biological resources staff identified above, the applicant described conservative estimates incorporated in the modeling used to generate predicted emissions from the proposed HBEP and argued that impacts would actually be less than significant. Air quality staff prepared a technical analysis of the nitrogen deposition modeling for the project and the baseline data, see **BIOLOGICAL RESOURCES APPENDIX BIO-1** of this FSA. 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 HBEP 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).

The conservatisms layered into staff's significance threshold resulted in an inaccurate conclusion that nitrogen deposition may significantly affect native vegetation and habitat. 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, staff concludes that the best available information does not support a conclusion of significant nitrogen deposition impacts from the project and that the HBEP's impacts from nitrogen deposition to federally and state-listed species are less than significant. Therefore, staff has removed the recommendation for weed abatement funding (Condition of Certification **BIO-10** in the Focused Supplemental Analysis).

CUMULATIVE EFFECTS

Cumulative effects are those that result from the incremental effects 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 effect if its effects contribute considerably to an overall cumulatively significant impact. There are currently proposed projects near the HBEP that may impact local biological resources, especially those in and near the Huntington Beach Wetlands Complex and other regional wetlands. These projects include the Poseidon Desalination Plant, Ascon Landfill Site, Newland Street widening project, P2-92 Sludge Dewatering and Odor Control, and the Brightwater Project.

Due to ongoing operation of the Huntington Beach Generating Station, the proposed HBEP site is highly disturbed, is devoid of natural vegetation, and does not provide suitable habitat for special-status species. The Poseidon Desalination Plant is an unrelated project that is planned on a portion of the Huntington Beach Generating Station property. As with the HBEP, the Poseidon Desalination Plant would not be likely to have direct effects to special-status species or other biological resources, as special-status species are unlikely to occur on this industrial brownfield site. However, construction of the proposed project and the Poseidon project may overlap, and cumulative indirect effects to sensitive biological resources and special-status species could occur. These cumulative effects could include disruption from lighting, spread of invasive weeds, and stormwater runoff. Implementation of Conditions of Certification **BIO-1** through **BIO-7** would minimize or avoid construction-related impacts from lighting, spread of invasive weeds, and stormwater runoff from the HBEP, and the Poseidon project would be required to implement similar measures (City of Huntington Beach 2005). Once operational, the HBEP would not result in a substantial change from baseline conditions for most biological resources. Operational noise and nitrogen deposition impacts would not differ substantially from baseline conditions, and the HBEP's contribution to these would not be cumulatively considerable.

Noise from the aforementioned projects may combine with HBEP construction and demolition noise to result in cumulative impacts to birds within the Upper Magnolia and Magnolia marshes. Condition of Certification **BIO-9** requires the project owner to take noise measurements during construction and demolition activities. Pursuant to this condition, noise reduction measures must be implemented to reduce project noise to acceptable levels (i.e., 60 dBA or ambient plus 8 dBA, whichever is greater, in the adjacent marshes). With implementation of Condition of Certification **BIO-9**, the proposed HBEP's contribution to noise impacts at locations with noise-sensitive biological resources would not contribute considerably to cumulative effects.

In conclusion, the proposed HBEP would not contribute considerably to cumulative effects to biological resources.

FACILITY CLOSURE

When the HBEP 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. 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 staff's proposed Condition of Certification **BIO-6.**

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 applicant has committed to developing a decommissioning plan that would be submitted to the Energy Commission for approval prior to decommissioning (HBEP 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 be likely to result in similar types of impacts to biological resources as construction and demolition. It is anticipated that conditions of certification similar to **BIO-1** through **BIO-9** 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. Applicable LORS are described in **Biological Resources Table 1**.

With implementation of staff's proposed conditions of certification, the proposed HBEP would comply with LORS pertaining to biological resources. Condition of Certification **BIO-8** would require focused surveys for the state and federally listed endangered light-footed clapper rail in the adjacent Magnolia and Upper Magnolia marshes, and consultation with USFWS if found. The clapper rail has not been observed in the area, had not been reported there as of the date of the AFC, and therefore clapper rail presence is not a part of the baseline condition according to CEQA. Project-related impacts (if any) to light-footed clapper rail would not be significant as defined under CEQA. However, if it inhabits the marsh prior to project commencement it could be adversely affected by construction and demolition noise; these impacts, should they occur, could constitute take as defined by the federal Endangered Species Act (ESA). Condition of Certification **BIO-8** would avoid impacts such that unauthorized take would not occur and compliance with the federal ESA would be ensured. While the light-footed clapper rail is also listed under the California Endangered Species Act (CESA), take is defined differently under CESA and project-related disturbance and noise would not constitute take. Take is defined in Section 86 of the Fish and Game Code as "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill," but does not include indirect effects such as harassment.

The proposed project would not result in loss or fill of wetlands or waters of the U.S or state, as there are none present on site. Indirect impacts resulting from degradation of adjacent wetlands and 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-4**, and **BIO-7**. These conditions would ensure compliance with the federal Clean Water Act, California Fish and Game Code 1600 et seq., California Coastal Act, and the Porter Cologne Water Quality Act by requiring control of runoff from the project area and operational discharges to be treated in accordance with NPDES permit requirements.

NOTEWORTHY PUBLIC BENEFITS

The HBEP would not use ocean water for cooling, as is currently in use for the Huntington Beach Generating Station. Therefore, the HBEP would eliminate the potential for entrainment of aquatic species. In addition, there would be a decrease in discharge via the existing NPDES-permitted outfall compared with current levels. For the site monthly maximum average ambient temperature conditions, discharge to the existing outfall would be approximately 29 gallons per minute or approximately 11.6 million gallons per year, compared to approximately 98 billion gallons per year from the existing Huntington Beach Generating Station. The reduction in outfall discharge into the Pacific Ocean and the elimination of impingement and entrainment of marine organisms are noteworthy environmental public benefits.

PUBLIC AND AGENCY COMMENTS

SCOPING COMMENTS

The following is a summary of scoping comments addressing biological resources received on the HBEP from 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.

California Coastal Commission; August 3, 2012; TN#66483

The Coastal Commission requested additional information on biological resources beyond what was included in the AFC, as well as additional information about project-related noise on nearby sensitive species. It also recommended exploring alternative site layout arrangements to locate high noise-generating equipment farther from the adjacent wetlands to minimize impacts to sensitive birds that breed nearby.

U.S. Fish and Wildlife Service; September 10, 2012; TN#67075

The USFWS commented on listed and other sensitive species that utilize the Huntington Beach Wetlands, including the light-footed clapper rail and Belding's savannah sparrow. The USFWS identified potential impacts to sensitive species and suggested measures to avoid or minimize impacts from construction disturbance, noise, lighting, dust, trash (especially attraction of crows, which are predators of the least tern that nests nearby), site runoff, and nitrogen deposition.

Residents for Responsible Desalination, Huntington Beach, CA; September 17, 2012; TN#67170

The commenter expressed concern that noise generated by the HBEP, combined with noise from the Poseidon Desalination Plant proposed at the same site, would affect nesting birds.

Huntington Beach Wetlands Conservancy; December 3, 2012; TN#68793

The Conservancy explained that its Wetlands & Wildlife Care Center is immediately south of the proposed project. The property houses an interpretive and education center and a regional wildlife care facility for the treatment of sick and injured wildlife. The Conservancy expressed concern that noise and vibration from the demolition and reconstruction of the HBEP would adversely affect wildlife at the facility, which is housed in outdoor cages, and may disrupt use of its interpretive center. The Conservancy requested that noise be minimized and that mitigation measures should be required to address these concerns. The Conservancy also described the future condition at Upper Magnolia Marsh (when it is fully restored) and requested that impacts on this wetland area be addressed.

City of Huntington Beach; December 6, 2012; TN#68804

The City of Huntington Beach clarified details about the California least tern nesting location at Huntington Beach State Park, stated that the list of LORS in AFC Table 5.2-1 does not mention the required 100-foot buffer from environmentally sensitive habitat, and corrected the site designation in the Huntington Beach General Plan that was misidentified in the AFC Biological Resources chapter. The City also identified several policies, standard plans, and development and use requirements excerpted from the City of Huntington Beach Zoning & Subdivision Ordinance and Municipal Codes and noted that this list is in addition to any "conditions of approval" that might be adopted by the City Planning Commission but for the California Energy Commission's permit process.

COMMENTS ON THE PSA AND SUPPLEMENTAL FOCUSED ANALYSIS

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

Stoel Rives, LLP; November 7, 2013; TN#201142 – Comments on the PSA Part A

Comment: The applicant raised multiple concerns with the analysis of noise-related impacts to wildlife in the adjacent wetlands and the Wildlife Care Center. These include improper use of the term "sensitive receptor" with regard to the Wetlands and Wildlife Care Center and the applicant's assertion that project noise will not significantly affect wildlife in the adjacent wetlands because the wetlands are recently restored and few special-status species have been documented there to date, high levels of ambient noise currently exist, and noise minimizing strategies will be employed during construction.

Response: Staff has removed reference to the Wetlands and Wildlife Care Center as a "sensitive receptor"; however, staff believes that wildlife in the adjacent wetlands are sensitive to noise. The analysis of construction and demolition noise impacts to biological resources has been revised in this FSA to reflect public workshop discussions with the applicant regarding this issue.

Comment: The applicant suggested several revisions to staff's proposed Conditions of Certification.

Response: These proposed revisions were generally minor clarifications that did not change the intent of the conditions, and staff accepted most of the proposed revisions.

Stoel Rives, LLP; December 13, 2013; TN#201437 – Applicant's Follow-up to PSA Part A Workshop

Comment: The applicant commented that construction and demolition noise is not expected to significantly impact light-footed clapper rail because it has not been documented in the adjacent Magnolia Marsh, and proposed avoidance measures for this species in the event it is documented nesting within the marsh.

Response: Staff has incorporated the requirement for pre-construction surveys for the light-footed clapper rail in the adjacent marsh, and consultation with the USFWS if it is found, into Condition of Certification **BIO-8**.

Comment: The applicant stated that ambient noise levels in the adjacent marshes are relatively high, and that construction noise is variable. The applicant is willing to construct temporary noise shielding to further reduce sound levels at the Wildlife Care Center during demolition and construction activities, and to develop additional noise-reduction measures as necessary.

Response: Staff has incorporated the requirement for temporary construction and demolition noise-reducing measures into Condition of Certification **BIO-9**.

Comment: The applicant suggested revisions to Condition of Certification **BIO-8** to identify specific nest buffer distances for various avian species.

Response: Staff has incorporated the requested revisions into Condition of Certification **BIO-8**.

Stoel Rives, LLP; January 21, 2014; TN#201582 – Comments on Staff's Supplemental Focused Analysis, PSA Part A

Comment: The applicant commented on several issues related to noise impacts to wildlife, including noise thresholds and measurement types identified in conditions of certification, ambient noise levels in the adjacent Magnolia Marsh, and other issues already identified in previous comment letters and public workshops.

Response: Staff and the applicant discussed these issues at the PSA Part B Workshop on April 3, 2014, and these issues have generally been resolved. The analysis of noise impacts to wildlife and the associated conditions of certification have been revised in this FSA.

Comment: The applicant argued that impacts to biological resources from nitrogen deposition are less than significant because staff's analysis in the Focused Supplemental Analysis was overly conservative, and mitigation should not be required. The applicant presented substantial evidence regarding the conservative nature of the air emissions modeling used in staff's analysis.

Response: Air Quality staff prepared a technical analysis of the nitrogen deposition modeling; see **Biological Resources Appendix BIO-1** of this FSA. Staff concurs with the applicant's assertion that impacts from nitrogen deposition were substantially overestimated in the Focused Supplemental Analysis, and that actual impacts would be less than significant. The analysis of nitrogen deposition impacts to biological resources has been revised in this FSA, and proposed Condition of Certification **BIO-10** has been removed.

Comment: The applicant suggested revisions to several conditions of certification.

Response: Staff reviewed each proposed revision, and accepted the ones that did not change the intent of the conditions or their effectiveness for reducing impacts.

Stoel Rives, LLP; April 18, 2014; TN#202108 – Applicant's Letter to Felicia Miller re Follow-Up to PSA Part B Workshop

Comment: The applicant described the results of the workshop discussion of noise impacts to wildlife and provided suggested revisions to staff's proposed Condition of Certification **BIO-8**.

Response: Staff reviewed each proposed revision, and accepted the ones that did not change the intent of the conditions or their effectiveness for reducing impacts. The applicant recommends nesting bird surveys within 100 feet of the project site; however, in its comments on the Supplemental Focused Analysis the applicant suggested a survey area of 300 feet from the project site (HBEP 2014a). Staff incorporated the 300-foot survey area into Condition of Certification **BIO-8** because staff also accepted the applicant's suggested buffers for specific common avian groups (HBEP 2013n). Some of the applicant's suggested nest buffer sizes exceed 100 feet from the nest, so surveys conducted within 100 feet of the project may miss nests that would require a larger buffer, and work may inadvertently occur within those buffers. Therefore, the 300-foot survey area would identify nests of birds that require larger buffers.

Staff's proposed Condition of Certification **BIO-8** pertains to nesting birds, and staff has proposed Condition of Certification **BIO-9** to address noise-related issues. Staff agrees with the applicant that 8 dBA above ambient average noise levels is a feasible and appropriate noise threshold, and has incorporated that threshold into the condition.

California Department of Fish and Wildlife; November 12, 2013; TN#201169

Comment: The CDFW concurred with staff's conclusions in the PSA that additional information is required from the applicant to assess the significance of noise and nitrogen deposition impacts on biological resources.

Response: This information has been received and is incorporated into the noise and nitrogen deposition analyses herein.

Comment: The CDFW recommended that biological mitigation monitoring and reporting should be of sufficient detail and resolution to satisfy the requirements of a CESA Incidental Take Permit if the project would result in take of a state-listed species.

Response: Staff has determined that the proposed HBEP would not result in take of any state-listed species. Staff's proposed impact avoidance and minimization measures for wildlife would minimize potential adverse impacts to state-listed species, even for impacts that do not meet the definition of "take" under the CESA.

Comment: The CDFW recommended considering the Remedial Action for ASCON Landfill Site in the cumulative analysis.

Response: The referenced project is considered in the cumulative impact analysis to biological resources.

City of Huntington Beach, Dept. of Planning and Building; November 13, 2013; TN#201173

Comment: The biological resources analysis should be more specific that potential 24-hour construction periods would only occur for necessary steam blow commissioning and continuous concrete pours. No other construction activity should be permitted beyond normal construction hours identified in the Noise section.

Response: The requested clarification has been made to the analysis of construction impacts above.

Huntington Beach Wetlands Conservancy; December 20, 2013; TN#201459

Comment: The Conservancy supports the proposed 8-foot masonry wall separating the Wetlands and Wildlife Care Center from the project site and temporary noise measures to lessen construction noise at the facility.

Response: The Noise and Visual Resources sections of this FSA have additional details regarding landscape plans (including a wall along the project perimeter adjacent to the Wetlands and Wildlife Care Center) and construction noise reduction measures. Staff's proposed Condition of Certification **VIS-2** would require an 8-foot-tall solid masonry wall to be constructed along the project boundary adjacent to the Wetlands and Wildlife Care Center, with additional vegetation screening to 12 to 15 feet high. The applicant's commitment to temporary noise reduction techniques at the Wetlands and Wildlife Care Center were stated in the applicant's follow-up comments to the PSA Part A Workshop (HBEP 2013n).

CONCLUSIONS

The project site and offsite laydown area are industrial brownfield sites with operating power plants, and vegetation is limited to weedy species and landscaping. Rare plants and special-status wildlife are not expected to occur on the site; however, nearby marshes and other natural areas support special-status birds including the Belding's savannah sparrow (state-listed endangered), light-footed clapper rail (federally and state-listed endangered), western snowy plover (federally listed threatened), California least tern (federally and state-listed endangered), and California brown pelican (state fully protected). Another location with sensitive biological resources is the Wildlife Care Center, which houses rehabilitating birds and wildlife in open air enclosures adjacent to the proposed HBEP site. Given the proximity of the proposed project to the aforementioned biological resources, construction and operation would result in the direct and indirect effects presented in **Biological Resources Table 4**.

Biological Resources Table 4
Summary of Impacts to Biological Resources from the HBEP

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-7** limits disturbance area; • **BIO-8** requires pre-construction nest surveys and impact avoidance.	Less than significant with implementation of conditions of certification
Special-status plants: degradation from runoff of sediment or toxic substances from the project site, damage from dust, spread of invasive weeds	• **BIO-7** controls invasive weeds; • **SOIL&WATER-1** requires a SWPPP to control runoff and prevent contamination; • **AQ-SC3** requires measures to minimize fugitive dust; • **AQ-SC4** requires construction monitoring for visible dust plumes and remediation measures in the event visible dust plumes are observed.	Less than significant with implementation of conditions of certification
Special-status wildlife: disturbance from noise and lighting, habitat degradation from invasive weeds, stormwater runoff, or groundwater contamination	• **BIO-7** confines work to delineated areas and controls invasive weeds; • **BIO-8** requires pre-construction nest surveys and impact avoidance, including focused surveys for light-footed clapper rail; • **SOIL&WATER-1** requires a SWPPP to control runoff and prevent contamination; • **VIS-2** minimizes offsite lighting; • **BIO-9** prohibits excessive noise in adjacent marshes and requires reporting to document compliance with noise thresholds.	Less than significant with implementation of conditions of certification
Jurisdictional wetlands and waters: degradation from runoff of sediment or toxic substances from the project site	• **SOIL&WATER-1** requires a SWPPP to control runoff and prevent contamination.	Less than significant with implementation of condition of certification
Noise: disturbance resulting in mortality or decreased productivity of special-status birds and rehabilitating wildlife	• **BIO-8** requires pre-construction nest surveys and impact avoidance; • **BIO-9** prohibits excessive noise in adjacent marshes and requires reporting to document compliance with noise thresholds; • **NOISE-2** establishes a noise complaint registration and resolution process that can be used by the Wildlife Care Center.	Less than significant with implementation of conditions of certification
Lighting: disturbance resulting in altered behavior or increased predation	• **VIS-2** minimizes offsite lighting.	Less than significant with implementation of condition of certification

Impact	Condition of Certification	Significance Determination
Dust: decreased plant productivity or nutritional quality	• **SOIL&WATER-1** prevents soil erosion; • **AQ-SC3** requires measures to minimize fugitive dust; • **AQ-SC4** requires construction monitoring and remediation in the event visible dust plumes are observed.	Less than significant with implementation of conditions of certification
Invasive weeds: threaten marsh restoration, destroy wildlife habitat and forage, increase soil erosion	• **BIO-7** controls invasive weeds.	Less than significant with implementation of condition of certification
Stormwater runoff: degradation of adjacent habitat	• **BIO-7** minimizes runoff; • **SOIL&WATER-1** requires a SWPPP to control runoff.	Less than significant with implementation of conditions of certification
Groundwater contamination: degradation of adjacent habitat	• **SOIL&WATER-1** prevents contamination.	Less than significant with implementation of condition of certification
OPERATION IMPACTS		
Noise: disturbance resulting in mortality or decreased productivity of special-status birds and rehabilitating wildlife	**None**	Less than significant
Lighting: disturbance resulting in altered behavior or increased predation	• **VIS-3** minimizes offsite lighting.	Less than significant implementation of condition of certification
Avian collision and electrocution: injury or mortality	• **BIO-7** minimizes risk by complying with APLIC design standards.	Less than significant with implementation of condition of certification
Stormwater runoff: degradation of adjacent habitat	• **BIO-7** minimizes runoff; • **SOIL&WATER-4** requires compliance with NPDES permit requirements for discharge.	Less than significant with implementation of conditions of certification
Nitrogen deposition: degradation of habitat by enhancing invasive weeds	**None**	Less than significant

OVERALL CONCLUSION

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

PROPOSED CONDITIONS OF CERTIFICATION

Staff proposes the following Biological Resources conditions of certification:

DESIGNATED BIOLOGIST SELECTION

BIO-1 The project owner shall assign at least one Designated Biologist to the project. The project owner shall submit the resume of the proposed Designated Biologist, with at least three references and contact information, to the Energy Commission Compliance Project Manager (CPM) for approval in consultation with CDFW and USFWS.

The Designated Biologist must meet the following minimum qualifications:

1. Bachelor's degree in biological sciences, zoology, botany, ecology, or a closely related field;

2. Three years of experience in field biology or current certification of a nationally recognized biological society, such as The Ecological Society of America or The Wildlife Society; and

3. 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, in consultation with CDFW and USFWS, 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 75 days prior to the start of site mobilization or construction-related ground disturbance activities. No pre-construction site mobilization or construction related activities shall commence until a Designated Biologist has been approved by the CPM, in consultation with CDFW and USFWS.

If a Designated Biologist is replaced, 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-2 The project owner shall ensure that the Designated Biologist performs the following during any site (or related facilities) mobilization, ground disturbance, grading, construction, operation, closure, and restoration activities. The Designated Biologist may be assisted by the approved Biological Monitor(s) but remains the contact for the project owner and CPM. The Designated Biologist Duties shall include the following:

1. Advise the project owner's Construction and Operation Managers on the implementation of the biological resources conditions of certification;

2. Consult on the preparation of the Biological Resources Mitigation Implementation and Monitoring Plan (BRMIMP) to be submitted by the project owner;

3. Be available to supervise, conduct and coordinate 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;

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

5. Inspect active construction areas where animals may have become trapped prior to construction commencing each day. Inspect or direct the site personnel how to inspect the installation of structures that prevent entrapment or allow escape during periods of construction inactivity. Periodically inspect areas with high vehicle activity (e.g., parking lots) for animals in harm's way;

6. Notify the project owner and the CPM of any non-compliance with any biological resources condition of certification;

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

8. Maintain written records of the tasks specified above and those included in the BRMIMP. Summaries of these records shall be submitted in the monthly compliance report and the annual compliance report;

9. Train the Biological Monitors as appropriate, and ensure their familiarity with the BRMIMP, Worker Environmental Awareness Program (WEAP) training, and all permits; and

10. Maintain the ability to be in regular, direct communication with representatives of CDFW, USFWS, and CPM, including notifying these agencies of dead or injured listed species and reporting special status species observations to the California Natural Diversity Database.

Verification: The Designated Biologist shall submit in the monthly compliance report to the CPM copies of all written reports and summaries that document construction activities that have the potential to affect biological resources. If actions may affect biological resources during operation the Biological Monitor(s), under the supervision of the Designated Biologist, shall be available for monitoring and reporting. During project operation, the Designated Biologist(s) shall submit record summaries in the annual compliance report unless their duties cease, as approved by the CPM.

BIOLOGICAL MONITOR SELECTION

BIO-3 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.

DESIGNATED BIOLOGIST AND BIOLOGICAL MONITOR AUTHORITY

BIO-4 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, 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 an unauthorized adverse impact to biological resources if the activities continued;

2. Inform the project owner and the construction/operation manager when to resume activities; and

3. Notify the CPM if there is a halt of any activities and advise the CPM of any corrective actions that have been taken or would be instituted as a result of the work stoppage.

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 the Designated Biologist or Biological Monitor notifies the CPM immediately (and no later than the morning following 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 would be made by the CPM within five working days after receipt of notice that corrective action is completed, or the project owner would be notified by the CPM that coordination with other agencies would require additional time before a determination can be made.

WORKER ENVIRONMENTAL AWARENESS PROGRAM (WEAP)

BIO-5 The project owner shall develop and implement HBEP-specific Worker Environmental Awareness Program (WEAP) and shall secure approval for the WEAP from the CPM in consultation with USFWS and CDFW. The WEAP shall be administered to all onsite personnel including surveyors, construction engineers, employees, contractors, contractor's employees, supervisors, inspectors, and subcontractors. The WEAP shall be implemented during site mobilization, ground disturbance, grading, construction, operation, and closure. The WEAP shall:

1. Be developed by or in consultation with the Designated Biologist and consist of an on-site or training center presentation in which supporting electronic media and written material, including wallet-sized cards with summary information on special status species and sensitive biological resources, is made available to all participants;

2. Discuss the locations and types of sensitive biological resources on the project site and adjacent areas, explain the reasons for protecting these resources, and the function of flagging in designating sensitive resources and authorized work areas;

3. Discuss federal and state laws afforded to protect the sensitive species and explain penalties for violation of applicable laws, ordinances, regulations, and standards (e.g., federal, and state endangered species acts);

4. Place special emphasis on the light-footed clapper rail, western snowy plover, California least tern and Belding's savannah sparrow, including information on physical characteristics, distribution, behavior, ecology, sensitivity to human activities, legal protection and status, penalties for violations, reporting requirements, and protection measures;

5. Include a discussion of fire prevention measures to be implemented by workers during project activities; request workers to dispose of cigarettes and cigars appropriately and not leave them on the ground or buried;

6. Present the meaning of various temporary and permanent habitat protection measures;

7. Identify whom to contact if there are further comments and questions about the material discussed in the program; and

8. Include a training acknowledgment form to be signed by each worker indicating that they received the WEAP training and shall abide by the guidelines.

The specific WEAP shall be administered by a competent individual(s) acceptable to the Designated Biologist.

Verification: At least 45 days prior to the start of any project-related site disturbance activities, the project owner shall provide to the CPM a copy of the draft WEAP and all supporting written materials and electronic media prepared or reviewed by the Designated Biologist and a resume of the person(s) administering the program. The CPM shall approve the WEAP materials prior to their use.

The project owner shall provide in the monthly compliance report the number of persons who have completed the training in the prior month and a running total of all persons who have completed the training to date. At least 10 days prior to site and related facilities mobilization, the project owner shall submit two copies of the CPM-approved final WEAP.

Training acknowledgement forms signed during construction shall be kept on file by the project owner for at least six months after the start of commercial operation.

Throughout the life of the project, the worker education program shall be repeated annually for permanent employees, and shall be routinely administered within one week of arrival to any new construction personnel, foremen, contractors, subcontractors, and other personnel potentially working within the project area. Upon completion of the orientation, employees shall sign a form stating that they attend the program and understand all protection measures. These forms shall be maintained by the project owner and shall be made available to the CMP upon request. Workers shall receive and be required to visibly display a hardhat sticker or certificate indicating that they have completed the required training.

During project operation, signed statements for operational personnel shall be kept on file for six months following the termination of an individual's employment.

BIOLOGICAL RESOURCES MITIGATION IMPLEMENTATION AND MONITORING PLAN (BRMIMP)

BIO-6 The project owner shall develop a BRMIMP and submit two copies of the proposed BRMIMP to the CPM (for review and approval) and to CDFW and USFWS (for review and comment), if applicable, and shall implement the measures identified in the approved BRMIMP. The BRMIMP shall be prepared in consultation with the Designated Biologist and shall and shall include the following:

1. all biological resource mitigation, monitoring, and compliance measures proposed and agreed to by the project owner;

2. all biological resource conditions of certification identified in the Commission Decision as necessary to avoid or mitigate impacts;

3. All biological resource mitigation, monitoring, and compliance measures required in other state agency terms and conditions, such as those provided in the National Pollution Discharge Elimination System (NPDES) Construction Activities Stormwater General Permit;

4. all sensitive biological resources to be impacted, avoided, or mitigated by project construction, operation, and closure;

5. all required mitigation measures for each sensitive biological resource;

6. a detailed description of measures that shall be taken to avoid or mitigate disturbances from construction and demolition activities;

7. all locations on a map, at an approved scale, of sensitive biological resource areas subject to disturbance and areas requiring temporary protection and avoidance during construction;

8. Aerial photographs, at an approved scale, 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.

9. Duration for each type of monitoring and a description of monitoring methodologies and frequency;

10. Performance standards to be used to help decide if/when proposed mitigation and conditions are or are not successful;

11. All performance standards and remedial measures to be implemented if performance standards are not met;

12. A discussion of biological resources-related facility closure measures including a description of funding mechanism(s);

13. A process for proposing plan modifications to the CPM and appropriate agencies for review and approval; and

14. A requirement to submit any sightings of any special-status species that are observed on or in proximity to the project site, or during project surveys, to the California Natural Diversity Database (CNDDB) per CDFW requirements.

Verification: The project owner shall provide the specified document at least 45 days prior to start of any project-related ground disturbing activities.

The CPM shall determine the BRMIMP's acceptability within 30 days of receipt. 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, the CDFW, and USFWS 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 no less than 5 working days before implementing any modifications to the approved BRMIMP to obtain CPM approval.

Any changes to the approved BRMIMP must also be approved by the CPM in consultation with CDFW, the USFWS, and appropriate agencies to ensure no conflicts exist.

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). 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 site mobilization, ground disturbance, grading, and construction phases; and which mitigation and monitoring items are still outstanding.

GENERAL IMPACT AVOIDANCE AND MINIMIZATION MEASURES

BIO-7 The project owner shall implement the following measures during site mobilization, construction, operation, and closure to manage their project site and related facilities in a manner to avoid or minimize impacts to biological resources:

1. The boundaries of all areas to be temporarily or permanently disturbed (including staging areas, access roads, and sites for temporary placement of spoils) shall be delineated with stakes and flagging prior to construction activities in consultation with the Designated Biologist. Spoils shall be stockpiled in disturbed areas, which do not provide habitat for special-status species. Parking areas, staging and disposal site locations shall similarly be located in areas without native vegetation or special-status species habitat. All disturbances, vehicles, and equipment shall be confined to the flagged areas.

2. 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.

3. Transmission lines and all electrical components shall be designed, installed, and maintained in accordance with the Avian Power Line Interaction Committee's (APLIC's) Suggested P*ractices for Avian Protection on Power Lines* (APLIC 2006) and *Reducing Avian Collisions with Power Lines* (APLIC 2012) to reduce the likelihood of large bird electrocutions and collisions.

4. Spoils shall not be stockpiled adjacent to the southeastern fence line to minimize potential for spoils to enter into adjacent wetlands.

5. Soil bonding and weighting agents used on unpaved surfaces shall be non-toxic to wildlife and plants.

6. Facility lighting shall be designed, installed, and maintained to prevent side casting of light towards the project boundaries. Lighting shall be shielded, directional, and at the lowest intensity required for safety. Lighting shall be directed away from biologically sensitive areas (e.g., Magnolia Marsh). 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.

7. 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 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.

8. 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 USFWS 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.

9. All vehicles and equipment shall be maintained in proper working condition to minimize the potential for fugitive emissions of motor oil, antifreeze, hydraulic fluid, grease, or other hazardous materials. The Designated Biologist shall be informed of any hazardous spills immediately as directed in the project Hazardous Materials Plan. Hazardous spills shall be immediately cleaned up and the contaminated soil will be properly disposed of at a licensed facility. Servicing of construction equipment shall take place only at a designated area. Service/maintenance vehicles shall carry a bucket and pads to absorb leaks or spills.

10. 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.

11. Except for law enforcement personnel, no workers or visitors to the site shall bring firearms or weapons.

12. Standard best management practices (BMPs) from the project Stormwater Pollution Prevention Plan shall be implemented during all phases of the project (construction, demolition, operation, and decommissioning) where stormwater run-off from the site could to enter adjacent marshes or channels. Sediment and other flow-restricting materials shall be moved to a location where they shall not be washed back into the jurisdictional waters. All disturbed soils within the project site shall be stabilized to reduce erosion potential, both during and following construction.

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

    a. Limit the size of any vegetation and/or ground disturbance to the absolute minimum and limit ingress and egress to defined routes;

    b. Use only weed-free straw, hay bales, and seed for erosion control and sediment barrier installations. Invasive non-native species shall not be used in landscaping plans and erosion control. Monitor and rapidly implement control measures to ensure early detection and eradication of weed invasions.

14. 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. If rodent control must be conducted, zinc phosphide or an equivalent product shall be used.

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-8 Pre-construction nest surveys shall be conducted if construction or demolition 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 the project site and areas surrounding the project site within 300 feet of the project boundary.

2. At least two pre-construction surveys shall be conducted, separated by a minimum 10-day interval. Pre-construction surveys shall be conducted no more than 14 days prior to initiation of construction activity. One survey needs to be conducted within the 3-day period 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. Specific buffer distances are provided below for applicable avian groups (**Biological Resources Table 5**). For special-status species, if an active nest is identified, 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 technology.

Biological Resources Table 5
HBEP Construction and Demolition Buffers for Active Nests

Avian Group	Species Potentially Nesting in the Project Vicinity	Buffer for Construction and Demolition Activities (feet)
Bitterns and herons	Black-crowned night heron, great blue heron, great egret, green heron, snowy egret	250
Cormorants	Double-crested cormorant	100
Doves	Mourning dove	25
Geese and ducks	American widgeon, blue-winged teal, cinnamon teal, Canada goose, gadwall, mallard, northern pintail, ruddy duck	100
Grebes	Clark's grebe, eared grebe, horned grebe, pied-billed grebe, western grebe	100
Hummingbirds	Allen’s hummingbird, Anna’s hummingbird, black-chinned hummingbird	25
Plovers	Black-bellied plover, killdeer	50
Raptors (Category 1)	American kestrel, barn owl, red-tailed hawk	50
Raptors (Category 2)	Cooper’s hawk, red-shouldered hawk, sharp-shinned hawk	150
Raptors (Category 3)	Northern harrier, white-tailed kite	These are special-status species; buffer determined in consultation with CPM
Stilts and Avocets	American avocet, black-necked stilt	150
Terns	Elegant tern, Forster's tern, royal tern	100
Passerines (cavity and crevice nesters)	House wren, Say’s phoebe, western bluebird	25
Passerines (bridge, culvert, and building nesters)	Black phoebe, cliff swallow, house finch, Say’s phoebe	25
Passerines (ground nesters, open habitats)	Horned lark	100
Passerines (understory and thicket nesters)	American goldfinch, blue-gray gnatcatcher, bushtit, California towhee, common yellowthroat, red-winged blackbird, song sparrow, Swainson’s thrush	25
Passerines (scrub and tree nesters)	American crow, American goldfinch, American robin, blue-gray gnatcatcher, Bullock’s oriole, bushtit, Cassin's kingbird, common raven, hooded oriole, house finch, lesser goldfinch, northern mockingbird	25
Passerines (tower nesters)	Common raven, house finch	25
Passerines (marsh nesters)	Common yellowthroat, red-winged blackbird	25
Species not covered under MBTA	Domestic waterfowl, including domesticated mallards, feral (rock) pigeon, European starling, and house sparrow	N/A

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 in coordination with the CPM. These measures could 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.

5. If active nests are detected during the survey, the Designated Biologist or Biological Monitor 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 or Biological Monitor, disturb nesting activities (e.g., exposure to exhaust), shall be prohibited within the buffer zone until such a determination is made.

6. Focused surveys for light-footed clapper rail will be conducted in Magnolia and Upper Magnolia Marshes by qualified biologists during the breeding season (March 1 to August 1) immediately preceding the commencement of construction and demolition activities. If breeding clapper rails are detected, the CPM will be notified and the project owner will consult with the USFWS for incidental take authorization, if required.

Verification: The project owner shall provide notification to the CPM, CDFW, and USFWS at least 2 weeks prior to initiating surveys for light-footed clapper rail; notification will include the name and resume of the biologist(s) conducting the surveys and the timing of the surveys. Prior to the start of any pre-construction site mobilization, the project owner shall provide the CPM, CDFW, and USFWS a letter-report describing the findings of the preconstruction nest surveys and the light-footed clapper rail survey, including the time, date, methods, and duration of the surveys; identity and qualifications of the surveyor(s); and a list of species observed. If active nests are detected during the surveys, the reports shall include a map or aerial photo identifying the location of the nest(s) and shall depict the boundaries of the proposed no disturbance buffer zone around the nest(s). Additionally, a nest 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; agency comments on the nest monitoring plan must be provided to the CPM in a timely manner. If light-footed clapper rails are documented breeding in Upper Magnolia or Magnolia Marshes, the project owner will notify the CPM and will consult with the USFWS for incidental take authorization. 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.

NOISE IMPACT MINIMIZATION, MONITORING, AND REPORTING

BIO-9 The project owner shall prepare and implement a Wildlife Noise Monitoring Plan throughout construction and demolition activities taking place during the bird breeding season (February 1 to August 31). Sound levels in Upper Magnolia and Magnolia marshes shall not exceed 8 dBA above ambient levels or 60 dBA (hourly average Leq), whichever is greater. Ambient levels will be established prior to initiation of construction and demolition, using the same methodology that will be used to take noise measurements during monitoring. The project owner shall document ambient noise conditions at three locations: the wetland pier in Magnolia Marsh (sound monitoring location M5), within the marsh (sound monitoring location M6), and an additional sound monitoring location to be established at the fenceline between the project site and the western boundary of the Upper Magnolia Marsh. These and prior noise data will be included in the Wildlife Noise Monitoring Plan.

Continuous noise monitoring devices will be established at each of the three (3) noise monitoring locations and will be checked daily by the Biological Monitor, Designated Biologist, or other monitor as approved by the CPM under the following conditions:

- During all construction and demolition occurring within 400 feet of the fenceline separating the project site from Upper Magnolia and Magnolia Marshes, and
- During all pile driving activities at any location on the project site.

The monitor will review the data from each noise monitoring device daily during these times and will compare it to the project's construction schedule from the time period under review. If the hourly average noise threshold is exceeded at any of the three (3) monitoring locations, and the exceedance coincides with noisy project activities, the CPM will be notified immediately and additional noise reduction techniques shall be implemented as soon as possible, in coordination with the CPM, to reduce project noise below the thresholds. Additional noise monitoring will be conducted to verify the reduction of noise levels below the thresholds. Noise reduction techniques can include, but are not limited to:

- Temporary noise barriers, sound walls;
- Use of pads or dampers;
- Reduce speed limits;
- Replace and update noisy equipment;
- During the nesting season, avoid pile driving or confine pile driving to areas of the project site furthest from the marshes;
- Moveable task noise barriers;
- Queue trucks to distribute idling noise;

- Locate vehicle access points and loading and shipping facilities away from the southern and eastern project boundaries;
- Reduce the number of noisy construction and demolition activities that occur simultaneously;
- Place noisy stationary construction equipment in acoustically engineered enclosures or relocate them away from the southern and eastern project boundaries;
- Reorient or relocate construction equipment to minimize noise at the Magnolia Marsh; and
- Perform pile driving with quieter equipment.

Noise monitoring is not required outside of the bird nesting season. During the bird nesting season, noise monitoring is not required if (1) no pile driving is occurring anywhere on site, and (2) no construction or demolition activities are occurring within 400 feet of the fenceline separating the project and the marshes.

Verification: No fewer than thirty (30) days prior to the start of construction and demolition activities, the project owner shall provide the CPM with the final version of the Wildlife Noise Monitoring Plan as reviewed and approved by the CPM. The project owner shall implement the approved Wildlife Noise Monitoring Plan during the bird breeding season (February 1 to August 31) for the duration of construction and demolition activities, which will include documentation of the hourly average noise levels (Leq) at each of the three sound monitoring locations during periods of noise monitoring. Methods, results, and any corrective measures implemented shall be reported in the monthly compliance reports by the Designated Biologist and submitted to the CPM, CDFW, and USFWS.

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BIOLOGICAL RESOURCES APPENDIX BIO-1
NITROGEN DEPOSITION ANALYSIS

Testimony of Wenjun Qian, Ph.D., P.E. and Tao Jiang, Ph.D., P.E.

INTRODUCTION

The following provides a technical description of the nitrogen deposition analysis for the Huntington Beach Energy Project (HBEP).

PROJECT DESCRIPTION

The HBEP is a proposed natural-gas fired, combined-cycle, air-cooled, 939-megawatt (MW) electrical generating facility that would replace the existing Huntington Beach Generating Station. The proposed HBEP would consist of two three-on-one combined-cycle power blocks, with three Mitsubishi Power Systems Americas (MPSA) 501DA combustion turbine generators (CTG) and associated equipment in each block.

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 NO_X 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 N 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 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 HBEP 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 Huntington Beach is less than 12 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., 1/10th) 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

Staff used AERMOD with the assumptions mentioned above to conservatively estimate nitrogen deposition impacts from power plants. For HBEP, the applicant provided an AERMOD analysis evaluating the nitrogen deposition impacts of the proposed new units at HBEP (HBEP 2013ll). Staff expanded the analysis to cover more habitat areas with the same modeling assumptions used by the applicant, and compared the modeled point-source nitrogen deposition rates for the HBEP to baseline nitrogen deposition rates (as determined by Tonnesen et al. [2007], using 2002 data).

The analysis does not account for the net benefit from the discontinuation of the existing boilers at the Huntington Beach Generating Station. Although the Huntington Beach Generating Station is currently operating, and has NOx and ammonia emission rates similar to the HBEP units, at its current capacity factors it produces only a fraction of the maximum annual nitrogenous emissions that the proposed project would be permitted to produce. But the comparison of past actual emissions to future permitted emissions is another conservative assumption, as it is unlikely that the HBEP units would ever approach their permitted level of operation as California moves to a high renewable, low carbon (greenhouse gas or GHG) electricity generation system.

Staff emphasizes that its modeling provides an overestimation of nitrogen deposition of the project, based on conservatisms layered upon conservatisms. However, it is the 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 compute the acreage of affected habitat to include map zones where the total nitrogen deposition exceeds the critical load for each vegetation type. Staff considers that map zones 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.

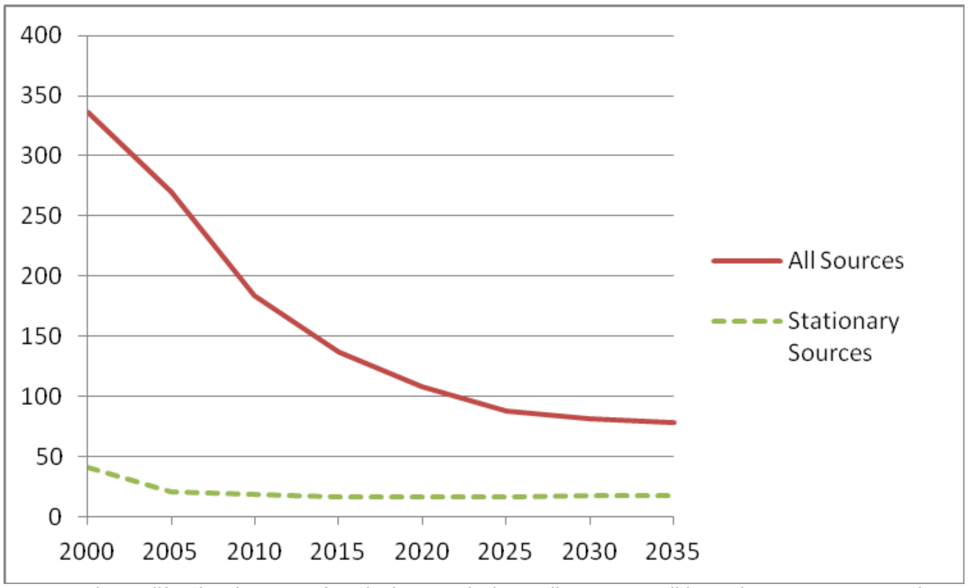
The emissions from stationary sources, including electric generation facilities, are also presented (green dashed lines) in the figures for comparison. NOx emissions from the stationary sources only account for 8 to 22 percent of those from all sources and also show a steady decrease over the years. 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 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.

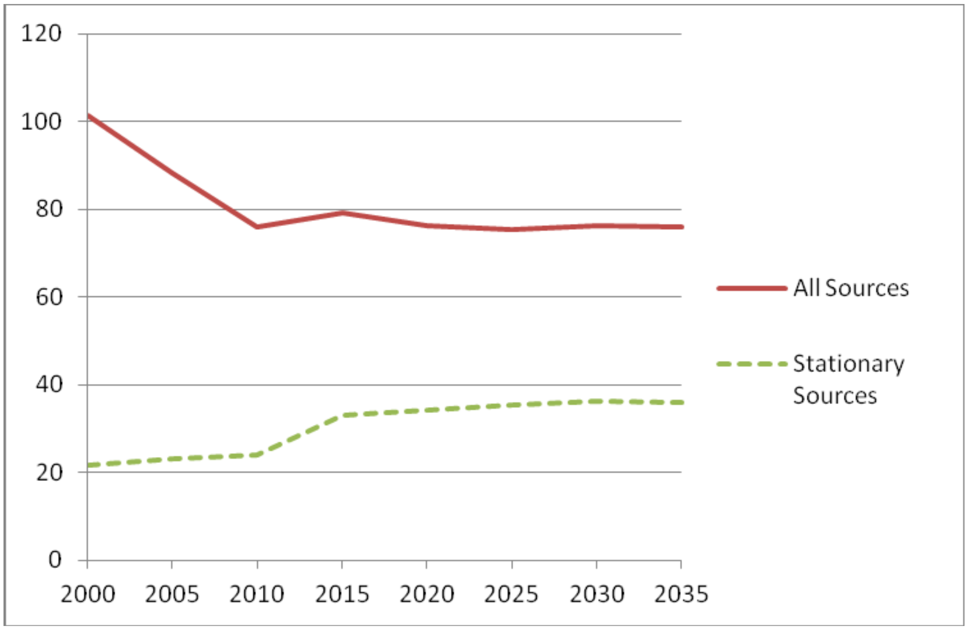
Staff assumes that total nitrogen loading is directly proportional to NOx and ammonia inventories. Since deposition pathways are complex and dependent on components such as time, humidity, sunlight exposure, and uniform mixing of needed reactants, deposition rates at the habitat areas near the project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

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



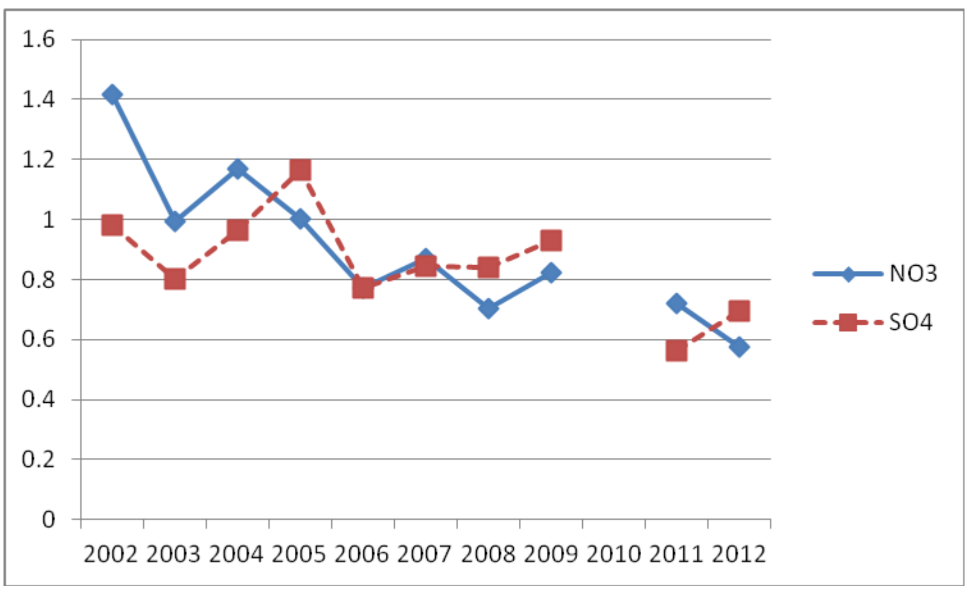
Source: The California Almanac of Emissions and Air Quality - 2013 Edition, Air Resources Board and Energy Commission staff analysis
Note: [a] The nitrogen portion of the NOx emissions is calculated based on the ratio between the molecular weight of nitrogen (14) and the molecular weight of NO_2 (46).

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 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 (μg/m^3) Measured at San Gabriel Monitoring Station



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

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 HBEP, 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 HBEP would not result in a net increase in NOx emissions basin wide (see details in the **AIR QUALITY** section regarding HBEP RECLAIM participation and compliance). In addition, since HBEP would be located in Zone 1 (South Coast Air Basin coastal zone) RTCs may only be obtained from Zone1. The resulting new emissions (potential NOx increases) from HBEP 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 HBEP.

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.

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, HBEP is required to purchase RTCs to offset their annual NOx emissions on a 1-to-1 offset ratio. HBEP 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.

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CULTURAL RESOURCES

Gabriel Roark, Thomas Gates, and Melissa Mourkas[1]

SUMMARY OF CONCLUSIONS

Staff concludes that the proposed Huntington Beach Energy Project could result in significant, direct impacts on buried archaeological resources, which may qualify as historical or unique archaeological resources under the California Environmental Quality Act. The adoption and implementation of Conditions of Certification **CUL-1** through **CUL-8** would ensure that the applicant would be able to respond quickly and effectively in what staff concludes is the potential to affect buried archaeological resources. These conditions of certification would reduce impacts to historical or unique archaeological resources to a less-than-significant level and ensure the project complies with applicable laws, ordinances, regulations, and standards (LORS).

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 assessment of project impacts on archaeological and built environment resources.

As a result of the built-environment research, staff initially concluded in the preliminary staff assessment that it is unlikely that built-environment historical resources would be impacted by the proposed project. Research by staff revealed that the Edison Plant, P-30-176946, which is located on the project site and would be demolished to accommodate the construction of the proposed project, was listed on the local register[2] by the city of Huntington Beach as a significant local landmark as a result of the 1986 Downtown Historical Study and Windshield Survey (HB 1996). However, in 2008, Galvin Preservation Associates, Inc. was contracted by the city to update and expand the city's existing 1986 Study. The findings of the most recent survey have been documented in a report, *City of Huntington Beach Historic Context & Survey Report*, and submitted to the city for their review (Galvin 2012). The latest version of this report is in its second draft and was prepared in December 2012. This 2012 survey recommends that the Edison Plant is not eligible for National Register of Historic Places, the California Register of Historical Resources, or for local listing. Additionally, it is not listed on, nor has been found eligible for, either the National Register of Historic Places or the California Register of Historical Resources in any documentation provided by the applicant or discovered by staff to date.

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

[2] "Local register" is used here and elsewhere in this document to refer to the 1996 General Plan (HB 1996), Community Development Chapter, Historic and Cultural Resources Element, Table HCR-2.

Based on the preponderance of evidence that the Edison Plant is not a historical resource under the California Environmental Quality Act, staff recommends that the Committee and Energy Commission make a determination of ineligibility for the California Register of Historical Resources. The Galvin (2012) report continues to be under consideration by a standing committee of the Huntington Beach Historic Resources Board, and no action has been taken to update the local register as of March 25, 2014[3]. While the resource remains listed on the local register, if the property was not determined historically significant by following the Office of Historic Preservation procedures and requirements (OHP 1995), it is possible that the original determination of historical significance is not detailed enough for a lead agency to determine whether the subject resource is, in fact, a historical resource for the purposes of the California Environmental Quality Act. This would most likely apply to the original 1986 study. Therefore, with the additional survey information available at this time, staff concludes that the resource listing does not conform with current OHP survey practices and was listed on the local register without the benefit of these practices. Therefore staff does not anticipate a conflict between demolition of the plant and listing on the local register. No mitigation measures are recommended for project impacts to this resource or to ensure conformance with local LORS.

INTRODUCTION

This cultural resources assessment identifies the potential impacts of the proposed Huntington Beach Energy Project (HBEP) on cultural resources. Cultural resources are defined under state law as buildings, sites, structures, objects, areas, places, records, manuscripts, and historic districts (14, Cal. Code Regs., §§5064.5[a][3], 4852a; 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 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

[3] The City of Huntington Beach Historic Resources Board meets monthly and posts meeting agendas and minutes on the city’s web site, http://www.surfcityhb.org.

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 greater than fifty years old to be considered of potential historic importance. A resource less than fifty years of age may be historically important if the resource is of exceptional importance.

For the proposed HBEP, 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 project 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 qualify as historical resources or unique archaeological resources for the purposes of CEQA. If impacted resources qualify as historical or unique archaeological resources, 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 licensed by the Energy Commission are reviewed to ensure compliance with all applicable local, state, regional, and federal laws, ordinances, regulations, standards, [plans, land use plans, leases, and permits] (LORS) (Pub. Resources Code, §§25523[d][1], 25525; 20, Cal. Code Regs., §§1704[b][2][Appendix B][i][1][A], 1744[a]). To be considered in the Energy Commission's licensing decision, LORS must pertain to the proposed project facilities. For the present analysis the applicable LORS consist of state laws and a local register of historic resources. See **Cultural Resources Table 1** for a summary of the LORS applicable to the proposed project.

[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.

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

Applicable LORS	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	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 prohibits the disturbance or removal of 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.
Civil Code, §1798.24	Provides for non-disclosure of confidential information that may otherwise lead to harm of the human subject divulging confidential information
Government Code, §6250.10—California Public Records Act	Provides for non-disclosure of records that relate to archaeological site information and reports maintained by, or in the possession of, the Department of Parks and Recreation, the State Historical Resources Commission, the State Lands Commission, the NAHC, another state agency, or a local agency, including the records that the agency obtains through a consultation process between a California Native American tribe and a state or local agency.
City of Huntington Beach1996 General Plan (HB 1996), Community Development Chapter, Historic and Cultural Resources Element, Table HCR-2.	The Historic Resources Board (HRB) for the City of Huntington Beach has generated a list of local landmarks considered to be of significant importance to the local community as shown on Tables HCR-1 and HCR-2. HRB is an advisory board to the City Council on historical issues and programs.

SETTING

Information provided regarding the setting of the proposed project places it in its geographical and geological contexts and specifies the technical description of the project. 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 HBEP has project elements that would be located in Orange and Los Angeles counties. The proposed project site and construction parking areas would be located in western Orange County, while the proposed offsite construction laydown area would be situated in Los Angeles County. (AES 2012a:Figure 1.1-2.) As discussed in the HBEP Application for Certification (AFC), both areas are located in the Los Angeles Plain or Basin (AES 2012a:5.2-3; Schoenherr 1992:10). 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 comprises 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]. Near the coast, eolian (wind-blown) sediments and sand dunes sit atop the alluvial sediments. (AES 2012a:5.4-2.)

PROJECT, SITE, AND VICINITY DESCRIPTION

The proposed project site and off-site parking areas are located in the urban, beachside City of Huntington Beach. The project site is surrounded on the north and east by industrial and commercial properties, the southeast by a wetland conservation area, the south by the Pacific Coast Highway (PCH) and Huntington Beach, and the west by residential and commercial properties. The off-site construction laydown area is situated in the port area of the city of Long Beach, on artificial fill.

The project vicinity lay in a bolsa, or swampland and tidal flats, from at least the nineteenth century through the early part of the twentieth. The post-World War II building boom and recreational opportunities afforded by the ocean resulted in mid-century development of the area, preceded by industrial uses (oil derricks, sewage disposal, airport, and power generation).

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 project 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 approximately 14 feet above sea level (asl) on the Orange County coastline in the city of Huntington Beach. The proposed offsite construction parking areas would be located in an effectively identical setting, albeit closer to sea level. Current land uses in the project vicinity include residential and commercial development, industrial, wetland preserves, parklands and open space, landfill, and beaches. (AES 2012a:5.2-2.)

The proposed offsite construction laydown area would be located in the city of Long Beach, Los Angeles County, adjacent to the Alamitos Generating Station. This location rests between 10 and 15 feet asl. Current land uses consist of industrial, commercial, residential, and parkland endeavors. (AES 2012a:5.2-2, 5.2-3.)

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[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.

The modern climate of the project vicinity is influenced by the adjacent open coastline and its presence in a semi-permanent high-pressure zone. Consequently, the local weather conditions are typically mild, with average daily highs of 63–84 degrees Fahrenheit (° F) and average daily lows of 45–63 ° F. Summers are dry and warm, punctuated by very hot weather, often caused by southeasterly Santa Ana winds. Winters are mild and wet, most precipitation falling between November and April, averaging about 14 inches annually. (AES 2012a:5.1-3; Engstrom 2006:847.)

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 the 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 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. 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 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 7500 B.P., sea surface temperature (SST) is inferred to have been warmer and wetter than today, 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. 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, chenopods, and the sunflower family [Compositae][6]) throughout this interval. Despite the warm and dry conditions of the Middle Holocene, locally sufficient stream flows were available to freshwater marshes, such as Newport Bay. In such instances, indicator species of wetter conditions, such as members of the

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

sunflower family were abundant, despite an overall arid trend. (de Barros et al. 2002:16; 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 direct reach into near-shore wetlands, changing water bodies like Newport Bay from freshwater to largely saltwater features. Wetland salinity was moderated during pulses of freshwater inputs, especially during the flood-prone 3800–2800-B.P. interval (de Barros et al. 2002:16.)

SST oscillated between warm and cold temperatures on a millennial timescale during the last 11,000 years. Cooling episodes occurred about every 1,500 years. Over the last 3,000 years, SST followed a tri-phase development:

1. 3000–1500 B.P.: SST was warm and relatively stable. Marine productivity was low.

2. 1500–650 B.P.: SST was very cold and unstable. Precipitation was low. Marked dry periods occurred at 1450–1150 and 970–700 B.P., corresponding with Stine's (1998) Medieval Climatic Anomaly or medieval drought periods. Between 1000 and 650 B.P., marine productivity was very high.

3. 650 B.P.–present: SST became warmer and more stable. The period of highest marine productivity in the Late Holocene occurred about 650–400 B.P., followed by low marine productivity. A severe dry interval occurred about 300–200 B.P., coincident with much of the Little Ice Age. (Kennett and Kennett 2000:383–385; Vellanoweth and Grenda 2002:79–80; West et al. 2007:25–26.)

Pollen evidence from two cores in San Joaquin Marsh, Upper Newport Bay, show 40–70 percent drought- and salt-tolerant plant pollen from 4500 to 500 B.P., suggesting an overall terrestrial drying trend throughout the Late Holocene (Vellanoweth and Grenda 2002:78).

Estimates from modern stream flow data in the Santa Ana River (calibrated against a tree-ring chronology) to stream flow for 430–55 B.P. show that major floods occurred on average every 84 years, though the data follow a chaotic, non-linear pattern (Vellanoweth and Grenda 2002:80–81.)

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 events in a 20-year period. (Engstrom 2006:850–851.)

Geology and Soils

The geology and soils of the project vicinity are described in three sections of the AFC and a geotechnical study conducted in support of the AFC (AES 2012a:5.4-2–5.4-3, 5.8-2–5.8-4, 5.11-2–5.11-3; Ninyo & Moore 2011:6). These discussions are not reproduced in full here, but are summarized for the reader's convenience, followed by a discussion of geologic and soil characteristics relevant to this FSA's cultural resources analysis.

The proposed project site, on-site construction parking area, and off-site construction parking areas are situated on Quaternary[7] eolian (wind-deposited) sediments, according to the 30°-by-60° Santa Ana geologic map examined by the applicant. The same map indicates that the proposed off-site construction laydown area in Long Beach overlies artificial fill. (AES 2012a: Figure 5.4-1.) The AFC presents evidence that all sediments excavated to build the proposed project are Holocene in age (AES 2012a:5.8-3). Staff's review of radiocarbon-dated stratigraphy immediately north of the proposed project site supports and adds more chronological detail to the AFC's analysis of sediment age (see *Geomorphology* below).

The AFC indicates that the proposed project site, on-site construction parking area, and two of the off-site construction parking areas would be placed on Tidal Flat soils (soil map unit 211). The easternmost off-site construction parking area would be sited on Bolsa silt loam (soil map unit 122), while the westernmost off-site construction parking area would be on a Beaches soil map unit (115). The proposed off-site construction laydown area would be located in an Urban Land-Sorrento-Hanford (soil map unit s1026) soil unit. (AES 2012a:Figure 5.11-1.) These soil series are suggestive of the qualities of past and recent environs in the project vicinity. Briefly, tidal flats are subject—under natural conditions—to regular cycles of inundation and exposure, while beaches combine tidal influence with that of direct wave-action and winds. Bolsa silt loam soils were formed by alluvial deposition, such as the Santa Ana River's meanderings and flooding. Finally, Urban Land-Sorrento-Hanford soil units are prevalent in areas of considerable urban development, often involving the placement of large amounts of artificial fill. (AES 2012a:5.11-2–5.11-3.)

Geomorphology

The discussion of the geomorphology of the proposed project area considers how and when the underlying soils and sediments developed, and provides a baseline physical context to assess whether surface and buried archaeological materials are likely to occur in the proposed project area.

[7] 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. 2012). Without further description, therefore, Quaternary geologic formations may be taken to date anywhere from 2.588 million years ago to the present day.

The project vicinity, excluding the off-site construction laydown area, 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 barrier spits, beaches, low hillock dunes (foredunes), estuaries, and salt marsh (Engstrom 2006:852).

The project vicinity is situated on the portion of coastline known as the San Pedro Littoral Cell[8], which consists of a several geomorphic features: low, sandy shoreline; barrier island; barrier spits and inlets; beach backed by low cliffs; a long barrier spit near Newport Bay; mesas standing 24–120 feet above the surrounding landforms; sand beaches and shallow lagoons close to the ocean (de Barros et al. 2002:6; Engstrom 2006:851). A summary of regional geomorphology from the terminal Pleistocene through the Holocene (ca. 20,000 B.P.–present) is presented below.

20,000–12,000 B.P.

During this time, sea level was markedly lower than today, presenting a wider shoreline than is currently seen in southern California. The coast was rocky, backed by 100–150-foot-tall sea cliffs. Stream action cut valleys onto the coastal plain, with sediment discharge lost to the ocean. The shoreline was energetic at this time owing to the action of large waves. Kelp forests developed near the break of the continental shelf. (Masters and Aiello 2007:40.)

14,000–11,000 B.P.

Sea level rise increased wave energy across the continental shelf and flooded the incised valleys that formed over the previous 6,000 years. Estuaries expanded during the melt water pulses of 13,500 and 11,000 B.P., when stream flows increased considerably. Stream sediments, however, were deposited into the head of estuaries and did not reach the shore, which remained rocky. Kelp forests grew in extent and sea level sat approximately 180 feet below the present level. (Masters and Aiello 2007:40.)

10,000–8200 B.P.

This interval witnessed the development of quiet-water estuaries that fostered fish nurseries, shellfish beds, shorebird foraging, and marine mammal visitation. Deposition of sediment onto the shoreline was limited at this time. Hence, the coast remained rocky with cobble beaches and supported shallow reefs and large fish communities. At this juncture the ocean had transgressed to a point about 115 feet below modern sea level. (Masters and Aiello 2007:40.)

[8] Littoral cells are natural compartments along coasts that contain a complete cycle of sedimentation: sources of sediment (e.g., eroding mountains), transport paths (such as streams), and sinks (places where much of the sediment accumulates and is typically retained).

6000–5000 B.P.

Between 6000 and 5000 B.P., the southern California coast began its transition from a rocky shore coastline to a sandy beach condition, aided by shore platform-cutting wave action. Shoaling estuaries became less productive and were replaced by sand and mudflats. (Masters and Aiello 2007:40.)

4000 B.P.–Present

During the Late Holocene (the last 4,000 years), large estuaries were replaced by shallow wetlands and lagoons, which were periodically closed by the formation of sand spits. During the last 2,000 years, "megadroughts" (see Stine 1998:51) lasting up to 200 years probably closed lagoons to direct ocean influence. "Megafloods" with a return period of 200–400 years reopened lagoons to the ocean. Kelp forests limited to wave-cut platforms off rocky headlands. Shallow rocky reefs were smothered by sand on the inner shelf. Sand beaches accreted within the littoral cells, certainly during summers' low-wave energy. (Masters and Aiello 2007:40.)

Native Plants and Animals in the Project Vicinity

The AFC describes the current suite of plants and animals of the project vicinity, with an emphasis on special-status species and sensitive ecological communities (AES 2012a: Section 5.2). Marshes in the project vicinity are sometimes described in terms of three distinct zones: low, middle, and high elevation. Staff's description of local flora and fauna incorporates and draws from Section 5.2 of the AFC, but also expands the discussion to include non-special-status species important in human ecology[9]. Prior to urban development of Huntington Beach, natural habitats in the project vicinity (including the proposed offsite construction laydown area) included open beach, southern coastal salt marsh, southern foredunes, southern dune scrub, open water, salt panne, and mud flats (AES 2012a:5.2-3, 5.2-14). Further removed from the proposed project were the grasslands of the Los Angeles Basin, riparian woodland along streams, and woodlands in the foothills (AES 2012a:5.2-2, 5.2-3).

Local Plant Communities

Southern coastal salt marsh occurs in areas subject to regular tidal flooding, such as sheltered inland bays, estuaries, and lagoons. Lowest marsh elevations situated adjacent to open water and prolonged saltwater tidal inundation are typified by cordgrass (*Spartina folosia*). Middle-elevation portions of coastal salt marshes generally contain pickleweed (*Salicornia virginica*) and are usually subject to cyclical high-tide flooding. The upper marsh zone is only flooded for short periods during very high tides. This upper zone supports pickleweed (*Salicornia virginica*), saltgrass (*Distichlis spicata*), alkali heath (*Frankenia salina*), alkali weed (*Cressa truxilensis*), California seablite (*Suaeda californica*), and marsh jaumea (*Jaumea carinosa*). The distribution of coastal salt marsh today is considerably reduced from pre-urbanized conditions along the coast. (AES 2012a:5.2-14; Ornduff 1974:78–20.)

[9] Scientific names for species discussed here are drawn from: AES 2012a:Section 5.2, Johnson and Snook 1967, Lightfoot and Parrish 2009; Moratto 1984:Appendix 1; Ornduff 1974; Schoenherr 1992. Where all scientific names are presented unambiguously in the AFC, they are not reproduced in this FSA section; the reader is instead referred to AES 2012a:Section 5.2.

Southern foredunes are similar to active sand dunes save for the following characteristics: they are less subject to wind, have more stable sand, and greater groundwater accessibility, all of which promotes vegetation growth that further stabilizes the dunes. Native plants associated with foredune communities include beach morning glory, silver bur ragweed, and common eucrypta. The distribution of southern foredunes has been reduced in size since the onset of urban development along the coast. (AES 2012a:5.2-14.)

Southern dune scrub is a dense community of scattered scrub, shrubs, subshrubs, and herbaceous plants less than 3 feet tall. Common native plants include beach saltbush, California croton, California ephedra, mock heather, dune lupine, desert thorn, prickly pear (*Opuntia* spp.), lemonade berry (*Rhus integrifolia*), and jojoba. (AES 2012a:5.2-14; Lightfoot and Parrish 2009:267.)

Southern cottonwood willow riparian forest contains broadleaf winter-deciduous trees such as cottonwoods; black, sand bar, Pacific, and arroyo willows; sycamore; mugwort; and coyotebrush. A known, current occurrence of this community is along the Santa Ana River. (AES 2012a:5.2-14.)

Southern coast live oak riparian forests are locally dense evergreen woodlands. The dominant overstory species is coast live oak. Associated species include bay laurel, big leaf maple, mugwort, toyon, wild rose, and poison oak. (AES 2012a:5.2-19.)

Local Fauna

Coastal sand dunes and foredunes provided habitat for numerous animals: San Francisco tree lupine moth (Grapholita edwardsiana), Morro blue butterfly (Icaricia icarioides moroensis), Pheres blue butterfly (Aricia icarioides pheres), deer mouse (Peromyscus maniculatis), California vole (Microtus californicus), black legless lizard (Anniella pulchra nigra), northern harrier (Circus cyaneus), gray fox (Urocyon cinereoargenteus), and striped skunk (Mephitis mephitis) (CCC 1987:19).

Salt marshes provide habitat for numerous animals, notably several species of waterfowl, such as light-footed clapper rail, Belding's savannah sparrow, California black rail (Laterallus jamaicensis), western snowy plover, California least tern, California brown pelican, salt marsh skipper, mallard (Anas platyrhynchos), and godwit (Limosa sp.). Additional waterfowl and shorebirds forage and inhabit salt marshes in spring and fall: brants (Branta spp.), pintails (Anas spp.), canvasback (Aythya valisineria), sandpipers (Scolopacidae Family), curlew (Numenius americanus), and willet (Catoptrophorus semipalmatus). (AES 2012a:5.2-3, 5.2-4; CCC 1987:23–24.)

Fish, shellfish, and other aquatic animals of salt marshes and mudflats include California killifish (Fundulus parvipinnis), bay goby (Lepidogobius lepidus), striped bass (Morone saxatilis), topsmelt (Atherinops affinis), starry flounder (Platichthys stellatus), moon snails (Polinices spp.), horn snail or horn shell (Cerithidea californica), fiddler crabs (Uca crenulata), ghost shrimp (Callianassidae Family), fat innkeeper (Urechis caupo), pea crabs (Pinnotheres pisum), scale worms (Lepidonotus melanogrammus), gobies (Gobiidae Family) and various other crabs, shrimp, clams, and worms. Salt marshes are also important to some mammals, such as California salt marsh shrew

(Sorex ornatus salicornicus), harvest mouse (Reithrodontomys megalotis catalinae), and harbor seal (Phoca vitulina). (CCC 1987:24.)

Other wetland animals are expectable in the pre-development environs of the project vicinity: San Diego horned lizard, western pond turtle, silvery legless lizard, Swainson’s hawk, white-tailed kite, and tri-colored blackbird (AES 2012a:5.2-3, 5.2-4, 5.2-13).

Locally available shellfish species include abalone (Haliotis spp.), bean clam (Donax gouldii), black turban snail (Chlorostoma funebralis), California mussel (Mytilus californianus), littleneck clam or rock cockle (Leukoma staminea), olive snail (Callianax biplicata, formerly Olivella spp.), Pismo clam (Tivela stultorum), thick scallop (Argopecten ventricosus), and Venus clams or hardshell cockles (Chione spp.) (Lightfoot and Parrish 2009:271–272).

Pelagic or open-ocean fish in the project vicinity include anchovies (Engraulididae Family), chub mackerel (Scomber japonicas), Pacific bonito (Sarda chiliensis), leopard shark (Triakis semifasciata), Pacific angel shark (Squatina californica), Pacific barracuda (Sphyraena argentea), Pacific sardine (Sardinops sagax), shovelnose guitarfish (Rhinobatos productus), soupfin shark (Galeorhinus galeus), and yellowtail (Seriola lalandi). Near-shore fish in the area comprise cabezon (Scorpaenichthys marmoratus), California sheephead (Semicossyphus pulcher), surfperches (Embiotocidae Family), rockfishes (Sebastes spp.), kelp bass (Paralabrax clathratus), señorita (Oxyjulis californica), blacksmith (Chromis punctipinnis), bat ray (Myliobatis californica), and soupfin shark (G. galeus). (Lightfoot and Parrish 2009:273.)

Prior to development of the project vicinity, the area supported various mammals. Among marine mammals there were sea lions (Otariidae Family), sea otter (*Enhydra lutris*), and northern elephant seal (*Mirounga angustirostris*). In addition to the terrestrial mammals listed previously in this section, likely inhabitants of the project vicinity included ground squirrels (*Spermophilus* spp.), hares and rabbits (Leporidae Family), mule deer (*Odocoileus hemionus*), and woodrats (*Neotoma* spp.). (Lightfoot and Parrish 2009:275–277.)

Prehistoric Setting

The HBEP AFC summarizes the human prehistory of the project vicinity with an emphasis on regional trends. In the AFC’s summary, the prehistoric setting relies on a recent synthesis of regional prehistory (Byrd and Raab 2007) and is essentially discussed in four parts: ancient sites (commonly referred to in the archaeological literature as Paleoindian and Paleo-Coastal traditions), Early Holocene (11,500–7550 B.P.), Middle Holocene (7950–1450 B.P.), and Late Holocene (1450 B.P.–present). (AES 2012a:5.3-3–5.3-5.) Staff finds much of the AFC’s prehistoric setting to be correct and will not repeat it at length here. However, staff provides supplementary information in this section in order to analyze the HBEP’s potential to affect archaeological resources. Staff provides additional information in the following areas: (1) clarification of the regional chronology and culture history and (2) the character of local archaeological resources.

Regarding chronology, some archaeologists discuss trends in prehistory against either an arbitrary framework or a timescale that is meaningful in other disciplines, such as geology. For example, Byrd and Raab (2007:217) discuss southern coastal archaeology against a geological timeframe: Early Holocene (ca. 11,700–7700 B.P.), Middle Holocene (ca. 7700–3600 B.P.), and Late Holocene (ca. 3600 B.P.–present). The AFC follows suit for defining the archaeology of the Early Holocene, but its discussion of Middle and Late Holocene time follows the chronology of local archaeological cultures or patterns instead and inadvertently masks regional variation among them (see AES 2012a:5.3-3–5.3-5). Human use of the project vicinity changed over time, making knowledge of specific archaeological patterns in the area necessary to estimate the likelihood that archaeological resources are located in the proposed project area.

Archaeologists traditionally view the Early Holocene archaeology of coastal southern California as the product of peoples who focused on extracting resources from the terrestrial environment. These Paleoindians were viewed as originally dwelling in the southern California deserts and using lake and lakeside resources—an economic orientation referred to as the Western Pluvial Lakes Tradition (WPLT)—until Pleistocene-age lakes in the deserts and Great Basin dried at the beginning of the Early Holocene, at which time some WPLT peoples migrated west to the coast and adjusted their food-getting strategies. (Byrd and Raab 2007:217.) The presence of archaeological sites on the Channel Islands[10] at the beginning of the Holocene Epoch, however, suggests that the southern California coast was not simply colonized by WPLT peoples, but by another group instead or possibly by two distinct groups of people. The Early Holocene marine economy (fish and shellfish), described in the AFC (AES 2012a:5.3-4), has long been equated with the San Dieguito Complex because of assumed links with the WPLT and similarities in flaked stone tools (Moratto 1984:Figure 4; Wallace 1955:218). The marine focus, however, clearly represents a distinct lifeway, and early coastal sites—situated on bays and estuaries—are now commonly classified as part of the Paleo-Coastal Tradition (ca. 12,000–8000 B.P.) (Byrd and Raab 2007:218; de Barros et al. 2002:Figure 2-5).

WPLT archaeological sites consist of leaf-shaped, Lake Mojave, and Silver Lake projectile points; stone crescents; formal and expediently made flake tools; atlatl (spear-thrower) hooks; and micro-cores[11]. Tools for plant processing are notably absent. Presumably, these assemblages represent an economy focused on game hunting. (de Barros et al. 2002:29, 31.) Paleo-Coastal Tradition sites exhibit a similar flaked stone tool assemblage, but differ from the WPLT sites in that the former have yielded pitted stones, asphaltum, pointed-bone objects, and shell spoons and ornaments (Moratto 1984:104, 109). Marine shellfish, fish, and mammals also are dominant at mainland coastal sites (approximately 73 percent of animal remains) compared to pericoastal and other inland sites (25 percent) (Erlandson et al. 2007:61).

[10] The most reliable earliest dates on Early Holocene archaeological sites in the southern Bight come from San Miguel Island and San Clemente Island (Byrd and Raab 2007:219) and from CA-ORA-64 on the mainland (Erlandson et al. 2007:Table 4.1). The AFC mentions as examples of Early Holocene archaeological sites: the “Los Angeles Man” of Baldwin Hills and human remains and artifacts from La Brea Tar Pits (CA-LAN-159) (AES 2012a:5.3-3, 5.3-4). Bada (1985), Taylor et al. (1985), and Erlandson et al. (2007:54) have discredited the dating of these finds.

[11] Cores are masses of stone from which pieces are detached to make tools.

Late in the Early Holocene (about 8000 B.P.), the Orange County archaeological record presents a new culture and adaptive pattern known as the Millingstone Horizon, which persisted in some nearby mountain areas until 1500–1000 B.P. (de Barros et al. 2002:31). 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). Although commonly seen as a strictly Middle Holocene archaeological horizon, the Millingstone Horizon spanned much of Orange County prehistory, from the end of the Early Holocene to the Late Holocene, as exemplified by the Cogged Stone Site, CA-ORA-83 (de Barros et al. 2002:42–46). Along the Newport Coast, Millingstone Horizon settlement patterns seem to consist of summer residential bases on marine terraces and other seasonal residential bases around Newport Bay and the foothills of the Santa Ana Mountains. From the marine terraces, Millingstone people fished for sheephead and gathered mussels. Other seasons saw a mix of marine and terrestrial resource use. The Millingstone Horizon component of the Cogged Stone Site is unusual in that it displays a ritual or ceremonial focus. (de Barros et al. 2002:32, 46.) Perhaps following the shell bead trade routes described in the AFC (AES 2012a:5.3-4), most obsidian was obtained from the Coso Volcanic Field (Inyo County), occasionally from the more remote Casa Diablo (Mono County) source (de Barros et al. 2002:36–37). Typical Millingstone Horizon artifacts are described in the AFC's treatment of the Middle Holocene (AES 2012a:5.3-4).

A second type of archaeological culture or complex is known from Middle Holocene Orange County. Known as the Intermediate Cultures (ca. 3000–1350 B.P.), site assemblages are typified by mortars and pestles, basket-hopper mortars, fewer handstones and millingstones, the introduction of the bow and arrow and phasing out of larger dart points, circular fish hooks, and the appearance of stone, bone, and shell beads. Shell beads include two time-sensitive olive snail types and beads made from limpets (*Megathura cremulata*). During major draw-downs of Lake Cahuilla (Salton Sea), Intermediate Culture peoples obtained obsidian from the Obsidian Butte source, although the majority was procured from the Coso Volcanic Field. (de Barros et al. 2002:33–34, 36–37.)

Intermediate Culture sites were fewer in the Newport Bay area than Millingstone Horizon sites, but concentrated in residential bases near permanent water sources within about 2 miles of the bay, such as bluffs above permanent springs and near streams and springs. Some Intermediate Culture sites appear to be reoccupations of earlier field camps and minor residential sites. Fish and shellfish were brought to residential bases from the ocean and from the bay. The Newport Coast and San Joaquin Hills appear not to have been occupied at this time, hypothetically due to reduced resources under very dry conditions. (de Barros et al. 2002:35.)

The AFC's description of Late Prehistoric (ca. 1200 B.P.–Spanish contact), termed therein "Late Holocene", accurately describes the major archaeological trends of this period: abandonment of larger projectile points in favor of smaller points suited to the bow and arrow, concentration of populations into larger villages, proliferation of satellite temporary camps and single-task sites, and the development of what became the Gabrielino society known from the historic period. (AES 2012a:5.3-5.)

Ethnographic Setting

Gabrielino Tongva

The Gabrielino people and representative tribes are most directly affiliated with 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 of the Takic language family) speaking group. Kroeber has suggested the existence of six linguistic subgroups based upon language dialect differences. (Bean and Smith 1978:538.) The Gabrielino language has recently been identified as a stand-alone Takic language distinct from Cupan (Mithun 1999:539, 543–544).

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 appears as though the Los Angeles Basin Gabrielino referred to themselves as *Kumi vit* and the San Fernando Valley indigenous 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 who occupied at least 50, if not 100 villages.

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 Gabrielino left their traditional villages, whether willfully or under forced duress, and settled near the missions. 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; although 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. Loosely translated as "people of the earth"[12], 'Tongva' has gained popularity since the 1990s and is often used in conjunction with the word 'Gabrielino', although staff research suggests that at least one Gabrielino group rejects the use of the word 'Tongva' as a group identifier.

[12] McCawley (1996) 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 indigenous of the Islands and particularly San Nicholas 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, demonstrating that the linguistic differences mentioned in the first paragraph of this ethnographic setting were in some cases considerable. (Hardacre 1971:272–284.) Kroeber corroborates the “Lone Woman of San Nicholas” story (Kroeber 1976:633–635).

Today, the names Gabrielino, Tongva, or Gabrielino Tongva seems to be the most preferred reference of all sub-groups. The name Gabrielino Tongva will be used for the purposes of this report 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 being prehistorically the group with perhaps the greatest wealth and population, and controlled one of the richest territories in all of 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.)

The territorial boundaries, while imprecise, are defined here in a counterclockwise direction starting in the southwestern area of the territory at the mouth of Aliso Creek.[13] The boundary follows the Aliso Creek up into the Santa Ana Mountains and 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 Rift and the Santa Ana River intersect. The boundary follows the rift in a northwest direction. The territory includes most if not all of the San Gabriel Mountains. The boundary curves back towards the ocean, following generally the area defined by Soledad Canyon. The territory includes all of the San Fernando Valley, includes the eastern slopes of the Simi Hills and then crosses the Santa Monica Mountains where the boundary line comes down to the coastline at approximately where the present town of Malibu is located. The territory includes the three ocean islands of San Nicolas, San Clemente and Santa Catalina, and the ocean waters surrounding the islands and between the islands and the mainland. The territory includes the Verdugo Mountains of which the central and highest peak was named Tongva Peak in 2006 (Chambers 2001:1-2).

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

The HBEP is located in the southwestern portion of the Gabrielino's mainland territory near and slightly north of where the Santa Ana River empties into the Pacific Ocean. However, the coastal geology in this area is such that both the coastline and the mouth of the river have meandered over an extensive stretch of coastline. This has created an area that, prior to urban infill, was salt marsh and estuary. Kroeber provides a map of ethnographic village locations of Southwestern California that indicates that two villages were located near the Lower Santa Ana River. To the south of Newport Bay is the ethnographic village of *Mayo*, and to the north of Newport Bay is the ethnographic village site of *Lucup.* (Kroeber 1976:Plate 57.) A "Tongva Village" map, featured on two Gabrielino Tongva tribal websites indicates that the two villages mentioned above were named *Lopuukngа* and *Moyonga* (Tongva Tribe n.d.a). In addition, the tribal village map provides general locations of two village locations along the coastline in the vicinity of the HBEP. One village is perhaps located near where the breached Santa Ana River currently enters the Pacific Ocean and has the name *Kenyaanga*. The second is located closer to the project area, but because of the scale of the map the village name and precise location cannot be deciphered. It is likely that the primary ethnographic villages were located on the higher mesa areas above the bay and related estuary and marsh lands, and that "villages" located along the beaches, were frequented as marine resource procurement camps. However the coastline has varied due to shifting ocean depths and related sand deposits and this coastal area of California is known for containing off-shore buried/submerged archaeological deposits.

Gabrielino Tongva Affiliations and Relations with Other Indigenous Groups

The Gabrielino Tongva maintained solid trade relations with all groups that surrounded them: The Chumash, the Tatviam, Serranno, Cahuilla, Luiseno and Juaneno. Through these intermediaries the Gabrielino 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. Steatite, some of the best found in all of California, was traded from the Gabrielino Tongva source at the Santa Catalina Island, out to the east as far 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 some suggestion that local Gabrielino 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 Coco-Maricopa Trail (also referred to as the Halchidoma trail) guided people and goods between the Southern California Coast and Central Arizona (Johnston 1980). The regional indigenous trail network was of keen interest for the missionaries, intent on finding overland routes that allowed for transportation linkages to the established missions of New Mexico (Kessel 2002:253–287).

The literature suggests that the Gabrielino were the center of the Jimson weed/datura/toloache cult and that the neighboring Luiseno, Juaneno and Chumash fashioned their similar ceremonies following the Gabrielino Tongva lead (Kroeber 1976:626–627).

It is suggested that the southern mainland territory of the Gabrielino, between the Santa Ana River and the Aliso Creek, and including the Newport Beach area, was occupied in recent precontact and early mission times (1650–1775) by both Gabrielino Tongva and Juaneno (Earle and O'Neil1994:153–154). The two closely affiliated groups intermarried within this overlapping territorial strip of land. This analysis ensues from a careful reading of mission records where names of married neophytes were entered into mission records and noticing word length of names and name suffixes that reflect the related but different linguistics naming suffixes of the two neighboring peoples (Earle and O'Neil 1994:153–154).

Sources of Ethnographic Data

The earliest ethnographic accounts, other than missionary records, 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 Gabrielino section 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 Smithsonian 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 Claudia Jurmain that is, in part, 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 a related diversity of 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 coastline 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 that extended south of San Pedro to Newport Bay consisted of a string of secondary subsistence gathering camps. Primary subsistence villages are found immediately adjacent and inland from the coast. (Bean and Smith 1978:539.)

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 for use 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 1978:540.)

Steatite was traded inland in raw and fashioned form, and was used to manufacture animal effigies, pipes, cooking utensils, arrow straighteners, and palettes (a type of armor plate). Asphaltum was used to assure water tight vessels including baskets and canoes, and was used to attach rare minerals, shells and beds to ceremonial dress. Bedrock and portable mortars predominated. The Gabrielino were uniquely known for specific ownership and transportation of personal mortars. Other utensils of common use were metates, mullers (pestles), mealing brushes, wooden stirrers, shell spoons, and wooden bowls. Deer scapulae 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 and throwing clubs and slings. Planked 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 Luiseno to the south. Marsh and estuary bodies of water were traveled by use of rush rafts. (Bean and Smith 1978:542.)

Houses were domed, circular structures thatched 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. Sweathouses were small semi-circular, earth covered buildings reserved exclusively for adult male use. Menstrual huts were also constructed and frequented by women. Ceremonial open-aired enclosures 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 and, among other ritual functions, housed ceremonial sand paintings featuring depictions of the sun and moon and were utilized for divination events. (Bean and Smith 1978:542.)

Gabrielino Tongva Political Organizations and Religious Practices

Because of the missionary conversion process, coupled with a high rate of disease for 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.

The Gabrielino seemed to have adhered to a moiety kinship structure likely of the "Dakota" system with Iroquois cousin terminology, similar to their neighboring Juaneno and Luiseno neighbors. In addition, 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 of everyone else: the poor, disreputable, or those of ill fate. Marriage or wealth accumulation were the prime avenues for social movement within the class system (Bean and Smith 1974:543, 545).

Villages comprised non-localized segmentary lineages. One or two lineages may 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 chief name. Leadership tended to be passed through male descent, unless the other village lineage leads could agree that either there was no one in the controlling lineage that existed, 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 1974:544).

Shamans gained their power and knowledge directly from the “Great Spirit” when conversing with the spirits while in Jimson Weed induced 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 (Bean and Smith 1974:544).

Gabrielino religious beliefs and practices are not well understood or documented but it appears that the Gabrielino, and perhaps the Gabrielino of Santa Catalina Island specifically, developed the Toloache cult which involved ritual consumption of Jimson Weed. This cult spread to distant tribal nations throughout Southern California and the southern Central Valley. The Jimson weed cult was most 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 (Kroeber 1976:626).

Contemporary Tribal Entities with Ethnographic Affiliations

There are various Gabrielino Tongva and Juaneno tribes, nations and other organizations. Names are very similar and it is difficult at first glance to determine the groups, political platforms and cultural affiliations. Addressing the multiple Gabrielino Tongva identity and related organizations, Wikipedia (2013) summarizes as follows.

> *Since 2006, there have been four organizations claiming to represent the Tongva: The Gabrielino-Tongva Tribe – also known as the “hyphen” group from the hyphen in their name, the Gabrielino/Tongva Tribe of the Los Angeles basin—also known as the “slash” group—The Gabrieleno Band of Mission Indians, and the Gabrieleno/Tongva Tribal Council of San Gabriel. Two of the groups are the result of a hostile split over the question of building an Indian Casino.*

However, the Native American Heritage Commission (NAHC) list provides additional tribal names that represent Gabrielino or Tongva people and culture. Tribal entities are listed below.

Gabrielino Band of Mission Indians – Kizh (Kitc) Nation

The Gabrielino Band of Mission Indians – Kizh (Kitc) Nation 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 seven-person tribal council seeks federal recognition and is an advocate for the protection of cultural resources. The Nation’s website provides a map of sites, including village locations; the project vicinity is identified as having two villages one on either side of the Santa Ana River. Lopuuknga is on the north side of the river and Moyonga is on the south side of the current day Newport Bay. Along the coast line and to the north of the Santa Ana River (the map depicts the Santa Ana River flowing into Newport Bay) is village location with the name Kenyaanga (Tongva Tribe n.d.a).

Gabrielino-Tongva Tribe

The Gabrielino-Tongva Tribe, historically part of the San Gabriel Band of Mission Indians, has offices in Los Angeles California. The tribe has sought 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. (Gabrielino-Tongva Tribe 2013). 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 (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.)

Juaneno Band of Mission Indians Acjachemen Nation

The tribe operates through a tribal council. The Nation has gained state legislative recognition but was recently (March 2011) denied federal recognition status. The Nation's website indicates that it has a membership of 1,941 people (Juaneño Band n.d.). A tribal representative advocated for tribal monitoring on the HBEP site.

United Coalition to Protect Panhe

The coalition was formed to respond to a project to build a toll road that the coalition felt would impact a Juaneno village named Panhe. The toll road project was proposed for an area approximately 40 miles south of HBEP. A representative of the coalition wrote to Energy Commission staff on June 2, 2013, expressing concern about the cultural sensitivity of the project area (see "Native American Consultation" subsection below).

No information was available pertaining to other known tribal entities, including the Gabrielino/Tongva, the 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 arrives in San Diego aboard the San Salvador and claims the land in the name of Spain (San Diego History Center 2012). In November 1602 Sebastian Vizcaino arrives in San Diego, he is surveying the coastline and gets as far 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* 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 serious attempts were made by the Spanish 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, but providing a stable supply route. Over 150 years would pass before the Spanish would attempt permanent settlement. The first overland expedition through Orange County was led by Don Gaspar de Portola in 1769 (OCHS 2013).

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 effort by establishing missions and converting the Indians. The first of the 21 missions to be built in California by the Spanish was San Diego Alcala. Local Native American tribes were the dominant source of labor at the missions. In 1771 Father Junipero Serra founded Mission San Gabriel Arcangel, in present-day San Gabriel (Los Angeles County) (OCHS 2013). Mission San Juan Capistrano, in present-day Oceanside (San Diego County) was founded on November 1, 1776 (OCHS 2013). Huntington Beach is located approximately 90 miles northwest of Mission San Diego Alcala between Mission San Gabriel Arcangel and Mission San Juan Capistrano. Missions San Gabriel Arcangel and San Juan Capistrano made up much of what is now Orange County.

Large tracts of land were granted by the Spanish government to encourage settlement in Alta California. In 1784 Jose Manuel Nieto received a Spanish land grant of 300,000 acres, Rancho Los Nietos, from the Spanish Governor of California, Pedro Fages (HB 1996). Rancho Nieto included all of the land between the San Gabriel and Santa Ana rivers and from the foothills to the sea (OCA 2013a).

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.

Rancho Los Nietos was divided by Governor Jose Figueroa in 1834 among Nietos heirs resulting in four separate ranchos: Rancho Las Bolsas, Rancho Las Alamitos, Rancho Los Coyotes, and Rancho San Gertrudes (Baily 1981; HB 1996; OCA 2013a). Rancho Las Bolsas covered 21 square miles and included portions of present day Huntington Beach, Garden Grove, and Westminster (Sherwood 2013).

War broke out between the United States and Mexico in May 1846. 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, near Sacramento, kick started the California Gold Rush. In 1850, California was granted statehood, and its first 27 counties were established. Huntington Beach is located in Orange County, which was established in 1889.

In 1850, Abel Stearns acquired both Las Bolsas and Bolsa Chica Ranchos on which he established a cattle ranching operation (HB 1996). Stearns was the largest land and cattle owner in the state at the time and he would later form Stearns Rancho Company under which name he raised cattle and horses and grew barley (HB 1996, 2013).

Stearns later sold off the portion of his land that would later be known as Shell Beach to Colonel Robert Northam. Colonel Robert Northam grew barley and sold it to the local ranchers. (HB 2013.)

In 1901, Philip A. Stanton and Colonel H.S. Finley organized the West Coast Land Company, purchasing 1500 acres of Rancho Las Bolsas from Northam and subdivided 40 acres along present day Main Street, 20 acres along each side of the street (HB 1996, 2013; Sherwood 2013). The new town was named "Pacific City," formerly Shell Beach. Some of the first buildings in the new town were moved from nearby Newport and Fairview via the beach at low tide (Baily1981). City improvements included streets and a water system and a post office was established in 1903 (Sherwood 2013). It was soon apparent that without connections to the surrounding communities that this new town would not grow. At this time there were no railroads, bridges or roads connecting the town.

Stanton brought in Henry E. Huntington in order to get the community connected via the "Red Cars" and the development company was reorganized and renamed the Huntington Beach Company (HB 1996). In 1904 the town was renamed Huntington Beach, street trees were planted, and the first pier was built. (Sherwood 2013).

The first electric passenger train, the "Red Cars" of the Pacific Electric Railway, arrived in Huntington Beach on July 4, 1904 (Milkovich 1986). Prior to this only freight lines had run through the city. In 1898 Pacific Electric Railway, named Los Angeles Consolidated Electric Railway at the time, was purchased by Collis Huntington, president of the Southern Pacific Railroad, and his nephew Henry Huntington (USC 2002). At this time the public transportation market in southern California was quite small with only scattered intercity rail lines. In 1902 the Huntingtons took over the Los Angeles-Pasadena interurban line and built a new line to Long Beach (USC 2002). In 1904 it reached Huntington Beach via the Newport-Balboa Line, which ran through Seal Beach (OCA 2013b). Between 1904 and 1910 three branches of the Pacific Electric Railway were built in Orange County (OCHS 2013). Ridership declined, due in large part to the increase in automobile ownership and freeways, starting in the 1950s and on April 8, 1961 operation of the Pacific Electric ceased (USC 2002).

The 3.57-square mile town of Huntington Beach with a population of 915 was incorporated on July 17, 1909 (HB 1996; Sherwood 2013).

The Huntington Beach Company provided several city improvements including electricity, telephone service, sidewalks, curbs and gutters, a pavilion, an indoor plunge, a hotel, and parks. Additionally, a nursery provided free plants to residents. Stanton sold his interest in the West Coast Land Company while Finley stayed on with the newly formed Huntington Beach Company. (Baily 1981.)

The Holly Sugar plant was built in 1911 and by 1914 more than 300 people worked at the plant making it the largest employer at the time (Sherwood 2013).

In 1919, encouraged by the discovery of natural gas by early settlers, Standard Oil leased 500 acres from the Huntington Beach Company and geologists began exploratory oil drilling (Baily 1981; HB 1996). Oil was being produced by August 1920 and in the early 1930s oil was discovered offshore at which time the technique of slant drilling began to be employed (Sherwood 2013). At the height of the oil boom the coastline was lined with derricks and Huntington Beach was California's fourth largest oil field (Baily 1981).

In the 1920s most of the Southern California beaches were segregated and only allowed white people. In December 1924 Hal R. Clark purchased 7.5 acres of beachfront about 1 mile below the Huntington Beach Pier for the purpose of developing a beach club for blacks (OCA 2013c). Clark worked with leaders of Los Angeles' black community to plan and promote the venture (OCA 2013c). Unfortunately over the next 2 years or so, a variety of circumstances and events including financial difficulty, community opposition, and arson, the club was never completed and in January 1927 the mortgage company foreclosed on the property (OCA 2013c).

The Pacific Coast Highway (a.k.a., PCH, Coast Highway, CA Highway 1), a portion of which is located near the project site, stretches from Baja to the Olympic Peninsula. The PCH was federally funded in 1919 and was completed in 1926 (OCHS 2013). It is also an Eligible State Scenic Highway.

Initially after WWII, Huntington Beach was excluded from the housing boom because the surrounding land was in active oil or agricultural production (HB 1996). In 1948, the state purchased 11,000 feet of beach property stretching from the trailer park west of the project site east to the Santa Ana River and established the Huntington Beach State Park (Sherwood 2013).

Agriculture dominated the economy of Orange County until the 1950s. While farms were being replaced with tract housing across Orange County, the effect was less extreme in Huntington Beach than other parts of Southern California (OCHS 2013). The last oil strike occurred in 1953 and as operations ceased the forest of derricks began to disappear from the coastline (HB 2013).

The Edison Company built an electrical generating plant in Huntington Beach that was completed in 1956 (Sherwood 2013). The rapid growth of the city that followed from 1957 to 1970 is attributed to annexations (HB 1996; Sherwood 2013). In the 1970s the city developed Central Park and established the Central Library (Sherwood 2013).

Steam Generation Plants in the United States

As stated in the AFC, the first commercial central electrical generation stations were located in New York and London and began operations in 1882 and steam-powered turbines continue to be the dominant technology used to generate electricity in the United States today.

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. (Myers 1983:11.) Edison is also known for improving the generation and distribution systems for electricity, which truly opened up the consumer market.

Southern California Edison Company

The Southern California Edison Company (SCEC) 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.) 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, business, and hotel that had subscribed to the service as well as street lighting downtown (Myers 1983:17). The third predecessor of the SCEC 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. Eventually Lloyd would incorporate his venture as the San Bernardino Electric Company. 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 1983:19–22.) Initially, power plants used direct current dynamos, which were limiting because the electricity could only travel a short distance, 2–3 miles, restricting the area that could be served. The introduction of alternating current dynamos extended this distance considerably as did San Antonio Light and Power engineer Almanrian William Decker's concept of the step-up, step-down transformation of electrical currents, which also allowed distribution over long distances (Myers 1983:26). 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 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. In1897, it merged with the West Side Lighting Company under the name the Edison Electric Company of Los Angeles (Myers 1983:37). The company grew as technology and the expanding customer base allowed. 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).

Orange County Flood Control District

The Orange County Flood Control District (OCFCD) was established in May 1927 under authorization of the Orange County Flood Control Act. Their purpose was to control flood and storm waters of streams flowing through and into the district (e.g., the Santa Ana River or San Juan Creek), mitigate the effects of tides and waves, and to protect the harbors, waterways, public highways and property in the district (OCPW 2013a. The Santa Ana River is approximately 1.4 miles away and the Huntington Beach Channel is adjacent to the project site. According to historic aerials and topographic maps the Huntington Beach Channel was constructed sometime between 1965 and 1972.

The Santa Ana River Mainstem Project was initiated in 1964 with the intent of upgrading the system from 10-year flood event protection to 100-year flood event protection (OCPW 2013b. The portion that is adjacent to the project site was begun in 2002 and completed in 2004. Formerly, it existed as a trapezoidal-earthen channel; it was replaced by an 80 feet wide, earthen bottom, vertical wall channel with 13–14 feet high steel sheet piles lining the sides. (OCPW 2013c)

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

METHOD AND THRESHOLD 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 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 [California Register of Historical Resources]", 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." (14 Cal. Code Regs., §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,[14] 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;
- Criterion 3, embodies the distinctive characteristics of a type, period, or method of construction, or represents the work of a master, or possesses high artistic values; or
- Criterion 4, has yielded, or may be likely to yield, information important to history or prehistory.

[14] 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.

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

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 (14 Cal. Code Regs., §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 may 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)(1), the 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."

Historical Resources Inventory

The development of the inventory of historical resources in and near the proposed project area is the requisite first step in the assessment of whether the project may cause a substantial adverse change (as defined at Pub. Resources Code §21084.1) in the significance of a historical resource, and may therefore have a significant effect on the environment. The effort to develop the inventory has involved conducting a sequence of investigatory phases that includes doing background research, consulting with local Native American communities, conducting primary field research, 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 archaeology 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 may have on cultural resources may be immediate, further removed in time, or cumulative. They may be physical, visual, noise-related, or scent-related in character. The geographic area that would encompass consideration of all such effects may or may not be one uninterrupted expanse. It may 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 (20 Cal. Code Regs., §1702[u]).

Staff defines the PAA as comprising (a) the proposed project site, (b) an architectural study area set approximately one parcel beyond the proposed project site, (c) the onsite construction parking area, (d) four off-site construction parking areas, and (e) the off-site construction laydown area at the Alamitos Generating Station in Long Beach, Los Angeles County (AES 2012a:Figure 5.3-1).

For ethnographic resources, the area of analysis is expanded to take 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 HBEP, staff identified no ethnographic resources and so defined no area of analysis for them.

No excavation is required or proposed within the architectural study area (outside the proposed project site), construction parking areas, or construction laydown area. Demolition and excavation are proposed within the project site, however, to variable depths. The depths of excavation are shown in **Cultural Resources Tables 2–4** and define the vertical limits of the PAA.

Cultural Resources Table 2
Depths of Major Excavations within the Proposed Project Site

Project Element	Area	Depth	Existing Grade (asl)	Foundation Top Elevation (asl)	Excavation Depth (asl)	Estimated Depth of Prior Earthwork (asl)	Natural Grade on Eastern Property Line (asl)
HBEP Block 1 Area							
CCGT/HRSG Foundation Slab	50 x 130	7	10	12.5	5.5	5.5 (existing conduit) 4 (East Fuel Oil Tank foundation) -10 (grounding anodes) 4 (Unit 5 Distillate Tank)	5
Two Generator Step Up Transformers adjacent to ACC	33 x 46	5	10	12	7	Same as area described above	5
ACC Pile Caps	N/A	3	9–15	12	9	Same as area described above	5
STG Foundation	60 x 55	7	6–15	11	4	Same as area described above	5
Two Generator Step Up Transformers west of Gas Compression Building	33 x 46	5	12	12	7	Unknown	5
Gas Compression Building Foundation	144 x 75	3	12	12.8	9.8	Unknown	5
HBEP Block 2 Area							
CCGT/HRSG Foundation Slab	50 x 130	7	14	16	9	9.5	8.5
Two westernmost Transformer Foundations	33 x 46	5	10	12	7	3.6	8.5
Two easternmost Transformer Foundations	33 x 46	5	10	12	7	Unknown	8.5
STG Foundation	60 x 55	7	12.5	12.5	5.5	Unknown	8.5
ACC Pile Caps	N/A	3	12	14.5	11.5	Unknown	8.5
Miscellaneous Excavations							
Relocated Gas Metering Station	82 x 108	3	10	9.5	-3.5	Not reported	Not reported
Ammonia Tank Spill Containment Basin	18 x 38	5	12	12	-5.0	Not reported	Not reported
Ammonia Tank Refilling Station	12 x 56	6	12	12	-6.0	Not reported	Not reported
Perimeter Grounding Cable	Adjacent to structures	2–3	Varies	Varies	Varies	Not reported	Not reported
Grounding Rods	0.75-inch Diameter	20	Varies	Varies	Varies	Not reported	Not reported

Notes: All dimensions are in feet. ACC = air-cooled condenser; asl = above sea level; CCGT = combined cycle gas turbine; HRSG = heat recovery steam generator; STG = steam turbine generator
Sources: AES 2012b:1–2; AES, with CH2M Hill 2012:41–48

Cultural Resources Table 3
Utility Trench Excavations

Utility	Length	Preliminary Depth to Bottom of Trench	Preliminary Trench Bottom Width
Storm Drain	4,150	7.58	5.00
Low Pressure Gas	1,209	7.25	5.00
High Pressure Gas	2,276	6.92	5.00
Potable Water	2,176	5.75	5.00
Fire Water	6,092	5.75	5.00
Process Water One	2,094	5.75	5.00
Process Water Two	2,637	5.75	5.00
Sanitary Sewer	1,200	8.00	5.00
60 x 30[a] Duct Bank	3,486	5.33	6.33
Notes: a = 60 feet by 30 feet; all other dimensions are in feet Source: AES, with CH2M Hill 2012:41–48			

Cultural Resources Table 4
Depths of Excavation: Electrical Structures

Project Element	Foundation Diameter	Foundation Depth	Existing Grade (asl)	Foundation Top Elevation (asl)	Excavation Depth (asl)	Estimate Depth of Previous Excavation (asl)
Single-circuit pole east of Gas Compression Building	6	18	12	12		Unknown
Single-circuit pole west of Gas Compression Building	6	18	13	12	Unknown	Unknown
Single-circuit pole north of Block 2 ACC	6	18	12.5	13	Unknown	Unknown
Single-circuit pole next to Intake Structure	6	18	12	12	-6	3.6
Single-circuit pole next to Pump Well	6	18	12	13	-5	-5
Notes: ACC = air cooled condenser; asl = above sea level; all dimensions are in feet Source: AES, with CH2M Hill 2012:41–48						

Background Research

The background research for the present analysis employs information that the applicant and Energy Commission staff gathered from literature and record searches, and information that staff obtained as a result of consultation with local Native American communities and the city of Huntington Beach. The purpose of the background information is to formulate the initial cultural resources inventory for the present analysis, to identify information gaps, and to inform the design and the interpretation of the field research that will serve to complete the inventory.

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 project area of analysis. The sources for the present search were the South Central Coastal Information Center (SCCIC) of the California Historical Resources Information System (CHRIS), online research, and documents filed in the Cultural Resources Unit and Compliance Office at the Energy Commission.

CHRIS Search

Methods

CH2M Hill, the cultural resources consultant to the applicant, requested records searches from the SCCIC for the proposed project on March 20 and July 30, 2012 (SCCIC # 11786.8528). The records searches covered the project site and a 1-mile radius surrounding it, as well as a 0.25-mile radius from the proposed parking areas (AES 2012b:5.3-1; Cardenas et al. 2012:3-1, Appendix 5.3C). The records search for the proposed off-site construction laydown area was included in the records search for a separate project application; this records search was conducted on August 31, 2011 for the proposed laydown area and a 1-mile radius surrounding it (SCCIC #s 11784.8527, 11786.8528) (AES 2012c:5.3-1). The records searches included examinations of the SCCIC's base maps of previous cultural resource studies and known cultural resources as well as:

- The NRHP
- The CRHR
- California Historical Landmarks listings
- California Points of Historical Interest listings
- Historic Property Data File (Noyes 2011:2; OHP 2011:204)
- Archeological Determinations of Eligibility (California OHP 2011:98; Noyes 2011:1)
- Historic maps (COE 1942, 1943; USGS 1896a, 1896b, 1945)

In addition, staff conducted an online search for proposed projects and environmental impact analyses using the websites of the city of Long Beach, city of Seal Beach, county of Los Angeles, and county of Orange. The purpose of this search was to identify cultural resource analyses that might not have been submitted to the SCCIC or were submitted after July 30, 2012.

Results

The records searches indicate that 36 previous cultural resource analyses have been conducted in the records search area; of these, twelve cultural resource studies have previously been conducted within or adjacent to the PAA (**Cultural Resources Tables 5** and **6**).

Cultural Resources Table 5
Literature Review Results within or adjacent to the PAA

Author and Date of Study	SCCIC Study Number	Resources Identified in PAA
Ahlering 1973	OR-00001	None
Atkins 2012	Not at SCCIC	None
Brown and Maxon 2010	OR-03842	P-30-176946
CEC 2001	Not at SCCIC	None
Farmer 2000	Not at SCCIC	None
Garcia 2009	Not at SCCIC	None
Hoover 2000	OR-02456	None
Mason 1987	OR-02033	None
Padon 1987	OR-00880	None
Romani 1982	OR-00644	None
URS 2001	Not at SCCIC	None
URS 2006	Not at SCCIC	None

Cultural Resources Table 6
Literature Review Results: Studies within 0.25–1.00 Mile of PAA

Author and Date of Study	SCCIC Study Number
Archaeological Associates 1980	OR-00493
Billat 2003	LA-06909
Bonner 2007	OR-03450
Davy 1997	OR-01931
de Barros et al. 2002	OR-02585
de Barros et al. 2005	OR-03316
de Barros et al. 2006	OR-03317
Demcak 1999	OR-02256
Dillon 1997	OR-01629
Duke 2000	OR-02229
Galvin 2012	Not at SCCIC
LADWP 2009	Not at SCCIC
LADWP 2010a	Not at SCCIC
LADWP 2010b	Not at SCCIC
Lapin 2000	OR-02134
Losee 2009	OR-03582
McKenna 1990	LA-02114
McKenna 2001	LA-05215
Mason and Chandler 2003	OR-03614
Moffat t & Nichol 2012	Not at SCCIC
Shepard 2003	LA-06107, OR-2774
Stickel 1991	OR-01272
Strudwick 2004	LA-08487
Strudwick et al. 1996	LA-05890

Of the twelve previous cultural resource studies conducted in the PAA, one was a regional archaeological research design (Mason 1987) and will not be discussed further in this subsection. Hoover (2000) conducted a records search that included the PAA, but no pedestrian survey. The remaining studies comprised pedestrian archaeological surveys in or adjacent to the PAA. These are summarized in chronological order here. Ahlering (1973:2, 58, 63, and 65) reports a scientific resources survey of the city of Huntington Beach, including pedestrian survey, observation of construction grading at known archaeological sites, field inspection of select historic buildings and structures, and test excavations. No cultural resources were documented in the present PAA. Romani (1982) documents an archaeological survey of the proposed widening of PCH. The survey intersected two of the proposed off-site construction parking areas. No cultural resources were identified in these areas. Padon (1987) surveyed a portion of Beach Boulevard adjacent to the proposed off-site construction parking areas at the Beach Boulevard-PCH intersection. No cultural resources were identified.

Staff's examination of documents filed at the Energy Commission for the HBGS Retool Project (00-AFC-13) revealed that a 12-acre portion of the project site was surveyed for the presence of cultural resources. Survey conditions were similar to those described in the present AFC and similar methods were employed in the survey. No cultural resources were identified as a result of the survey. (Farmer 2000:11, Figure 1). The Energy Commission determined that the proposed HBGS Retool Project had the potential to affect buried archaeological resources and imposed nine conditions of certification on the HBGS Retool Project to mitigate any such potential impacts. Included among the conditions was preparation of a cultural resources monitoring and mitigation plan, construction monitoring by a qualified archaeologist, and reporting. Archaeological monitoring was to be conducted in areas where ground disturbance may exceed the depth of fill and in the vicinity of the selective catalytic reduction (SCR) unit. (CEC 2001:49–55; URS 2001:2.) Archaeological monitoring was conducted during construction, June 4–8, 2001 and no cultural resources were identified (URS 2006:5-1). The final report did not contain monitoring logs, photographs, or descriptions of observed subsurface conditions. Monitoring logs for the HBGS Retool Project were submitted to the Energy Commission's compliance project manager at regular intervals during construction; project conditions of certification did not require resubmittal of the monitoring logs in the final cultural resources monitoring report.

Brown and Maxon (2010) surveyed the proposed Poseidon Desalination Plant, which is situated in the historic built environment portion of the present PAA, and recorded three historic fuel storage tanks (P-30-176946; see below, as well as Atkins 2012 and Garcia 2009).

The records search indicates that a total of seven cultural resources have been previously recorded in the records search area (**Cultural Resources Table 7**). Of these, only P-30-176946 is located in the PAA.

Cultural Resources Table 7
Records Search Results: Previously Recorded Cultural Resources

Resource Designation	Type	Description	Project Component	CRHR Status	Source
P-30-149 (CA-ORA-149)	Prehistoric archaeological site	Shell midden	Records search area	Recommended eligible	Ahlering 1973; de Barros et al. 2002, 2005, 2006; Dillon 1997; Douglas 1980; McKinney 1964
P-30-276 (CA-ORA-276)	Prehistoric archaeological site	Unknown	Records search area	Unevaluated	Ahlering 1973
P-30-1531	Natural shell midden	Natural shell midden	Records search area	Recommended ineligible	AES 2012a:5.3-16; Cardenas et al. 2012:4-2; Duke 1999, 2000
P-30-1654 (CA-ORA-1654H)	Historic archaeological site	Dump site	Records search area	Recommended ineligible	de Barros et al. 2002, 2005, 2006; Dillon 1997
P-30-176946	Historic structures	Huntington Beach Generating Station Fuel Tanks	Adjacent to Project Site	Recommended ineligible	AES 2012a:5.3-16; Brown and Maxon 2010:MS-1
P-19-1821	Prehistoric archaeological site	Shell midden	Records search area	Unevaluated	McKenna 1990
P-19-186880	Historic structures	Alamitos Generating Station Fuel Oil Tank Farm	Records search area	Recommended ineligible	Strudwick 2004

P-30-176946

The Edison Plant, currently known as the Huntington Beach Generating Station (HBGS), is a natural gas-fired steam electric generating facility and is composed of a number of buildings and structures. **Cultural Resources Table 8** lists these buildings and structures along with their construction date as found in the AFC.

Cultural Resources Table 8
Buildings and Structures of the Huntington Beach Generating Station

Building/Structure Name	Date of Construction
Power generating Units 1 and 2	1958
Power generating Units 3 and 4	1960–1961
Power generating Unit 5	1969
Administration Building	1958
Office Building	1958
East Fuel Storage Tank	1961
Distillate Fuel Storage Tank	1962
Substation Shed	1958
Switchyard	1960s
Transmission Line Towers	1958
Water Tanks	1958
Water System Building	Unknown
Gas Control Building (and associated pipeline)	1959
Plains Pipeline Terminal Building	ca.1960
Turbine Shelter	ca.1980
RO/EDI Building	ca.1985
GE Phone Interface Building	ca.1960
Gantry Crane and Tracks	1958–1960

HBGS is one of a large system of generation stations that produces power distributed by SCEC throughout Southern California. The HBGS power block has five units that were designed with a once-through cooling system using ocean water. Each unit contains its own boiler, which each serve a single turbine generator. As stated in the AFC, initial construction of the facility primarily took place from 1958–1969 with Units 1 and 2 becoming operational in 1958. Units 3 and 4 followed in 1961, and finally Unit 5 in 1969. Other buildings and structures were built as needed with the latest major additions in the 1980s, as noted in the table above. The project site is substantially covered with hardscape and buildings with only a few trees and shrubs along the perimeter and entrance on Newland Avenue and a small grassy area east of the Administration Building.

Additional Literature Review

Staff conducted additional research at the California History Room of the California State Library in Sacramento as well as online sources, and examined the reports contained in the applicant's records searches to improve the historic map coverage acquired by the applicant (AES 2012b:5.3-1; Cardenas et al. 2012:3-1, Appendix 5.3C; Department of Public Works n.d.). 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, identify locations of potential historic built environment and archaeological resources, and have a partial, chronological record of disturbances in the PAA. To this end, staff attempted to locate a detailed map of the PAA at 10-year intervals[15], beginning about A.D. 1769 and moving toward the present. Even though Sanborn Fire Insurance maps are among the most detailed historic maps available for the urban United States (Karrow and Grim 1990:214, 215), staff did not consult these maps because the PAA was urbanized after the latest fire insurance maps were drafted and therefore would not have been included in the mapping area. All consulted historic maps are presented in **Cultural Resources Table 9**.

[15] 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).

Cultural Resources Table 9
Historic Maps Consulted

Map Name	Scale	Survey Date	Reference
Map of Private Grants and Public Lands	Not specified	About 1869	Day 1869
Map of the County of Los Angeles	1 inch = 2 miles	About 1877	Wildy and Stahlberg 1877
Santa Ana Quadrangle	1 inch = 1 mile	1894	USGS 1896a
Downey Quadrangle	1 inch = 1 mile	1894	USGS 1896b
Corona Quadrangle	30-minute	About 1902	USGS 1902
Alamitos Mining Plat	1 inch = 600 feet	1905	GLO 1905
Supervisorial Districts of Orange County	Not specified	About 1912	McBride 1912
Survey Plat, T 5 S, R 12 W	1 inch = 0.5 mile	1914	GLO 1914
Paved State and County Highways	Not specified	About 1916	McBride 1916
Official Map of Orange County	Not specified	About 1918	Finley and McBride 1918
The Official Map of Orange County	Not specified	About 1922	Finley and McBride 1922
Metzger's Map of Orange County	Not specified	About 1939	Metsker 1939
Santa Ana Quadrangle	1 inch = 1 mile	Culture revised in 1900	USGS 1945
Newport Beach Quadrangle	1 inch = 2,000 feet	Culture/drainage revised from aerials taken 1947	USGS 1949a
Los Alamitos Quadrangle	1 inch = 2,000 feet	Culture/drainage revised from aerials taken 1947	USGS 1949b
Los Alamitos Quadrangle	1 inch = 2,000 feet	Culture/drainage revised from aerials taken 1947	USGS 1950
Newport Beach Quadrangle	1 inch = 2,000 feet	Culture/drainage revised from aerials taken 1947	USGS 1951
Newport Beach Quadrangle	1 inch = 2,000 feet	Aerial photographs taken 1963	USGS 1972
Los Alamitos Quadrangle	1 inch = 2,000 feet	Aerial photographs taken 1963	USGS 1981

Native American Consultation

Methods

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 adopted a Final Tribal Consultation Policy on November 20, 2012. The recently adopted policy exhorts informed agency decision-making by collaborative work 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, then 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, any written responses received, and a written summary of any oral responses in the AFC (20, Calif. Code Regs., §1704[b][2], App. 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, preventing irreparable damage to designated sacred sites, and preventing 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 Land's 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

Both the applicant and 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.

The applicant's consultant, CH2M Hill, contacted the NAHC on August 27, 2011. The NAHC responded on August 31, 2011, indicating that there were no known cultural resources listed in the NAHC Sacred Lands File that were in the project area, and provided a list of Native American contacts. CH2M Hill made letter contact on September 2, 2011 and followed up with phone calls on March 16, 2012. Several tribes responded by asking for additional information.

Staff contacted the NAHC on August 2, 2012, and requested a search of the Sacred Lands File and a Native American contacts list. The NAHC responded on August 4, 2012, 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 one-half mile radius of the proposed project. Staff sent letters to all of the NAHC-listed tribes on November 1, 2012, 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 December 4, 2012. Subsequent email and phone conversations also occurred on December 6, 7, and 12, 2012. Staff received comments from the Juaneño Band of Mission Indians, Acjachemen Nation, and Gabrielino-Tongva Tribe that tribal monitors should be required during project ground disturbing activities. A letter dated June 2, 2013 from the United Coalition to Protect Panhe stated concern that the project site is culturally sensitive and encouraged staff to promote avoidance as mitigation for any cultural resource discoveries connected with the proposed project.

Consultation with Others

Staff consulted with the city of Huntington Beach regarding the history of the area and locally listed historical resources.

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. The background research for the present analysis has identified one previously recorded cultural resource on the project site, P-30-176946 (aka, the Edison Plant and HBGS) (see “California Historical Resources Information System Search” section above), and found that the entire PAA has been subject to cultural resources survey. A further role of background research is to help develop predictive or anticipatory models of the distribution of cultural resources across a project area of analysis. 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 project area of analysis, 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, ethnographic resources, and historical archaeological sites and built-environment resources are developed in this document and draw on information in the “Environmental Setting,” “Prehistoric Setting,” “Ethnographic Setting,” and “Historic Setting” subsections, in addition to information in the “Background Research” subsection. Staff formulated data requests during the discovery phase of the present certification process on the basis of 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

Staff concludes that the likelihood of prehistoric archaeological deposits across the surface of the PAA is low and subsurface prehistoric archaeological deposits could be present in the PAA. According to the “Geomorphology” subsection in this portion of the FSA, the sandy ocean shoreline present today began to form between 6000 and 5000 B.P., and was in place by about 4000 B.P. Particularly in the last 4,000 years, sand spits and droughts periodically closed larger estuaries and open bays, producing shallow lagoons and wetlands attractive to waterfowl (Dillon 1997:11; Masters and Aiello 2007:40). That the proposed project site alternated between hosting a sizable lagoon and a closed marsh, or *bolsa*, is evident on historic maps dating from the late nineteenth century until the 1910s (Day 1869; Finley and McBride 1918; McBride 1916; USGS 1896, 1902, 1945; Wildy and Stahlberg 1877). Remnant marshland paralleling the beach remained in the proposed project site until it was filled between 1947 and 1965 (USGS 1949a, 1951, 1972). While occupied by lagoons, the PAA was dominated by three natural features: (1) a sand spit adjacent to or along the western margin of the

PAA, (2) a lagoon occupying most of the proposed project site, and (3) the lagoon fringe/alluvial plain. While covered by a bolsa, the PAA would have consisted of marshland and small channels that drained the alluvial plain into the marsh. Human habitation with respect to the lagoon would have been restricted to the sand spit and lagoon fringes. The bolsa would have been less desirable for habitation, barring the potential for isolated (and unmapped) knolls within the marsh. Although the PAA was almost completely covered by lagoons or bolsas from at least 1869 through part of the twentieth century, the location of estuaries, lagoons, and bolsas changed over the past 4,000–5,000 years (Engstrom 2006:852, 854). The surface of the PAA, therefore, cannot be assumed to have been uninhabitable for the entirety of the last 5,000 years. Staff finds that the resource base provided by lagoon and marsh habitats would have been a draw to human use and perhaps habitation of the project vicinity. However, shifting, wet ground surface conditions would have been a deterrent. Previously recorded prehistoric archaeological sites in the project vicinity are located at the edges of bluffs and the former bolsa, or along streams uphill from marshy areas. Furthermore, 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 formed no more than approximately 4000 B.P., accounting for less than half of the span of human occupation on this coast. Prior to 4000 B.P., mean sea level was lower than today and watercourses and other aquatic features could have been positioned differently than in modern times, altering the suitability of the PAA for human habitation. The potential to encounter buried prehistoric archaeological resources during construction must be assessed because pre-4000-B.P. landforms in the project vicinity, unless eroded, are buried under the present land surface.

The AFC states that previous ground disturbance at the proposed project site—the only portion of the PAA for which excavation and grading are planned—has reduced the likelihood of encountering buried archaeological resources to a low level. The AFC points out that during construction of the existing HBGS, about 8 feet of clay was removed from the area and replaced with an undisclosed quantity of fill[16]. (AES 2012a:5.3-19, 5.8-3; AES 2012c:5.3-5; Cardenas et al. 2012:4-3.) Staff agrees that the removal of a large package of native sediments and replacing it with fill reduces the probability of encountering buried archaeological resources. However, the discovery probability can only be considered moot if one or more of three conditions are met: (1) proposed ground disturbance is restricted to fill sediments, (2) underlying sediments are older than the expected span of human use of the project vicinity (that is, Pleistocene or older), or (3) Holocene-age sediments in the PAA are eroded or posses other qualities unsuitable to the preservation of archaeological materials. Although the AFC does not adequately address any of these conditions, staff and the applicant sought additional information to clarify these issues through staff's additional research and data requests

[16] Removal of the clay layer apparently was restricted to the areas surrounding the "main building" and "equipment". The AFC does not report its source(s) of information for removal of the clay and subsequent placement of fill. The AFC is unclear about the identity and location of the "main building" and "equipment". (AES 2012a:5.8-3; AES 2012b:5.3-5; Cardenas et al. 2012:4-3.)

(AES 2012b; AES, with CH2M Hill 2012:41–48; CEC 2012a:12–15; Miller 2012a, 2012b).

Whether the applicant would encounter buried archaeological deposits during construction depends on several factors, including the depositional character and 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. The information provided in the AFC and staff analysis do indicate that the proposed project site is in a depositional environment where buried former land surfaces and associated archaeological materials have the potential to be found. Much or all of any such deposition would have occurred within the last 10,000 years. For example, at least one buried prehistoric archaeological site (P-30-1644) has been identified about 11 miles northwest of the proposed project site in a similar, former estuarine setting under 6 feet of fill (Willey 2006). Moreover, between 5450 and 2950 B.P., relatively sedentary (semi permanent) occupations formed around Orange County estuaries (Grenda and Altschul 2002:127). The Environmental and Prehistoric settings in this FSA show that estuarine and marine environments contain abundant resources, which would have been a draw to human use of the project vicinity. Given these qualities of the PAA, staff believes that the PAA could contain buried archaeological resources.

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, used, or cherished, this additional information can provide greater understanding for identification efforts, making significance determinations per CEQA; eligibility determinations for 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.

Step 1 involves reviewing the project description and mapped project location and, based upon the geographic and environmental setting, formulate preliminary guiding questions or research themes 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 an 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 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 Research Themes

Based upon the project description and project location maps, two preliminary guiding research themes were developed.

- Research specific Gabrielino Tongva procurement and usage of resources found in Southern California estuary environments and specifically the estuary of Santa Ana River and the adjacent Newport Bay.
- Research the history of Gabrielino settlements near the estuary of Santa Ana River and the adjacent Newport Bay.

As documented previously in this cultural resources section (“Native American Consultation”), staff made preliminary contact with Gabrielinos and Juanenos affiliated with the project area.

As 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 about Native American activities in the Santa Ana River and the adjacent Newport Bay.

Field Visit

Ethnographic staff visited the project area and vicinity on October 9, 2013.

Ethnographic Method Constraints

None.

Model of Historical Archaeological Resources

The analysis of the information in the “Environmental Setting,” “Historic Setting,” and “Literature and Records Search” subsections leads to the conclusion that historic archaeological deposits are likely present in low frequency across the surface of the PAA and subsurface historic archaeological deposits are most likely present in low to moderate frequencies as well.

Although historic maps show that the project vicinity was dominated by open lagoons and swamps from the late nineteenth through middle twentieth centuries, squatters were known to inhabit the swamps and railroads and agricultural enterprises took root in the area by the turn of the twentieth century (Milkovich n.d.:1; USGS 1945). Three duck or gun clubs—Newport, Pacific, and Surf—frequented the swamps of the project vicinity as well (Finley and McBride 1918). No substantive construction is evident on historic maps of the proposed project site until sometime between 1939 and 1947, by which time a sewage disposal site and Huntington Beach Airport were situated in the northern half of the proposed project site. The two facilities combined comprised five buildings, one tank, and an airstrip. (Metsker 1939; USGS 1949a, 1951.) Both facilities were removed by 1965 (USGS 1972). Buried historic archaeological resources in the PAA are therefore expected to consist of refuse deposits associated with small-scale domestic, agricultural, and industrial disposal, as well as structural remains of the former sewage disposal site. The likelihood of encountering such resources is low in the southern two-thirds of the proposed project site, moderate in the northern third.

Cultural Resources Inventory Fieldwork

The field efforts to identify cultural resources in the PAA consist of the applicant’s pedestrian archaeological and historic built-environment surveys, and staff’s field visit to the proposed project site. No new cultural resources have been found in the PAA in addition to P-30-176946. On the basis of the background research for the present analysis and the results of the field efforts that are presently available, the total cultural resources inventory for the PAA includes no archaeological or ethnographic resources, and one built-environment resource.

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 area. 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.

Pedestrian Archaeological Surveys

Primary Pedestrian Archaeological Survey

Methods

As stated in the AFC, an archaeologist meeting the Secretary of the Interior's professional qualifications surveyed the proposed project site, offsite construction laydown area, and on- and offsite construction parking areas on September 28–29, 2011. The proposed project site consisted primarily of buildings, structures, pavement, and hardscape, rendering ground surface visibility to zero except in a few areas of broken pavement and missing gravel. These areas were visually inspected as they were encountered. Within the 200-foot survey buffer, the archaeologist encountered streets, sidewalks, a concrete-lined canal, and an open area in the southeastern corner of the proposed project site. The archaeologist surveyed the latter area by walking transects spaced 30 feet apart; the other areas were visually examined as conditions allowed. (AES 2012a:5.3-16, 5.3-19, Figure 5.3-1; AES 2013:5.3-26, Figure 5.3-1.)

The proposed offsite parking areas at the northeastern and southwestern corners of Beach Boulevard and PCH are completely paved lots and were not surveyed by the applicant's consulting archaeologist. The proposed offsite parking area within the Plains All American Tank Farm property, adjacent to the proposed project site, was found to contain fill sediments, structures, and hardscape. The offsite parking area adjacent on the northwestern corner of the proposed project site is covered in gravel. The proposed offsite construction laydown area at the Alamitos Generating Station was found to be graded. No native soils were visible on the surface. (AES 2012a:5.3-19, Figure 5.3-1; AES 2013:5.3-26, Figure 5.3-1; Cardenas et al. 2013.)

Staff's September 28, 2012 site visit to the HBEP project site and March 25, 2014 site visit to the Alamitos Generating Station confirmed the applicant's field observations.

Results

No archaeological resources were identified in the PAA as a result of the survey (AES 2012a:5.3-19; AES 2013:5.3-27).

Results of Ethnographic Resources Investigations

Staff research suggests that any ethnographic resources that may be in the project vicinity—specifically the ethnographic villages or camps named Lopuuknga, Kenyaanga and one unnamed camp or village—are not likely to be in the proposed project site because it is predominately located on fill materials that covered over former estuary or marsh lands associated with the Santa Ana River. However, the coastline in this area is dynamic and shifts and one village or camp could have been near the project area.

As a result of ethnographic research, staff concludes that there are no known ethnographic resources that will be impacted by the proposed project.

Historic Built Environment Survey

Methods

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 applicant. On September 28, 2012, staff performed a survey of the project site as well as the surrounding area in order to determine potential impacts of the proposed project on built-environment resources.

Results

For the proposed HBEP, efforts have led to the identification of one built-environment historical resource in the PAA, P-30-176946 (the Edison Plant), which is currently listed on the city's Local Landmarks list as a result of the 1986 Study. As was previously stated in the summary of conclusions, in 2008, Galvin Preservation Associates was contracted by the city to update and expand the city's existing 1986 Study. The findings of the most recent survey have been documented in a report, *City of Huntington Beach Historic Context & Survey Report*, and submitted to the city for their review (Galvin 2012). The latest version of this report was prepared in December 2012. This latest report recommends that the Edison Plant is not eligible for the NRHP, CRHR, or for local listing. Additionally, it is not listed on, nor has been found eligible for, either the NRHP or the CRHR in any documentation provided by the applicant or discovered by staff to date.

Based on the preponderance of evidence that the Edison Plant is not a historical resource under CEQA, staff recommends that the Presiding Committee and Energy Commission make a determination of ineligibility for listing on the CRHR. The Galvin Report continues to be under consideration by a standing committee of the Huntington Beach Historic Resources Board, and no action has been taken to update the register as of March 25, 2014. While the resource remains listed on the local register, if the property was not determined historically significant by following the Office of Historic Preservation procedures and requirements (preparation of a DPR 523 inventory form following "Instructions for Recording Historical Resources"), it is possible that the original determination of historical significance was not detailed enough for the Energy Commission to rely on for determining whether the subject resource is an historical resource for the purposes of CEQA. This would most likely apply to the original 1986 study that resulted in the resource being listed as a local landmark in the 1996 General Plan Historic and Cultural Resources Element (HB 1996). Therefore, with the additional survey information available to staff at the present time, staff concludes that the resource, as identified in the 1996 General Plan (HB 1996), Community Development Chapter, Historic and Cultural Resources Element, Table HR-2, was included without the benefit of more rigorous current OHP practices. Therefore, staff does not anticipate a conflict between demolition of the plant and listing on the local register. No mitigation measures are recommended to ensure conformance with local LORS as there are no impacts to historical built environment resources.

Interpretation of Results

Model of Prehistoric Archaeological Resources

The AFC asserts that the PAA has little potential to contain prehistoric archaeological resources on the ground surface because of the degree of surface disturbances and development. The AFC states that buried archaeological resource potential also is low, assuming that all construction-related ground disturbance would occur in imported fill deposits. Staff conducted further research and analysis to estimate the depth of fill across the proposed project site; whether and where proposed excavation would penetrate native sediments; and the age, characteristics, and preservation potential of any underlying native sediments.

The AFC and supporting documentation state that the project site rests atop 2–3 feet of fill dirt in the vicinity of the proposed combined-cycle gas turbine Block 1 (AES 2012a:5.8-3; Ninyo & Moore 2011:Boring Logs 1–2, Figure 3). In addition, the AFC reports that prior to the original construction of the HBGS, approximately 8 feet of a natural clay layer was removed from portions of the HBGS and replaced with engineered fill (AES 2012a:5.8-3; AES 2012b:5.3-5; Cardenas et al. 2012:4-3). The amount of sediment removed from the HBGS site actually varied from about 2 to 23 feet, according to the applicant’s response to Energy Commission Data Requests 35 and 36 (AES, with CH2M Hill 2012:Figure DR35-1).

Project-specific borings and cone-penetration test indicate that the underlying natural sediments are wind-deposited (eolian) sediments and alluvium or estuarine sediments. The eolian sediments were removed during construction of the HBGS and were not encountered during geotechnical testing. Estuarine/alluvial sediments were encountered to a depth of 9–23 feet below ground surface. These deposits were interbedded layers of very soft to stiff clayey silt and silty clay, as well as loose, silty sand and sandy silt. Shell fragments were found throughout the estuarine/alluvial deposits. Beneath the estuarine/alluvial sediments are marine sediments to the maximum extent of testing, which was 51.5–75.5 feet below the present ground surface. Marine sediments were dense, poorly graded sand with silt as well as poorly graded sand, all of which contained shell fragments. (AES 2012a:5.8-6, 5.8-7; Morton 2004; Ninyo & Moore 2011:5–6, Boring Logs 1–2.)

Radiocarbon dates from the adjacent, proposed Poseidon Desalination Project support the notion that the natural sediments under the proposed project site are Holocene in age and therefore, could contain archaeological resources. Moreover, the radiocarbon dates from Poseidon suggest that the natural sediments most likely to be affected by HBEP construction formed over approximately the last 4,000 years B.P. The radiocarbon dates are relevant to the proposed HBEP because of their proximity to the PAA, similar environmental context and elevation, and comparable sedimentary sequences.

Poseidon borings encountered about 9 feet of fill, followed by 4 feet of estuarine clay and 72 feet of interbedded marine deposits. The latter are dense to very dense sands with varying amounts of marine shell fragments and thin layers of clay and silt. (Geologic Associates 2002:4.)

Nine radiocarbon assays were obtained from four borings in the Poseidon project area, ranging from -7.4 to -74.4 feet asl. The calibrated radiocarbon date from estuarine sediments (-7.4 feet asl) is 1940 B.P., while the shallowest date from marine contexts (-17 feet asl) is 4250 B.P. (Geologic Associates 2002:Table 1.) These dates tentatively place the onset of estuarine conditions in the project vicinity at about 4200 B.P., consistent with the geomorphological discussion contained in the “Environmental Setting” subsection of this FSA.

The fine clays and silts of the proposed project site’s estuarine sediments are indicative of low-energy deposition with moderate to high archaeological preservation potential. The presence of coarser-grained sediments (silty sand and sandy silt) within estuarine sediments is suggestive of periodic pulses of alluvial sediment from streams and a higher-energy movement of sediment. Accordingly, archaeological resources at the interface of low-energy and high-energy estuarine deposits may have been eroded. Where such interfaces exist in the PAA, preservation potential would be lower. On the whole, staff estimates the non-fill subsurface of the PAA as moderately sensitive for the presence of buried prehistoric resources.

Model of Historical Archaeological Resources

As discussed previously in this cultural resources section, the extent of disturbance and amount of pavement and superstructure covering the PAA makes it unlikely that historic archaeological resources would be or could be found on the present ground surface. The cultural resources inventory results corroborate this expectation, since no historic archaeological resources were identified on the surface of the PAA and both the applicant and staff used appropriate identification methods.

The potential for buried historic archaeological deposits to occur in the PAA is variable. Structural remnants of the former sewage disposal site and Huntington Beach Airport may be preserved in the northern portion of the PAA, although there is a high probability that some or all such remnants were demolished and removed to permit construction of the SCEC facility and current HBGS. More likely to occur in the PAA are smaller structural remnants—artifact scatters formed of metal, concrete, and glass building fragments (resulting from demolition)—and refuse scatters associated with industrial disposal practices. Any refuse scatters, too, may have been removed to allow construction of the present facilities. Additionally, the possibility exists that historic artifacts were transported to the PAA within the fill sediments.

California Register of Historical Resources Eligibility

No CRHR-eligible cultural resources have been identified in the PAA.

DIRECT/INDIRECT IMPACTS AND MITIGATION

In the abstract, direct impacts to cultural resources are those associated with project development, construction, and operation. Construction involves 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 power 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 a proposed power plant in a 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

No positive identification of buried prehistoric or historic archaeological resources has been made by staff or the applicant. However, the sediments under the proposed project site are of the right age to have supported the formation of archaeological resources from approximately 4250 B.P. through the middle twentieth century. Preservation potential exists for any such resources as well.

The likelihood that the proposed project would actually result in significant impacts to buried archaeological resources appears low, however. Consulting **Cultural Resources Tables 2–4**, the record shows that seven project elements are known to involve construction to a depth that would intersect non-fill sediments, where archaeological resources would most likely be preserved. These project elements consist of the proposed Block 2 CCGT/HRSG foundation slab, Block 1 STG foundation, grounding anodes, and four single-circuit power poles. The Block 2 CCGT/HRSG foundation slab would require excavation of a 50-foot-by-130-foot area about 0.5 feet into native sediments; excavation would most likely be accomplished via mass soil removal, assisted by an excavator. The Block 1 STG foundation would involve excavation of a 60-foot-by-55-foot area about 1.5 feet into native sediments. The grounding anodes would be pressed or vibrated into the ground surface up to 7 feet into native sediments. The power poles would be excavated by a 6-foot-diameter auger up to 9.6 feet into native sediments. The proposed parking areas and laydown area do not involve subsurface ground disturbance and therefore their use would have no impact potential for buried archaeological resources.

The proposed excavations described in the previous paragraph all could damage or destroy buried, as-yet-unidentified archaeological resources in the proposed project site. The potential to destroy archaeological resources is greatest with the proposed Block 2 foundation slab and Block 1 STG foundation because they would require the greatest areal extent of digging. The grounding anodes and power poles, on the other hand, have relatively small footprints and would be more apt to damage buried archaeological resources rather than destroy them. Nevertheless, both the large- and small-footprint excavations could compromise the information potential of archaeological resources by altering the association of artifacts and features, as well as by damaging or destroying them. Such effects are considered significant impacts under CEQA.

Under other circumstances, staff would request that the applicant conduct an excavation-supported geoarchaeological study to determine the likelihood of encountering buried archaeological deposits in the proposed project site. In the present case, however, staff believes that a disproportionate amount of excavation into non-fill sediments would be required for such a study when compared to the potential project impacts. Furthermore, the existence of radiocarbon dates from an adjacent property in the same environmental setting gives staff high confidence that while the potential for buried archaeological deposits under the proposed project site is moderate, the limited amount of excavation into non-fill sediments proposed renders the probability of encountering any such resources low. Therefore staff concludes that existing information is adequate to assess potential impacts and that the Energy Commission’s historic preservation responsibilities are best served by implementing a cultural resources mitigation and monitoring program for the proposed project. Implementation of such a program would reduce the potential project impacts to a less-than-significant level.

The AFC contains an outline of such a program, consisting of nine parts:

1. Designated Cultural Resources Specialist (CRS)
2. Construction Worker Training
3. Monitoring
4. Emergency Discovery
5. Site Recording and Evaluation
6. Mitigation Planning
7. Curation
8. Report of Findings
9. Inadvertent Discovery of Human Burials. (AES 2012a:5.3-24–5.3-26.)

Although staff agrees that these components are important to an effective mitigation and monitoring program, staff also proposes a cultural resources mitigation and monitoring plan (CRMMP) with an explicit research design and procedures for the treatment of archaeological and human remains discoveries that may occur during construction. The absence of explicit consideration of the resource types expectable in the PAA and the methods required to evaluate any such resources leaves important decision-making to the time least amenable to responsible historic preservation practice—the moment of inadvertent discovery. In addition, staff proposes a provision for construction monitoring by local tribal representatives. As described earlier under *Native American Consultation*, some consulted tribal representatives urged that tribal monitors be present during construction because archaeological materials encountered in the PAA would likely be related to their Gabrielino culture. In addition there is a slight potential for buried ethnographic resources in the vicinity of the project and most likely affiliated with the unnamed village/camp mentioned in the ethnographic section above. Staff therefore proposes Conditions of Certification (conditions) **CUL-1** through **CUL-8**, incorporating portions of the applicant's proposed mitigation measures, to reduce the HBEP's 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 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-8** would reduce these potential impacts to a less-than-significant level.

Identification and Assessment of Direct Impacts on Built-Environment Resources and Proposed Mitigation

Based on the preponderance of evidence that the Edison Plant is not a historical resource under CEQA, staff recommends that the Committee/Commission make a determination of ineligibility for listing on the CRHR. Therefore, there are no direct project impacts on historic built environment resources and consequently no mitigation is recommended.

Indirect Impacts

Neither the applicant nor staff has identified any indirect impacts on any cultural resources that qualify as historical resources or unique archaeological resources under CEQA. Staff believes, therefore, that mitigation for indirect impacts is not necessary for the proposed project.

Operation Impacts and Mitigation

During operation of the proposed project, if a leak should develop in buried pipelines within the project site, repair of the buried utility could damage previously unidentified, subsurface archaeological resources in areas unaffected by the original excavation. The measures proposed above and below for the mitigation of impacts to previously unknown archaeological resources found during construction would also mitigate impacts that occur during operation-phase repairs.

Long-term Impacts

Staff has not identified long-term impacts 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 (14 Calif. Code Regs., §15130). Cumulative impacts to cultural resources in the project vicinity could occur if any other existing or proposed projects, in conjunction with the proposed HBEP, 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 HBEP and other proposed projects in the vicinity could have a significant cumulative 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 HBEP and other proposed projects in the vicinity could also have a significant cumulative impact to cultural resources.

For the purposes of this cumulative impacts analysis, staff has determined that the cumulative area of analysis for archaeological resources comprises the open coastline from San Pedro southeast to the San Joaquin Hills and northeast on the Los Angeles Plain to the foot of the Santa Ana Mountains, approximately a 20-mile radius from the proposed project site (see **Cultural Resources Figure 1**). Staff selected this area for the archaeological cumulative impact analysis because it forms a geographic unit that was probably meaningful to the prehistoric human inhabitants of the project vicinity and encompasses a similar range of cultural resource types throughout: prehistoric shell midden, occupation, and resource processing sites; historic industrial resources; historic refuse scatters; and the remnants of historic residences and commercial properties. Accordingly, the 20-mile radius from the project site forms 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 20-mile radius that would result in ground disturbance because excavation is the primary vehicle for cultural resources impacts for the proposed project. Staff presents its list of cumulative projects for cultural resources in **Cultural Resources Table 10**.

Staff identified 42 projects within the 20-mile archaeological cumulative analysis area that are relevant to assessing the HBEP's contribution to cumulate impacts (**Cultural Resources Table 10**). Staff was unable to locate environmental documentation for seven of the cumulative projects, rendering these projects' contribution to cumulative impacts as unknown. Five of the cumulative projects would affect, in aggregate, eleven archaeological resources. Mitigation measures were proposed to reduce archaeological impacts to a less-than-significant level. Six of the projects were determined to have no impact on cultural resources, while the remaining 24 projects had the potential to affect unknown archaeological resources or human remains, but proposed mitigation was regarded as sufficient to reduce the potential impacts to a less-than-significant level. Similarly, construction of the proposed HBEP could result in damage to as-yet-unidentified archaeological resources or human remains, or both. Such resources could qualify as historical resources or unique archaeological resources, as defined by CEQA, and therefore damage to these kinds of resources would be a significant impact under CEQA. Staff, however, proposed Conditions of Certification **CUL-1** through **CUL-8** to reduce this potential impact to a less-than-significant level. These eight conditions of certification provide a comprehensive construction monitoring and discovery response protocol that would reduce the damage done to archaeological resources and human remains, and compensate for damage inadvertently caused during construction. Since the impacts from the proposed HBEP would be mitigated to a less-than-significant level by the project's compliance with proposed Conditions **CUL-1** through **CUL-8**, and since similar protocols have been applied to other projects in the area, staff does not expect any incremental effects on archaeological resources of the proposed HBEP to be cumulatively considerable when viewed in conjunction with other projects.

The cumulative area of analysis for built environment cultural resources is the city of Huntington Beach. Of the 25 past, present, and foreseeable projects proposed in the city, six have the potential to have significant impacts on built environment historical resources: the Warner-Nichols Project, Archstone Residential Project, Beach and Ellis Project – Elan Apartments, Edinger Walmart project, and the Former Lamb and Wardlow School sites. Some of these projects either have not gone through the environmental review process or the documents were inadequate to determine if built environment historical resources could be impacted. In order to be as conservative and inclusive as possible, the six projects included in this cumulative analysis include project sites with historic-age buildings, regardless of whether or not an eligibility determination was made. 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 Huntington Beach.

Cultural Resources Table 10
Summary of Cumulative Projects—Archaeological Resources

Project Title	Number on Figure[1]	Location	Project Description	Resources Affected/Level of Significance	References
Poseidon Desalination Plant	79	Cities of HB and Costa Mesa	Construct and operate a seawater desalination facility in Huntington Beach, including the facility, electrical substation, booster pump stations, and transmission pipelines	No impact	Brown and Maxon 2010:16; RBF 2005:5.9-28
Beach and Ellis Mixed-Use Project	49	City of HB, 18502 and 18508 Beach Blvd	Apartment complex, 8,500 sf commercial property, and 48,000 sf of open space	None/LTSWM	Atkins 2011a:Section 4.4
ASCON Landfill Site	7	City of HB, southwest corner of Magnolia St and Hamilton Ave	Hazardous material cleanup	None/LTSWM	Garcia 2009; PCR 2009:30–32
Beach and Edinger Corridors Specific Plan	3	City of HB, Beach Blvd–Edinger Ave corridor	Development planning tool	SU	PBS&J 2009:Section 4.4
The Boardwalk (formerly Murdy Commons)	26	City of HB, northeast corner of Edinger Ave and Gothard St	Develop up to 984 dwelling units and commercial area on a 12.5-ac site. All existing improvements on the project site would be demolished.	Potential archaeological damage/LTSWM	PBS&J 2010a:Section 4.4
Brightwater Specific Plan and Annexation	2	City of HB, County of Orange	Annex a housing development into the city	No impact; Native American human remains found previously	Carcamo 2008a–e, 2009; HB n.d.a:28–29
Huntington Beach Senior Center	46	City of HB, Talbert Ave at Golden West St	Build 45,000-sf senior center in Central Park	P-15-142, potential damage to archaeological resources and human remains/LTSWM	Atkins 2011b:Section 4.4; EIP 2007:Section 4.4; O'Neil and Hunt 2007:29–30; PBS&J 2007:Section 4.4

Project Title	Number on Figure[1]	Location	Project Description	Resources Affected/Level of Significance	References
Tri Pointe Homes Wardlow Residential Subdvision	59	City of HB, 9191 Pioneer Drive	Demolish all existing improvement, develop 49 single-family homes	Potential impacts to archaeological resources, Wardlow School, and human remains/LTSWM	HB 2012a:61–64
Vans Skate Park	21	City of HB, between Center and Mcfadden avenues	Build skate park	Potential damage to archaeological resources, human remains/LTSWM	PCR 2012a:35–36
The Village at Bella Terra	25	City of HB, 7777 Edinger Ave	Build mixed-use commercial and residential project	Potential damage to archaeological resources, human remains/LTSWM	PBS&J 2008a:Section 4.4; PBS&J 2010b:3-3
Huntington Beach Lofts (formerly The Ripcurl Project)	24	City of HB, 7302–7400 Center Ave	Build mixed-use commercial & residential development	Potential damage to archaeological resources, human remains/LTSWM	PBS&J 2008b:Section 4.4
Hilton Waterfront Beach Resort Expansion	77	City of HB, 21100 Pacific Coast Highway	Build tower to 9 stories, meeting space, eateries	Potential damage to archaeological resources/LTSWM	Atkins 2012:3-34
Tri Pointe Homes Lamb Residential Subdivision	56	City of HB, 10251 Yorktown Ave	Demolish Lamb School, create 81 residential lots	Destruction of Lamb School, potential damage to archaeological resources, human remains/LTSWM	HB 2012b:64–67
Harmony Cove Marina Development	35	City of HB, 3901 Warner Ave	23-boat slip marina, eatery, office, retail, recreational rentals	No impact	HB n.d.b:41–42
P2-92 Sludge Dewatering & Odor Control	82	City of HB, Santa Ana River channel	Build new sludge and odor control facilities at existing Plant 2	Potential damage to human remains/LTSWM	OCSD 2012:11–12
Edinger Walmart	28	City of HB	Build new retail in existing space	Unknown	None
Newport Beach City Hall Reuse Project	94	City of Newport Beach	Mixed use project, up to 15,000 sf retail or community center & up to 99,675 sf hotel	Potential damage to archaeological resources, human remains/LTSWM	Keeton Kreitzer Consulting 2012
Mater Dei High School Parking Structure	29	City of Santa Ana, 1202 W. Edinger Ave	Three-level parking structure	Unknown	None
Coastal Treatment Plant Export Sludge Force Main Replacement	21	Aliso Viejo, AWMA Rd at Alicia Pkwy	Replacement of 16,600 ft of two 4-inch iron pipelines, eastern side of Aliso Creek	Damage to CA-ORA-581, CA-ORA-582, & unknown archaeological resources/LTSWM	DUDEK 2012a:4.5-14, -15
Sexlinger Farmhouse & Orchard Residential Development Project	15	City of Santa Ana, E. Santa Clara Ave at Tustin Ave	Construct 24 single-family homes on 5 ac	Potential damage to unknown archaeological resources/ LTSWM	URS 2013:5-41

Project Title	Number on Figure[1]	Location	Project Description	Resources Affected/Level of Significance	References
Los Trancos Facilities Improvements	109	Laguna Beach, PCH & Crystal Cove State Park	Parking and path improvements	LTS	DPR 2012:29
Cypress Community College AST	7	Cypress, 9200 Valley View St	Construct storage tank	Unknown	Unknown
Radha Raman Vedic Mandir	5	City of Placentia, 1022 N. Bradford Ave	Build church	Unknown	Unknown
ND-12-02 Aliso Creek Pedestrian Bridge/Service Road	106	City of Laguna Woods	Replace pedestrian bridge with new build	Unknown	Unknown
Warner-Nichols Project	34	City of HB, Warner Ave at Nichols Lane	Demolish six buildings	Potential damage, unknown archaeological resources/LTSWM	ICF 2012:3.1-19–3.1-21
Back Bay Landing Project	95	City of Newport Beach, East Coast Hwy at Bayside Drive	Mixed commercial/residential project, underground parking structure	Potential damage, unknown archaeological resources/PS	PCR 2012b:3-7, 3-8
Robert Diemer Filtration Plant Improvements	4	Yorba Linda, Valley View Ave/Bastanchury Rd	New reservoir foundation, install underground pipelines	Unknown	Unknown
Uptown Newport Village	63	City of Newport Beach, Jamboree Rd at Fairchild Rd	Mixed-use retail and residential project	Potential damage, unknown archaeological resources/LTSWM	The Planning Center 2012:5.4-9
Well #6 Colored WTP	52	City of Costa Mesa, Harbor Blvd at Gisler Ave	Construct WTP	Unknown	Unknown
Santa Fe Depot Specific Plan	11	City of Orange, between Walnut and Palmyra avenues	Potential infill development at as many as 11 locations	Potential damage, unknown archaeological resources/LTSWM	HDR 2012:5.2-28
Recycled Water Distribution System Expansion	90	Laguna Hills and Laguna Woods, Ridge Route Dr & Moulton Pkwy	Install 18 mi of water pipelines under existing roads	Potential damage to CA-ORA-14, -15, -268, unknown sites/LTSWM	DUDEK 2012b:52
Recycled Water Tertiary Treatment Plant	92	Laguna Hills and Laguna Woods, Ridge Route Dr & Moulton Pkwy	Build tertiary treatment facilities and transmission pipeline	None/LTS	DUDEK 2012c:52–54
General Plan Update EIR (North Newport Center)	93	City of Newport Beach	Increase the multi-family residential development allocation from 430 units to 524 units on 121 ac	Potential damage, unknown archaeological resources, human remains/LTSWM	T&B 2012:4-22, 4-23
Civic Center and Park Project	100	City of Newport Beach, Avocado Ave & McArthur Blvd	Construction of park, city hall building, and 450 parking spaces	Potential damage to CA-ORA-167/1117, -1461, -139, human remains/LTSWM	LSA 2009:4.6-17–4.6-24

Project Title	Number on Figure[1]	Location	Project Description	Resources Affected/Level of Significance	References
Fountain Valley Civic Center Specific Plan	42	City of Fountain Valley, Brookhurst St and Slater Ave	Build Ayres Hotel, 88 residential units (27 single-family, 61 townhomes), and 2,300 sf of retail space on 8.62 ac	No impact	Fountain Valley 2011:21
Pierside Pavilion Expansion	75	City of HB, 300 PCH	Expansion of the existing Pierside Pavilion development	No impact	HB 2012c:30
Hyundai Motor America Corporate Campus Project	45	City of Fountain Valley, 10550 Talbert Ave	Expansion of existing corporate headquarters with a 469,000-sf campus	LTS	RBF 2012:10-4, 10-5
Yakult USA Manufacturing Facility	36	City of Fountain Valley, 17256 Newhope St	Build a 77,000 sf manufacturing facility on 8.8 ac	No impact	Fountain Valley 2012:33–34
Great Park Neighborhoods (Heritage Fields)	4	City of Irvine, former El Toro Marine Air Station	Build residential housing, parks, and sports fields/complex	Potential damage to unknown archaeological resources, human remains/ LTSWM	Irvine 2012:8-5, 8-6
Vista Verde	66	City of Irvine, 5144 Michelon	Build 55 unit project, which is proposing to add 3 additional units to the project	Potential damage to unknown archaeological resources, human remains/ LTSWM	MBA 2010:14–15
Pacific City	76	City of HB, 21002 Pacific Coast Highway	Build 516 residential apartments, retail, commercial, and hotel on 31 ac	Damage to CA-ORA-149, -1582H, unknown human remains/LTSWM	EIP 2003:3.4-16–3.4-20
2802 Kelvin Ave	Vicinity of 53	City of Irvine	Build 384 apartment units	Potential damage to unknown archaeological resources, human remains/LTSWM	Templeton 2007:5.5-4–5.5-6

1. Number given on **Cultural Resources Figure 1**.
Notes: ac = acre(s); AST = aboveground storage tank; Ave = avenue; Blvd = boulevard; Dr = drive; EIR = environmental impact report; ft = feet; HB = Huntington Beach; Hwy = highway; LTS = less than significant; LTSWM = less than significant with mitigation; mi = miles; Pkwy = Parkway; PS = potentially significant; Rd = road; sf = square feet; St = street; SU = significant and unavoidable impact; WTP = water treatment plant

COMPLIANCE WITH LORS

Staff concludes that the proposed project would comply with the LORS listed in **Cultural Resources Table 1**. Staff has not identified any cultural resources in the PAA that would qualify as historical or unique archaeological resources for the purposes of CEQA. Although impacts to as-yet-unidentified archaeological resources that qualify as historical or unique under CEQA could occur during construction and operation of the proposed project, staff-proposed Conditions of Certification **CUL-1** through **CUL-8** are expected to mitigate such impacts to less-than-significant levels. These conditions establish the necessary protocols to constructively handle the issues identified in **Cultural Resources Table 1**: the treatment of human remains discoveries during project-related ground disturbance (**CUL-1–CUL-8**), prevention of unauthorized removal of Native American remains or artifacts from a Native American grave or cairn (**CUL-1–CUL-8**), and non-disclosure of records pertaining to ethnographic consultants or archaeological site information (**CUL-3**). Since the preponderance of evidence suggests that the Edison Plant is not an historical resource for the purposes of CEQA, and the city of Huntington Beach will likely adopt Galvin's (2012) recommendation that the Edison Plant warrants delisting, staff does not anticipate a conflict between demolition of the plant and listing on the local register.

NOTEWORTHY PUBLIC BENEFITS

The AFC does not identify any noteworthy public benefits concerning cultural resources (AES 2012a:1-13, 1-14). Although the proposed facility's shorter stacks would create a less obtrusive profile, staff has not identified historical resources in the PAA that the proposed project would affect visually. Therefore, staff concludes that the proposed HBEP's reduced height would not constitute a noteworthy public benefit in the area of cultural resources.

RESPONSE TO AGENCY AND PUBLIC COMMENTS

Staff has not received any comments on cultural resources from the public. Staff received a comment letter from one other agency (NAHC) where some mention is made of cultural resources. The NAHC indicated to staff that the NAHC's Sacred Lands File does not contain record of Native American cultural resources in the project vicinity; prior to the Energy Commission's consultation efforts, the applicant received a similar letter from the NAHC. The Juaneño Band of of Mission Indians Acjachemen Nation and Gabrielino-Tongva Tribe informed staff that they believe that tribal monitoring should be implemented during construction of the proposed project. The United Coalition to Protect Panhe is concerned about the cultural sensitivity of the project site. (see "Native American Consultation", earlier in this document.)

CONCLUSIONS, RECOMMENDATIONS, AND RECOMMENDED FINDINGS OF FACT

Staff concludes that the proposed project could result in a substantial adverse change to as-yet-unidentified archaeological resources that qualify as historical or unique archaeological resources under CEQA, which is a significant impact under that act. However, staff finds that implementation of Conditions of Certification **CUL-1** through **CUL-8** would reduce this impact to a less-than-significant level. Staff recommends that the Energy Commission adopt these cultural resources conditions of certification.

CUL-1 and **CUL-2** are administrative conditions that set out 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 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. **CUL-7** defines the protocols, responsibilities, and timeframes involved in responding to inadvertent archaeological or human remains discoveries. **CUL-8** describes the manner in which the project owner is to conduct cultural resources inventory and analysis in the event that procurement of construction materials must occur at off-site, non-commercial properties. **CUL-4** requires that the project owner prepare a final report of all cultural resources activities undertaken during construction of the proposed project.

In summary, staff recommends the following finding of facts.

- Staff recommends that the proposed project, as currently described, would not result in impacts on known archaeological or ethnographic resources.
- Staff recommends that the Edison Plant does not qualify as an historical resource for the purposes of CEQA.
- Staff recommends the adoption and implementation of Conditions of Certification **CUL-1** through **CUL-8** to ensure that all significant impacts to archaeological historical resources discovered during HBEP project construction -- including the potential project use of borrow and disposal sites -- and operation are mitigated below the level of significance.
- Staff recommends that construction and operation of the HBEP, project as currently proposed, and full implementation of all cultural resources conditions of certification would ensure compliance with all applicable LORS, plans, and policies identified in **Cultural Resources Table 1**.

PROPOSED CONDITIONS OF CERTIFICATION

CUL-1 Prior to the start of ground disturbance (as defined in the Compliance Conditions section); post-certification cultural resources activities (including but not limited to “survey”, “in-field data recording,” “surface collection,” “testing,” “data recovery” or “geoarchaeology”); or site preparation or subsurface soil work during pre-construction activities or site mobilization; the project owner shall obtain the services of a Cultural Resources Specialist (CRS) and one or more alternate CRS. The project owner shall submit the resumes and qualifications for the CRS, CRS alternates, and all technical specialists to the Compliance Project Manager (CPM) for review and approval.

The CRS shall manage all cultural resource monitoring, mitigation, curation, and reporting activities, and any post-certification cultural resource activities (as defined in the previous paragraph), unless management of these is otherwise provided for in accordance with the cultural resource conditions of certification (conditions). The CRS shall serve as the primary point of contact on all cultural resource matters for the Energy Commission. The CRS may elect to obtain the services of Cultural Resource Monitors (CRMs), Native American Monitors (NAMs), and other technical specialists, if needed, to assist in monitoring, mitigation, and curation activities. The project owner shall ensure that the CRS makes recommendations regarding the eligibility for listing in the California Register of Historical Resources (CRHR) of any cultural resources that are newly discovered or that may be affected in an unanticipated manner.

No construction-related ground disturbance or grading, boring, and trenching, as defined in the Compliance Conditions for this project; post-certification cultural resource activities (as defined in the first paragraph of this condition); or site preparation or subsurface soil work during pre-construction activities or site mobilization, shall occur prior to CPM approval of the CRS and alternates, unless such activities are specifically approved by the CPM.

Approval of a CRS may be denied or revoked for reasons including, but not limited to, non-compliance on this or other Energy Commission projects and for concurrent service as CRS on an unmanageable number of Energy Commission projects, as determined by the CPM. After all ground disturbances is completed and the CRS has fulfilled all responsibilities specified in these cultural resources conditions, the project owner may discharge the CRS, after receiving approval from the CPM.

The staff-recommended conditions described in this subsection of the FSA shall continue to apply during operation of the proposed power plant.

CULTURAL RESOURCE SPECIALIST

The resumes for the CRS and alternate CRS(s) shall include information demonstrating to the satisfaction of the CPM that their training and backgrounds conform to the U.S. Secretary of the Interior's Professional Qualifications Standards, as published in Title 36, Code of Federal Regulations, part 61. In addition, the CRS and alternate CRS(s) shall have the following qualifications:

1. Qualifications appropriate to the needs of the project, including a background in anthropology, archaeology, history, architectural history, or a related field;

2. At least 10 years of archaeological or historical experience (as appropriate for the project site), with resources mitigation and fieldwork;

3. At least one year of field experience in California; and

4. At least three years of experience in a decision-making capacity on cultural resources projects in California and the appropriate training and experience to knowledgably make recommendations regarding the significance of cultural resources. The resumes of the CRS and alternate CRS shall include the names and telephone numbers of contacts familiar with the work of the CRS/alternate CRS on referenced projects and demonstrate to the satisfaction of the CPM that the CRS/alternate CRS has the appropriate training and experience to implement effectively the Conditions.

CULTURAL RESOURCES MONITORS

CRMs shall have the following qualifications:

1. B.S. or B.A. degree in anthropology, archaeology, historical archaeology, or a related field; and one year of archaeological field experience in California; or

2. A.S. or A.A. degree in anthropology, archaeology, historical archaeology, or a related field, and four years of archaeological field experience in California; or

3. Enrollment in upper division classes pursuing a degree in the fields of anthropology, archaeology, historical archaeology, or a related field, and two years of archaeological field experience in California.

NATIVE AMERICAN MONITORS

The project owner shall ensure that the CRS obtains the services of qualified NAMs. Preference in selecting NAMs shall be given to Native Americans with:

1. traditional ties to the area to be monitored, and

2. the highest qualifications as described by the Native American Heritage Commission (NAHC) document entitled: *Guidelines for Monitors/Consultants of Native American Cultural, Religious, and Burial Sites* (NAHC 2005).

CULTURAL RESOURCES TECHNICAL SPECIALISTS

The resume(s) of any additional technical specialist(s), e.g., geoarchaeologist, historical archaeologist, historian, architectural historian, and/or physical anthropologist, shall be submitted to the CPM for approval. The resume of each proposed specialist shall demonstrate that their training and background meet the U.S. Secretary of Interior's Professional Qualifications Standards for their specialty (if appropriate), as published in Title 36, Code of Federal Regulations, part 61, and show the completion of appropriate graduate-level coursework. The resumes of specialists shall include the names and telephone numbers of contacts familiar with the work of these persons on projects referenced in the resumes and demonstrate to the satisfaction of the CPM that these persons have the appropriate training and experience to undertake the required research. The project owner may name and hire any specialist prior to certification. All specialists are under the supervision of the CRS.

Verification:

1. At least 45 days prior to the start of construction-related ground disturbance, the project owner shall submit the resume for the CRS and alternate CRS(s) (if proposed), to the CPM for review and approval.

2. At least 10 days prior to a termination or release of the CRS, or within 10 days after the resignation of a CRS, the project owner shall submit the resume of the proposed new CRS to the CPM for review and approval. If there is no alternate CRS in place to conduct the duties of the CRS, a previously approved CRM may serve in place of a CRS so that construction-related ground disturbance may continue up to a maximum of three days without a CRS. If cultural resources are discovered, construction-related ground disturbance will remain halted until there is a CRS or alternate CRS to make a recommendation regarding significance.

3. At least 20 days prior to construction-related ground disturbance, the CRS shall provide a letter naming anticipated CRMs, NAMs, and additional specialists, for the project. The letter shall state that the identified monitors and specialists meet the minimum qualifications for cultural resources monitoring and resource management required by this condition.

4. If efforts to obtain the services of a qualified NAM are unsuccessful, the project owner shall inform the CPM of this situation in writing at least 30 days prior to the beginning of post-certification cultural resources field work or construction-related ground disturbance.

5. At least 5 days prior to additional CRMs or NAMs beginning on-site duties during the project, the CRS shall review the qualifications of the proposed CRMs or NAMs and send approval letters to the CPM, identifying the monitors and attesting to their qualifications.

6. At least 10 days prior to any technical specialists beginning tasks, the resume(s) of the specialists shall be provided to the CPM for review and approval.

7. At least 10 days prior to the start of construction-related ground disturbance, the project owner shall confirm in writing to the CPM that the approved CRS will be available for onsite work and is prepared to implement the cultural resources conditions.

CUL-2 Prior to the start of construction-related ground disturbance or site preparation, boring, and trenching, as defined in the Compliance Conditions for this project; or surface grading or subsurface soil work during pre-construction activities or site mobilization; if the CRS has not previously worked on the project, the project owner shall provide the CRS with copies of the AFC, data responses, confidential cultural resources reports, all supplements, the Energy Commission staff's cultural resources FSA, and the cultural resources conditions of certification from the Final Decision for the project. The project owner shall also provide the CRS and the CPM with maps and drawings showing the footprints of the power plant, all linear facility routes, all access roads, and all laydown areas. Maps shall include the appropriate USGS quadrangles and a map at an appropriate scale (e.g., 1:24,000 and 1 inch = 200 feet, respectively) for plotting cultural features or materials. If the CRS requests enlargements or strip maps for linear facility routes, the project owner shall provide copies to the CRS and CPM. The CPM shall review map submittals and, in consultation with the CRS, approve those that are appropriate for use in cultural resources planning activities. No ground disturbance shall occur prior to CPM approval of maps and drawings, unless such activities are specifically approved by the CPM.

Maps shall include any NRHP/CRHR-eligible historic built environment resources identified in the FSA.

If construction of the project would proceed in phases, maps and drawings not previously provided shall be provided to the CRS and CPM prior to the start of each phase. Written notice identifying the proposed schedule of each project phase shall be provided to the CRS and CPM.

Weekly, until ground disturbance is completed, the project construction manager shall provide to the CRS and CPM a schedule of project activities for the following week, including the identification of area(s) where ground disturbance will occur during that week.

The project owner shall notify the CRS and CPM of any changes to the scheduling of the construction phases.

The project owner shall provide the documents described in the first paragraph of this condition to new CRSs in the event that the approved CRS is terminated or resigns.

Verification:

1. At least 40 days prior to the start of ground disturbance, the project owner shall provide the CPM notice that the AFC, data responses, confidential cultural resources documents, all supplements, FSA, and Final Commission Decision have been provided to the CRS, if needed, and the subject maps and drawings to the CRS and CPM. The CPM will review submittals in consultation with the CRS and approve maps and drawings suitable for cultural resources planning activities.

2. At least 15 days prior to the start of ground disturbance, if there are changes to any project-related footprint, the project owner shall provide revised maps and drawings for the changes to the CRS and CPM.

3. At least 15 days prior to the start of each phase of a phased project, the project owner shall submit the appropriate maps and drawings, if not previously provided, to the CRS and CPM.

4. Weekly, during ground disturbance, a schedule of the next week’s anticipated project activity shall be provided to the CRS and CPM by letter, e-mail, or fax.

5. Monthly, during ground disturbance, email progress report to the CPM, interested Native Americans and other interested parties.

6. Within 5 days of changing the scheduling of phases of a phased project, the project owner shall provide written notice of the changes to the CRS and CPM.

7. At least 10 days prior to a termination or release of the CRS, or within 10 days after the resignation of a CRS, the project owner shall provide the CPM notice that the AFC, data responses, confidential cultural resources documents, all supplements, FSA, Final Commission Decision, and maps and drawings have been provided to the new CRS.

CUL-3 Prior to the start of construction-related ground disturbance or grading, boring, and trenching, as defined in the Compliance Conditions for this project; or surface grading or subsurface soil work during pre-construction activities or site mobilization; the project owner shall submit the Cultural Resources Mitigation and Monitoring Plan (CRMMP), as prepared by or under the direction of the CRS, to the CPM for review and approval. The CRMMP shall follow the content and organization of the draft model CRMMP, provided by the CPM, and the authors' name(s) shall appear on the title page of the CRMMP. The CRMMP shall identify measures to minimize potential impacts to sensitive cultural resources. Implementation of the CRMMP shall be the responsibility of the CRS and the project owner. Copies of the CRMMP shall reside with the CRS, alternate CRS, each CRM, and the project owner's on-site construction manager. No ground disturbance shall occur prior to CPM approval of the CRMMP, unless such activities are specifically approved by the CPM. The CRMMP shall be designated as a confidential document if the location(s) of cultural resources are described or mapped.

The CRMMP shall include, but not be limited to, the following elements and measures:

1. The following statement included in the Introduction: "Any discussion, summary, or paraphrasing of the conditions of certification in this CRMMP is intended as general guidance and as an aid to the user in understanding the conditions and their implementation. The conditions, as written in the Commission Decision, shall supersede any summarization, description, or interpretation of the conditions in the CRMMP. The Cultural Resources conditions of certification from the Commission Decision are contained in Appendix A."

2. A proposed general research design that includes a discussion of archaeological research questions and testable hypotheses specifically applicable to the project area, and a discussion of artifact collection, retention/disposal, and curation policies as related to the research questions formulated in the research design. The research design shall specify that the preferred treatment strategy for any buried archaeological deposits is avoidance. A specific mitigation plan shall be prepared for any unavoidable impacts to any CRHR-eligible (as determined by the CPM) resources. A prescriptive treatment plan may be included in the CRMMP for limited data types.

3. Specification of the implementation sequence and the estimated time frames needed to accomplish all project-related tasks during the ground-disturbance and post-ground–disturbance 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 description of the manner in which Native American observers or monitors will be included, the procedures to be used to select them, and their role and responsibilities.

6. A description of all impact-avoidance measures (such as flagging or fencing) to prohibit or otherwise restrict access to sensitive resource areas that are to be avoided during ground disturbance, construction, and/or operation, and identification of areas where these measures are to be implemented. The description shall address how these measures would be implemented prior to the start of ground disturbance and how long they would be needed to protect the resources from project-related effects.

7. A statement that all encountered cultural resources over 50 years old shall be recorded on DPR 523 forms and mapped and photographed. In addition, all archaeological materials retained as a result of the archaeological investigations (survey, testing, data recovery) shall be curated in accordance with the California State Historical Resources Commission's (SHRC) *Guidelines for the Curation of Archaeological Collections* (SHRC 1993), into a retrievable storage collection in a public repository or museum.

8. A statement that the project owner will pay all curation fees for artifacts recovered and for related documentation produced during cultural resources investigations conducted for the project. The project owner shall identify three possible curation facilities that could accept cultural resources materials resulting from project activities.

9. A statement demonstrating when and how the project owner will comply with Health and Human Safety Code, section 7050.5(b) and Public Resources Code, section 5097.98(b) and (e), including the statement that the project owner will notify the CPM and the NAHC of the discovery of human remains.

10. A statement that the CRS has access to equipment and supplies necessary for site mapping, photography, and recovery of any cultural resource materials that are encountered during ground disturbance and cannot be treated prescriptively.

11. A description of the contents, format, and review and approval process of the final cultural resources report (CRR), which shall be prepared according to *Archaeological Resource Management Report* (ARMR) guidelines.

<u>Verification:</u>

1. Upon approval of the CRS proposed by the project owner, the CPM will provide to the project owner an electronic copy of the draft model CRMMP for the CRS.

2. At least 30 days prior to the start of ground disturbance, the project owner shall submit the CRMMP to the CPM for review and approval.

3. At least 30 days prior to the start of ground disturbance, in a letter to the CPM, the project owner shall agree to pay curation fees for any materials generated or collected as a result of the archaeological investigations (survey, testing, and data recovery).

4. Within 90 days after completion of ground disturbance (including landscaping), if cultural materials requiring curation were generated or collected, the project owner shall provide to the CPM a copy of an agreement with, or other written commitment from a curation facility that meets the standards stated in SHRC (1993), to accept the cultural materials from this project. Any agreements concerning curation will be retained and available for audit for the life of the project.

CUL-4 The project owner shall submit the final cultural resources report (CRR) to the CPM for approval. The final CRR shall be written by, or under the direction of, the CRS and shall be provided in the ARMR format. The final CRR shall report on all field activities including dates, times and locations, results, samplings, and analyses. The final CRR shall be a confidential document if it describes or maps the location(s) of cultural resources. All survey reports, DPR 523 forms, data recovery reports, and any additional research reports not previously submitted to the California Historical Resources Information System (CHRIS) shall be included as appendices to the final CRR.

If the project owner requests a suspension of ground disturbance and/or construction activities, then a draft CRR that covers all cultural resources activities associated with the project shall be prepared by the CRS and submitted to the CPM for review and approval. The draft CRR shall be retained at the project site in a secure facility until ground disturbance and/or construction resumes or the project is withdrawn. If the project is withdrawn, then a final CRR shall be submitted to the CPM for review and approval.

<u>Verification:</u>

1. Within 30 days after requesting a suspension of construction activities, the project owner shall submit a draft CRR to the CPM for review and approval.

2. Within 90 days after completion of ground disturbance (including landscaping), the project owner shall submit the final CRR to the CPM for review and approval. If any reports have previously been sent to the CHRIS, then receipt letters from the CHRIS or other verification of receipt shall be included in an appendix.

3. Within 10 days after CPM approval of the CRR, the project owner shall provide documentation to the CPM confirming that copies of the final CRR have been provided to the State Historic Preservation Officer, the CHRIS, the curating institution, if archaeological materials were collected, and to the tribal chairpersons of any Native American groups requesting copies of project-related reports.

CUL-5 Prior to and for the duration of construction-related ground disturbance or grading, boring, and trenching, as defined in the Compliance Conditions for this project; or surface grading or subsurface soil work during pre-construction activities or site mobilization; the project owner shall provide Worker Environmental Awareness Program (WEAP) training to all new workers within their first week of employment at the project site, along the linear facilities routes, and at laydown areas, roads, and other ancillary areas. The cultural resources part of this training shall be prepared by the CRS, may be conducted by any member of the archaeological team, and may be presented in the form of a video. The CRS is encouraged to include a Native American presenter in the training to contribute the Native American perspective on archaeological and ethnographic resources. During the training and during construction, the CRS shall be available (by telephone or in person) to answer questions posed by employees. The training may be discontinued when ground disturbance is completed or suspended, but must be resumed when ground disturbance, such as landscaping, resumes.

The training shall include:

1. A discussion of applicable laws and penalties under law;
2. Samples or visuals of artifacts that might be found in the project vicinity;
3. A discussion of what such artifacts may look like when partially buried, or wholly buried and then freshly exposed;
4. A discussion of what prehistoric and historical archaeological deposits look like at the surface and when exposed during construction, and the range of variation in the appearance of such deposits;
5. Instruction that the CRS, alternate CRS, and CRMs have the authority to halt ground disturbance in the area of a discovery to an extent sufficient to ensure that the resource is protected from further impacts, as determined by the CRS;
6. Instruction that employees, if the CRS, alternate CRS, or CRMs are not present, are to halt work on their own in the vicinity of a potential cultural resources discovery, and shall contact their supervisor and the CRS or CRM, and that redirection of work would be determined by the construction supervisor and the CRS;
7. An informational brochure that identifies reporting procedures in the event of a discovery;
8. An acknowledgement form signed by each worker indicating that they have received the training; and
9. A sticker that shall be placed on hard hats indicating that environmental training has been completed.

No ground disturbance shall occur prior to implementation of the WEAP program, unless such activities are specifically approved by the CPM.

Verification:

1. At least 30 days prior to the beginning of ground disturbance, the CRS shall provide the cultural resources WEAP training program draft text and/or training video, including Native American participation, and graphics and the informational brochure to the CPM for review and approval.

2. At least 15 days prior to the beginning of ground disturbance, the CPM will provide to the project owner a WEAP Training Acknowledgement form for each WEAP-trained worker to sign.

3. Monthly, until ground disturbance is completed, the project owner shall provide in the Monthly Compliance Report (MCR) the WEAP Training Acknowledgement forms of workers who have completed the training in the prior month and a running total of all persons who have completed training to date.

CUL-6 Prior to the start of construction-related ground disturbance or grading, boring, and trenching, as defined in the Compliance Conditions for this project; or surface grading or subsurface soil work during pre-construction activities or site mobilization; the project owner shall notify the CPM and all interested Native Americans of the date on which ground disturbance will ensue. The project owner shall ensure that the CRS, alternate CRS, or CRMs monitor full time the following project components to ensure there are no impacts to undiscovered cultural resources.

- Block 1 STG foundation
- Block 1, two generator step-up transformers west of gas compression building
- Block 1 gas compression building foundation
- Block 2 CCGT/HRSG foundation slab
- Block 2, two easternmost transformer foundations
- Block 2 STG foundation
- Block 2 ACC pile caps
- Relocated gas metering station
- Ammonia tank spill containment basin
- Ammonia tank refilling station
- Perimeter grounding cable
- Grounding rods

Full-time archaeological monitoring for this project shall be required during the ground-disturbing activities (as specified in the list immediately above), for as long as the activities are ongoing. The project owner is not required to monitor construction of other project components (that is, those not listed immediately above) unless the CRS or CPM determine that observable conditions in the field warrant monitoring. Where excavation equipment is actively removing dirt and hauling the excavated material farther than 50 feet from the location of active excavation, full-time archaeological monitoring shall require at least two monitors per excavation area. In this circumstance, one monitor shall observe the location of active excavation and a second monitor shall inspect the dumped material. For excavation areas where the excavated material is dumped no farther than 50 feet from the location of active excavation, one monitor shall both observe the location of active excavation and inspect the dumped material.

In the event that the CRS believes that the required number of monitors is not appropriate in certain locations, a letter or e-mail detailing the justification for changing the number of monitors shall be provided to the CPM for review and approval prior to any change in the number of monitors.

The project owner shall obtain the services of one or more NAMs to monitor construction-related ground disturbance in areas where Native American artifacts may be discovered. Contact lists of interested Native Americans and guidelines for monitoring shall be obtained from the NAHC. Preference in selecting an NAM shall be given to Native Americans with traditional ties to the area that shall be monitored. If efforts to obtain the services of a qualified NAM are unsuccessful, the project owner shall immediately inform the CPM. The CPM will either identify potential monitors or will allow construction-related ground disturbance to proceed without an NAM.

The research design in the CRMMP shall govern the collection, treatment, retention/disposal, and curation of any archaeological materials encountered. On forms provided by the CPM, CRMs shall keep a daily log of any monitoring and other cultural resources activities and any instances of non-compliance with the conditions and/or applicable LORS. The daily monitoring logs shall at a minimum include the following:

- First and last name of the CRM and any accompanying NAM.
- Time in and out.
- Weather. Specify if weather conditions led to work stoppages.
- Work location (project component). Provide specifics—.e.g., power block, landscaping.
- Proximity to site location. Specify if work conducted within 1000 feet of a known cultural resource.
- Work type (machine).
- Work crew (company, operator, foreman).

- Depth of excavation.
- Description of work.
- Stratigraphy.
- Artifacts, listed with the following identifying features:
  - Field artifact #: When recording artifacts in the daily monitoring logs, the CRS shall institute a field numbering system to reduce the likelihood of repeat artifact numbers. A typical numbering system could include a project abbreviation, monitor's initials, and a set of numbers given to that monitor: e.g., HBEP-MB-123.
  - Description.
  - Measurements.
  - Universal Transverse Mercator coordinates.
- Whether artifacts are likely to be isolates or components of larger resources.
- Assessment of significance of any finds.
- Actions taken.
- Plan for the next work day.

A cover sheet shall be submitted with each day's monitoring logs, and shall at a minimum include the following:

- Count and list of first and last names of all CRMs and of all NAMs for that day.
- General description (in paragraph form) of that day's overall monitoring efforts, including monitor names and locations.
- Any reasons for halting work that day.
- Count and list of all artifacts found that day: include artifact #, location (i.e., grading in Unit X), measurements, UTMs, and very brief description (i.e., historic can, granitic biface, quartzite flake).
- Whether any artifacts were found out of context (i.e., in fill, caisson drilling, flood debris, spoils pile).

Copies of the daily monitoring logs and cover sheets shall be provided by email from the CRS to the CPM, as follows:

- Each day's monitoring logs and cover sheet shall be merged into one PDF document
- The PDF title and headings, and emails shall clearly indicate the date of the applicable monitoring logs.
- PDFs for any revised or resubmitted versions shall use the word "revised" in the title.

Daily and/or weekly maps shall be submitted along with the monitoring logs as follows:

- The CRS shall provide daily and/or weekly maps of artifacts at the request of the CPM. A map shall also be provided if artifact locations show complexity, high density, or other unique considerations.

- Maps shall include labeled artifacts, project boundaries, previously recorded sites and isolates, aerial imagery background, and appropriate scales.

From the daily monitoring logs, the CRS shall compile a monthly monitoring summary report to be included in the MCR. If there are no monitoring activities, the summary report shall specify why monitoring has been suspended.

- The Cultural Resources section of the MCR shall be prepared in coordination with the CRS, and shall include a monthly summary report of cultural resources-related monitoring. The summary shall:
  - List the number of CRMs and NAMs on a daily basis, as well as provide monthly monitoring-day totals.
  - Give an overview of cultural resource monitoring work for that month, and discuss any issues that arose.
  - Describe fulfillment of requirements of each cultural mitigation measure.
  - Summarize the confidential appendix to the MCR, without disclosing any specific confidential details.
  - Include the artifact concordance table (as discussed under the next bullet point), but with removal of UTMs.
- Each MCR, prepared under supervision of the CRS, shall be accompanied by a confidential appendix that contains completed DPR 523A forms for all artifacts recorded or collected in that month. For any artifact without a corresponding DPR form, the CRS shall specify why the DPR form is not applicable or pending (i.e. as part of a larger site update).
  - A concordance table that matches field artifact numbers with the artifact numbers used in the DPR forms shall be included. The sortable table shall contain each artifact's date of collection and UTM numbers, and note if an artifact has been deaccessioned or otherwise does not have a corresponding DPR form. Any post-field log recordation changes to artifact numbers shall also be noted.
  - DPR forms shall be submitted as one combined PDF.
    - The PDF shall organize DPR forms by site and/or artifact number.
    - The PDF shall include an index and bookmarks.

- If artifacts from a given site location (in close proximity of each other or an existing site) are collected month after month, and if agreed upon with the CPM, a final updated DPR for the site may be submitted at the completion of monitoring. The monthly concordance table shall note that the DPR form for the included artifacts is pending.

The CRS or alternate CRS shall report daily to the CPM on the status of the project's cultural resources-related activities, unless reducing or ending daily reporting is requested by the CRS and approved by the CPM.

In the event that the CRS believes that the current level of monitoring is not appropriate in certain locations, a letter or e-mail detailing the justification for changing the level of monitoring shall be provided to the CPM for review and approval prior to any change in the level of monitoring.

The CRS, at his or her discretion, or at the request of the CPM, may informally discuss cultural resources monitoring and mitigation activities with Energy Commission technical staff.

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.

Upon becoming aware of any incidents of non-compliance with the Conditions and/or applicable LORS, the CRS and/or the project owner shall notify the CPM. The CRS shall also recommend corrective action to resolve the problem or achieve compliance with the Conditions. When the issue is resolved, the CRS shall write a report describing the issue, the resolution of the issue, and the effectiveness of the resolution measures. This report shall be provided in the next MCR for the review of the CPM.

Verification:

1. At least 30 days prior to the start of ground disturbance, the project owner will notify all Native Americans with whom Energy Commission staff communicated during the project review of the date on which the project's ground disturbance will begin.

2. At least 30 days prior to the start of ground disturbance, the CPM will provide to the CRS an electronic copy of a form to be used as a daily monitoring log and information to be included in the cover sheet for the daily monitoring logs

3. While monitoring is on-going, the project owner shall submit each day's monitoring logs and cover sheet merged into one PDF document by email within 24 hours.

4. The CRS and/or project owner shall notify the CPM of any incidents of non-compliance with the Conditions and/or applicable LORS by telephone or email within 24 hours

5. The CRS shall provide daily maps of artifacts along with the daily monitoring logs if more than 10 artifacts are found per day, or as requested by the CPM.

6. The CRS shall provide weekly maps of artifacts if there more than 50 artifacts are found per week, or as requested by the CPM. The map shall be submitted within two business days after the end of each week.

7. Within 15 days of receiving from a local Native American group a request that a NAM be employed, the project owner shall submit a copy of the request and a copy of a response letter to the group notifying them that a NAM has been employed and identifying the NAM.

8. While monitoring is on-going, the project owner shall submit monthly MCRs and accompanying weekly summary reports. The project owner shall attach any new DPR 523A forms, under confidential cover, completed for finds treated prescriptively, as specified in the CRMMP.

9. Final updated DPRs with sites (where artifacts are collected month after month) can be submitted at the completion of monitoring, as agreed upon with the CPM.

10. At least 24 hours prior to implementing a proposed change in monitoring level, the project owner shall submit to the CPM, for review and approval, a letter or e-mail (or some other form of communication acceptable to the CPM) detailing the CRS's justification for changing the monitoring level.

11. At least 24 hours prior to reducing or ending daily reporting, the project owner shall submit to the CPM, for review and approval, a letter or e-mail (or some other form of communication acceptable to the CPM) detailing the CRS's justification for reducing or ending daily reporting.

12. Within 15 days of receiving them, the project owner shall submit to the CPM copies of any comments or information provided by Native Americans in response to the project owner's transmittals of information.

CUL-7 The project owner shall grant authority to halt ground disturbance to the CRS, alternate CRS, and the CRMs in the event of a discovery. Redirection of ground disturbance shall be accomplished under the direction of the construction supervisor in consultation with the CRS.

In the event that a cultural resource over 50 years of age is found (or if younger, determined exceptionally significant by the CPM), or impacts to such a resource can be anticipated, ground disturbance shall be halted or redirected in the immediate vicinity of the discovery sufficient to ensure that the resource is protected from further impacts. If the discovery includes human remains, the project owner shall comply with the requirements of Health and Human Safety Code, section 7050.5(b) and notify the CPM and the NAHC of the discovery of human remains. No action with respect to the disposition of human remains of Native American origin shall be initiated without direction from the CPM. Monitoring, including Native American monitoring, and daily reporting, as provided in other conditions, shall continue during the project's ground-disturbing activities on other areas of the project site, while the halting or redirection of ground disturbance in the vicinity of the discovery shall remain in effect until the CRS has visited the discovery, and 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 discovery, or by Monday morning if the cultural resources discovery occurs between 8:00 AM on Friday and 8:00 AM on Sunday, and provided a description of the discovery (or changes in character or attributes), the action taken (i.e., work stoppage or redirection), a recommendation of CRHR/NRHP eligibility, and recommendations for data recovery from any cultural resources discoveries, whether or not a determination of CRHR/NRHP eligibility has been made.

2. If the discovery would be of interest to Native Americans, the CRS has notified all Native American groups that expressed a desire to be notified in the event of such a discovery.

3. The CRS has completed field notes, measurements, and photography for a DPR 523 "Primary Record" form. Unless the find can be treated prescriptively, as specified in the CRMMP, the "Description" entry of the DPR 523 "Primary Record" form shall include a recommendation on the CRHR/NRHP eligibility of the discovery. The project owner shall submit completed forms to the CPM.

4. The CRS, the project owner, and the CPM have conferred, and the CPM has concurred with the recommended eligibility of the discovery and approved the CRS's proposed data recovery, if any, including the curation of the artifacts, or other appropriate mitigation; and any necessary data recovery and mitigation have been completed.

Ground disturbance may resume only with the approval of the CPM.

Verification:

1. At least 30 days prior to the start of ground disturbance, the project owner shall provide the CPM and CRS with a letter confirming that the CRS, alternate CRS, and CRMs have the authority to halt ground disturbance in the vicinity of a cultural resources discovery, and that the project owner shall ensure that the CRS notifies the CPM within 24 hours of a discovery, or by Monday morning if the cultural resources discovery occurs between 8:00 AM on Friday and 8:00 AM on Sunday.

2. Unless the discovery can be treated prescriptively, as specified in the CRMMP, completed DPR 523 forms for resources newly discovered during ground disturbance shall be submitted to the CPM for review and approval no later than 24 hours following the notification of the CPM, or 48 hours following the completion of data recordation/recovery, whichever the CRS decides is more appropriate for the subject cultural resource.

3. Within 48 hours of the discovery of a resource of interest to Native Americans, the project owner shall ensure that the CRS notifies all Native American groups that expressed a desire to be notified in the event of such a discovery, and the CRS must inform the CPM when the notifications are complete.

4. No later than 30 days following the discovery of any Native American cultural materials, the project owner shall submit to the CPM copies of the information transmittal letters sent to the chairpersons of the Native American tribes or groups who requested the information. Additionally, the project owner shall submit to the CPM copies of letters of transmittal for all subsequent responses to Native American requests for notification, consultation, and reports and records.

5. Within 15 days of receiving them, the project owner shall submit to the CPM copies of any comments or information provided by Native Americans in response to the project owner's transmittals of information.

CUL-8 If fill soils must be acquired from a non-commercial borrow site or disposed of to a non-commercial disposal site, unless less-than-five-year-old surveys of these sites for archaeological resources are provided to and approved by the CPM, the CRS shall survey the borrow or disposal site(s) for cultural resources and record on DPR 523 forms any that are identified. When the survey is completed, the CRS shall convey the results and recommendations for further action to the project owner and the CPM, who will determine what, if any, further action is required. If the CPM determines that significant archaeological resources that cannot be avoided are present at the borrow site, the project owner must either select another borrow or disposal site or implement **CUL-7** prior to any use of the site. The CRS shall report on the methods and results of these surveys in the final CRR.

Verification:

1. As soon as the project owner knows that a non-commercial borrow site and/or disposal site will be used, he/she shall notify the CRS and CPM and provide documentation of previous archaeological survey, if any, dating within the past five years, for CPM approval.

2. In the absence of documentation of recent archaeological survey, at least 30 days prior to any soil borrow or disposal activities on the non-commercial borrow and/or disposal sites, the CRS shall survey the site(s) for archaeological resources. The CRS shall notify the project owner and the CPM of the results of the cultural resources survey, with recommendations, if any, for further action.

CULTURAL RESOURCES ACRONYM GLOSSARY

ac	acre(s)
ACC	air-cooled condenser
AFC	Application for Certification
ARMR	Archaeological Resource Management Report
asl	above sea level
AST	aboveground storage tank
Ave	Avenue
Blvd	Boulevard
B.P.	before present
CA	California [state]
Cal. Code Regulations	California Code of Regulations
CCC	California Coastal Commission
CCGT	combined cycle gas turbine
CEQA	California Environmental Quality Act
CHRIS	California Historical Resources Information System
COE	Corps of Engineers, U.S. Army
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	Department of Parks and Recreation

DPR 523	Department of Parks and Recreation cultural resources recordation form
Dr	Drive
EIR	Environmental impact report
° F	degrees Fahrenheit
FSA	Final Staff Assessment
ft	foot/feet
GLO	General Land Office
HB	Huntington Beach
HBEP	Huntington Beach Energy Project
HBGS	Huntington Beach Generating Station
HRB	Historic Resources Board [of City of Huntington Beach]
HRSG	heat recovery steam generator
LA	Los Angeles [County]
LADWP	Los Angeles Department of Water and Power
LAN	Los Angeles [County]
LORS	laws, ordinances, regulations, and standards
LTS	less-than-significant [impact]
LTSWM	less-than-significant [impact] with mitigation
MCR	Monthly Compliance Report
mi	miles
MLD	Most Likely Descendent
NAHC	Native American Heritage Commission
NAM	Native American Monitor
n.d.	no date
NPS	National Park Service
NRHP	National Register of Historic Places

OCA	Orange County Archives
OCFCD	Orange County Flood Control District
OCHS	Orange County Historical Society
OCSD	Orange County Sanitation District
OHP	Office of Historic Preservation
OR	Orange [County]
ORA	Orange [County]
PAA	Project Area of Analysis
PCH	Pacific Coast Highway (State Route 1)
Pkwy	Parkway
PS	potentially significant [impact]
Pub. Resources Code	[State of California] Public Resources Code
Rd	Road
SCCIC	South Central Coastal Information Center
SCEC	Southern California Edison Company
SCR	selective catalytic reduction (unit)
sf	square feet
SHRC	State Historical Resources Commission
SST	sea surface temperature
St	Street
Staff	Energy Commission cultural resources staff
STG	steam turbine generator
SU	significant and unavoidable [impact]
USC	University of Southern California
USGS	U.S. Geological Survey

WEAP	Worker Environmental Awareness Program
WPLT	Western Pluvial Lake Tradition
WTP	water treatment plant

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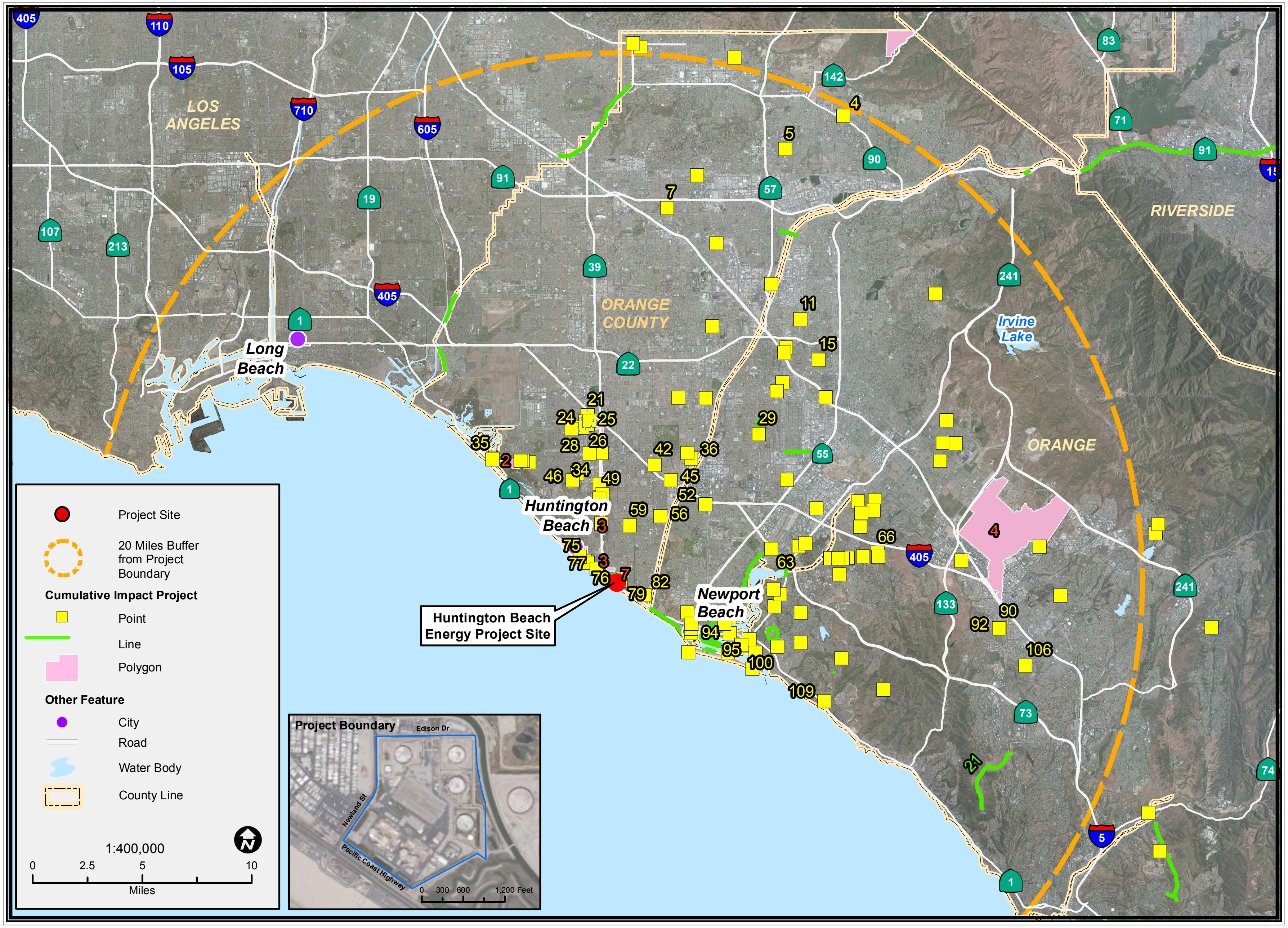
CULTURAL RESOURCES - FIGURE 1

Huntington Beach Energy Project - Cumulative Projects



CULTURAL RESOURCES

CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCE: BLM, ESRI, Tele Atlas, Bing Aerial Image

HAZARDOUS MATERIALS MANAGEMENT

Testimony of Geoff Lesh, P.E.

SUMMARY OF CONCLUSIONS

Staff's evaluation of the proposed Huntington Beach Energy Project (HBEP), along with staff's proposed mitigation measures, indicates that hazardous materials use at the site would not present a significant impact to the public. With adoption of the proposed conditions of certification, the proposed project will comply with all applicable laws, ordinances, regulations, and standards. In response to Health and Safety Code, section 25531 et seq., AES Southland Development, LLC (AES-SLD) (the applicant) would be required to develop a risk management plan. To ensure the adequacy of this plan, staff's proposed conditions of certification require that the risk management plan be submitted for concurrent review by the Huntington Beach Fire Department (HBFD) and Energy Commission staff. In addition, staff's proposed conditions of certification require that both the HBFD and staff review and approve the risk management plan prior to delivery of any hazardous materials to the HBEP project site. Other proposed conditions of certification address the issue of the transportation, storage, and use of aqueous ammonia and site security.

INTRODUCTION

The purpose of this hazardous materials management analysis is to determine if the proposed HBEP has the potential to cause significant impacts on the public as a result of the use, handling, storage, or transportation of hazardous materials at the proposed site. If significant adverse impacts on the public are identified, Energy Commission staff must also evaluate the potential for facility design alternatives and additional mitigation measures to reduce 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.

Aqueous ammonia (19 percent ammonia in aqueous solution) will be used to control oxides of nitrogen (NOx) emissions through selective catalytic reduction. The use of aqueous ammonia significantly reduces the risk that would otherwise be associated with the use of the more hazardous anhydrous form of ammonia. Use of the aqueous form eliminates the high internal energy associated with the anhydrous form, which is stored as a liquefied gas at high pressure. The high internal energy associated with the anhydrous form of ammonia can act as a driving force in an accidental release, which can rapidly introduce large quantities of the material to the ambient air and result in high down-wind concentrations. Spills associated with the aqueous form are much easier to contain than those associated with anhydrous ammonia, and emissions from such spills are limited by the slow mass transfer from the surface of the spilled material.

Other hazardous materials, such as mineral and lubricating oils, cleaning detergents, and welding gasses will be present at the proposed HBEP project. No acutely toxic hazardous materials will be used on site during 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. Handling of hazardous materials during construction would follow Best Management Practices (BMPs) to minimize environmental effects (HBEP 2012a, Sections 5.5.3 and 5.5.4).

Although no natural gas is stored, the project will also involve the handling of large amounts of natural gas. Natural gas poses some risk of both fire and explosion. The proposed HBEP would connect to an existing Southern California Gas Company (SoCalGas) high-pressure natural gas pipeline located onsite on the northwest side of the facility near Newland Road (HBEP 2012a, Section 5.5.6.2.6). The HBEP project would also require the transportation of aqueous ammonia to the facility. This document addresses all potential impacts associated with the use and handling of hazardous materials.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

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

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 (also known as SARA Title III).
The Clean Air Act (CAA) of 1990 (42 USC 7401 et seq. as amended)	Established a nationwide emergency planning and response program and imposed reporting requirements for businesses that store, handle, or produce significant quantities of extremely hazardous materials.
The CAA section on risk management plans (42 USC §112(r)	Requires states to implement a comprehensive system informing local agencies and the public when a significant quantity of such materials is stored or handled at a facility. The requirements of both SARA Title III and the CAA are reflected in the California Health and Safety Code, section 25531, et seq.
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.
Title 49, Code of Federal Regulations, Part 190	Outlines gas pipeline safety program procedures.

Applicable LORS	Description
Title 49, Code of Federal Regulations, Part 191	Addresses transportation of natural and other gas by pipeline: annual reports, incident reports, and safety-related condition reports. Requires operators of pipeline systems to notify the DOT of any reportable incident by telephone and then submit a written report within 30 days.
Title 49, Code of Federal Regulations, Part 192	Addresses transportation of natural and other gas by pipeline and minimum federal safety standards, specifies minimum safety requirements for pipelines including material selection, design requirements, and corrosion protection. The safety requirements for pipeline construction vary according to the population density and land use that characterize the surrounding land. This part also contains regulations governing pipeline construction (which must be followed for Class 2 and Class 3 pipelines) and the requirements for preparing a pipeline integrity management program.
Federal Register (6 CFR Part 27) interim final rule	A regulation of the U.S. Department of Homeland Security that requires 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 facility 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 Risk Management Plan (RMP) process.
Title 8, California Code of Regulations, section 458 and sections 500 to 515	Sets forth requirements for the design, construction, and operation of vessels and equipment used to store and transfer ammonia. These sections generally codify the requirements of several industry codes, including the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, the American National Standards Institute (ANSI) K61.1 and the National Boiler and Pressure Vessel Inspection Code. These codes apply to anhydrous ammonia but are also used to design storage facilities for aqueous ammonia.
California Health and Safety Code, section 25531 to 25543.4	The California Accidental Release Program (CalARP) requires the preparation of a Risk Management Plan (RMP) and off-site consequence analysis (OCA) and submittal to the local Certified Unified Program Agency for approval.
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.
California Public Utilities Commission General Order 112-E and 58-A	Contains standards for gas piping construction and service.
Local (or locally enforced)	
City of Huntington Beach Municipal Code Section 17.58	Develop and implement safety management plans as required by CA H&SC Sections 25500-25520. Administered by the Huntington Beach Fire Department
Huntington Beach Fire Department City Specifications	Various Huntington Beach Fire Department City Specifications (numbered 401 through 434) may be found at: http://www.huntingtonbeachca.gov/government/departments/Fire/fire_prevention_code_enforcement/fire_dept_city_specifications.cfm

Applicable LORS	Description
City of Huntington Beach Municipal Code, Chapter 17.56	City of Huntington Beach Fire Code: The City of Huntington Beach has adopted the California Fire Code and has adopted several ordinances which amend it. l
NFPA 56 (adopted 2012)	NFPA 56 is the Standard for Fire and Explosion Prevention During Cleaning and Purging of Flammable Gas Piping Systems.

The Huntington Beach Fire Department and OC HCA-EHD share responsibility for the Certified Unified Program Agency (CUPA) programs. The Huntington Beach Fire Department is responsible for administering HMBPs, Hazardous Materials Management Plans, and RMPs filed by businesses located within the city. In addition, the Huntington Beach Fire Department and OC HCA-EHD share responsibility for ensuring that businesses and industry store and use hazardous materials safely and in conformance with various regulatory codes. The OC HCA-EHD is responsible for all other CUPA programs including SPCC Plans. The Huntington Beach Fire Department performs inspections at established facilities to verify that hazardous materials are properly stored and handled and that the types and quantities of materials reported in a firm's HMBP are accurate.(HBEP 2012a, Sections 5.5.6.3) With regard to seismic safety issues, construction and design of buildings and vessels storing hazardous materials will meet the seismic requirements of CCR Title 24 and 2010 California Building Code (HBEP 2012a, Section 5.5.6.4).

SETTING

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 directions are described in the **AIR QUALITY** section (5.1) of the Application for Certification (AFC) (HBEP 2012a). Staff agrees with the applicant's proposed meteorological input assumptions for modeling of potential accidental hazardous material releases that would use the U.S. Environmental Protection Agency's *RMP Offsite Consequence Analysis Guidance* document which assumes environmental conditions of F stability (stagnated air, very little mixing), wind speed of 1.5 meters per second, and the maximum temperature recorded in the area in the last 3 years is appropriate for conducting the off-site consequence analysis (HBEP 2012a, Appendix 5.5A).

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 essentially flat (about 15 feet above sea level) with the Pacific Ocean lying to the south and west and lowlands to the north and east of the project site.

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. Sensitive receptors in the project vicinity are listed and shown in APPENDIX 5.9A (HBEP 2012a). The nearest sensitive receptor is a daycare facility located 0.3 mile east of the project site. The nearest school is the Edison High School, located approximately 0.5 mile to the northeast of the project site (HBEP 2012a, section 5.9.2). All sensitive receptors within six miles of the project site are depicted in figure 5.9A-RECEPTOR MAP – 3275661.1s, (HBEP 2012a, Appendix 5.9A). The nearest resident is approximately 250 feet west-northwest of the facility along Newland Street, and additional residences are located about 1200 feet from the site to the northwest and about 2600 feet from the site to the east, respectively (HBEP 2012a, Section 5.9.2 and Section 2.3, Figure 2.3-3).

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

METHOD AND THRESHOLD FOR DETERMINING SIGNIFICANCE

Staff reviewed and assessed the potential for the transportation, handling, and use of hazardous materials to impact the surrounding community. All chemicals and natural gas 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. In order to accomplish this goal, staff utilized the most current public health exposure levels (both acute and chronic) that are established to protect the public from the effects of an accidental chemical release.

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 applicant 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 applicant plans to store the materials on site.

Staff reviewed the applicant'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 the rules and procedures that workers at the facility must follow that will help to prevent accidents or to keep them small if they do occur. Both engineering and administrative controls can act as methods of prevention or as methods of response and minimization. In both cases, the goal is to prevent a spill from moving off site and causing harm to the public.

Staff reviewed and evaluated the applicant's proposed use of hazardous materials as described by the applicant (HBEP 2012a, Section 5.5). 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 Tables 5.5-1 through 5.5-3 of the AFC and determined the need and appropriateness of their use.
- Step 2: Those chemicals proposed for use in small amounts or whose physical state is such that there is virtually no chance that a spill would migrate off site and impact the public were removed from further assessment.
- Step 3: Measures proposed by the applicant to prevent spills were reviewed and evaluated. These included engineering controls such as automatic shut-off valves and different-sized transfer-hose couplings and administrative controls such as worker training and safety management programs.
- Step 4: Measures proposed by the applicant to respond to accidents were reviewed and evaluated. These measures also included engineering controls such as catchment basins and methods to keep vapors from spreading and administrative controls such as training emergency response crews.
- 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 applicant. When mitigation methods proposed by the applicant 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.

DIRECT/INDIRECT IMPACTS AND MITIGATION

Small Quantity Hazardous Materials

In conducting the analysis, staff determined in Steps 1 and 2 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, the only hazardous materials proposed for use are paint, paint thinner, cleaners, solvents, sealants, gasoline, diesel fuel, motor oil, hydraulic fluid, lubricants, and welding flux. 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, lube oil, mineral insulating oil, and other various chemicals (see **HAZARDOUS MATERIALS APPENDIX B** for a list of all chemicals proposed to be used and stored at HBEP) 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.

After removing from consideration those chemicals that pose no risk of off-site impact in Steps 1 and 2, staff continued with Steps 3, 4, and 5 to review the remaining hazardous materials, natural gas and aqueous ammonia. However, the project will be limited to using, storing, and transporting only those hazardous materials listed in **APPENDIX B** of the PSA as per staff's proposed condition **HAZ-1**.

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% in concentration. Methane is flammable when mixed in air at concentrations of 5-14%, 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 (Lees 1998), 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).

While natural gas will be used in significant quantities, it will not be stored on site. It will be delivered by SoCalGas via the existing onsite gas pipeline that serves the currently operating Huntington Beach Generating Station (HBEP 2012a, Section 4.0). The pipeline and onsite metering station are, and would continue to be, owned and operated by SoCalGas.

The existing SoCalGas metering station will remain in service temporarily during HBEP construction for continued operation of existing Huntington Beach Generating Station Units 1 and 2. As part of HBEP construction, SoCalGas will construct a new onsite gas metering station to support the HBEP facility and will decommission/demolish the existing metering station (HBEP 2012a, Section 4.0). Construction of the new gas metering station is considered part of the overall HBEP and the potential environmental impacts associated with the construction of the new gas metering station are included as part of this analysis of construction impacts.

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 safety management plan proposed by the applicant 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. Additionally, the gas metering station that would be constructed for this project would be located entirely on-site, which greatly reduces the risks of impacts to the public from a rupture or failure.

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 Condition of Certification **HAZ-9** which prohibits the use of flammable gas blows 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 (NO_x) from the combustion of natural gas at the HBEP. The accidental release of aqueous ammonia without proper mitigation can result in significant down-wind concentrations of ammonia gas. HBEP would have 19-percent aqueous ammonia solution in a 24,000-gallon horizontal above ground storage tank (HBEP 2012a, Section 5.5.3.2.2). Actual storage contents would be limited to 20,400 gallons or 85 percent of tank capacity. Based on staff's analysis described above, aqueous ammonia is the only hazardous material that may pose the risk of off-site impact. The use of aqueous ammonia can result in the formation and release of toxic gases in the event of a spill even without interaction with other chemicals. This is a result of its moderate vapor pressure and the large amounts of aqueous ammonia 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 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:

1. the lowest concentration posing a risk of lethality, 2,000 parts per million (ppm);

2. the immediately dangerous to life and health level of 300 ppm;

3. the emergency response planning guideline level 2 of 150 ppm, which is also the RMP level 1 criterion used by US EPA and California; and

4. the level considered by the Energy Commission staff to be without serious adverse effects on the public for a one-time exposure of 75 ppm (considered by staff to be a level of significance).

If the potential exposure associated with a potential release exceeds 75 ppm at any public receptor, staff will assume that the potential release poses a risk of significant impact. However, staff will also 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. A detailed discussion of the exposure criteria considered by staff, as well as their applicability to different populations and exposure-specific conditions, is provided in **HAZARDOUS MATERIALS APPENDIX A**.

Section 5.5.4.3 and APPENDIX 5.5A of the AFC (HBEP 2012a) described the modeling parameters that would be used for the worst-case accidental releases of aqueous ammonia in the applicant's off-site consequence analysis (OCA). Pursuant to the California Accidental Release Program (CalARP) regulations (federal risk management plan regulations do not apply to sources that store or use aqueous ammonia solutions below 20 percent), the OCA would be performed for the worst-case release scenario, which would involve the failure and complete discharge of the storage tank. Ammonia emissions from the potential release scenario would be calculated following methods provided in the RMP off-site consequence analysis guidance, US EPA, April 1999.

Potential off-site ammonia concentrations would be estimated indicating the distance from the source release point to the benchmarks of ammonia concentration.

Staff received applicant's offsite consequence analysis indicating that potential worst-case plume concentrations of more than 75 ppm would not move beyond the site boundaries. Applicant's modeling was performed with the commonly-used SLAB plume modeling program (HBEP 2013ff).

Staff verified applicant's results using a different and more conservative EPA-approved plume modeling program, ALOHA. Staff obtained similar results indicating that given an adequately designed secondary containment structure which limits the exposed surface area of the captured release pool, plume concentrations of more than 75 ppm would not occur off-site, even for the extremely unlikely worst-case scenario.

Staff's proposed Condition of Certification **HAZ-4** ensures that the aqueous ammonia secondary containment structure includes essential design elements to prevent a worst-case spill from producing significant off-site impacts.

Furthermore, the potential for accidents resulting in the release of hazardous materials is greatly reduced through implementation of a safety management program that would include the use of both engineering and administrative controls. Elements of both facility controls and the safety management plan are summarized below.

Engineering Controls

Engineering controls help to prevent accidents and releases (spills) from moving off site and affecting communities by incorporating engineering safety design criteria in the design of the project. The engineered safety features proposed by the applicant for use at the HBEP project include:

- construction of secondary containment areas surrounding each of the hazardous materials storage areas designed to contain accidental releases that might happen during storage or delivery;
- physical separation of stored chemicals in isolated containment areas with a non-combustible partition in order to prevent accidental mixing of incompatible materials, which could result in the evolution and release of toxic gases or fumes;
- installation of a fire protection system for hazardous materials storage areas;
- construction of bermed containment areas surrounding the aqueous ammonia storage tank capable of holding the entire tank volume plus the water associated with a 24-hour period of a 25-year storm;
- construction of a sloped ammonia unloading pad that drains into the storage tank's secondary containment structure; and,
- process protective systems including continuous tank level monitors, automated leak detectors, temperature and pressure monitors, alarms, and emergency block valves.

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 applicant 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.

At the facility, 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.

The applicant will also prepare a risk management plan for aqueous ammonia, as required by both CalARP regulations and Condition of Certification **HAZ-2**. This condition also includes the requirement for a program for the prevention of accidental releases and responses to an accidental release of aqueous ammonia. A hazardous materials business plan will also be prepared by the applicant that would incorporate state requirements for the handling of hazardous materials (HBEP 2012a, Section 5.5.3.2.2). Other administrative controls would be required in proposed Conditions of Certification **HAZ-1** (limitations on the use and storage of hazardous materials and their strength and volume) and **HAZ-3** (development of a safety management plan). Condition of Certification **HAZ-4** requires that the final design drawings for the aqueous ammonia storage (and secondary containment) facility be submitted to the CPM for review and approval.

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 first responders to a hazardous materials incident at HBEP would be from Station #4 of the Huntington Beach Fire Department (HBFD). If needed, a full hazardous materials response would be provided by the HBFD Hazardous Materials Response Team (HBFD-HMRT) located at HBFD Station #6, 18591 Edwards Street, Huntington Beach, CA, approximate 4 miles away. The HBFD-HMRT is capable of handling any hazardous materials-related incident at the proposed facility and would have a response time of 15-to-20 minutes (HBEP 2012a, section 5.5.5.2.1). Staff finds that the HBFD and HBFD-HMRT teams are capable of responding to a hazardous materials emergency call from HBEP.

Transportation of Hazardous Materials

Hazardous materials including aqueous ammonia will be transported to the facility by tanker 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.

Staff reviewed the applicant's proposed transportation route for hazardous materials delivery. Trucks would travel on I-405 to Beach Boulevard (State Highway 39), south onto Pacific Coast Highway (State Highway 1) and left onto Newland Street, then right into the HBEP site (HBEP 2012a, Section 5.5.3.3).

Ammonia can be released during a transportation accident and the extent of impact in the event of such a release would depend upon the location of the accident and the rate of dispersion of ammonia vapor from the surface of the aqueous ammonia pool. The likelihood of an accidental release during transport is dependent upon three factors:

- the skill of the tanker truck driver;
- the type of vehicle used for transport; and,
- accident rates.

To address this concern, staff evaluated the risk of an accidental transportation release in the project area. Staff's analysis focused on the project area after the delivery vehicle leaves the main highway (I-405). 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. See AFC section 5.5 for additional information on regulations governing the transport of hazardous materials.

To address the issue of tanker truck safety, aqueous ammonia will be delivered to the proposed facility in DOT-certified vehicles with design capacities of 6,500 gallons. These vehicles will be designed to DOT Code MC-307. These are high-integrity vehicles designed to haul caustic materials such as ammonia. Staff has, therefore, proposed Condition of Certification **HAZ-5** to ensure that, regardless of which vendor supplies the aqueous ammonia, delivery will be made in a tanker that meets or exceeds the specifications prescribed by these regulations.

To address the issue of accident rates, staff reviewed the technical and scientific literature on hazardous materials transportation (including tanker trucks) accident rates in the United States and California. Staff relied on six references and three federal government databases to assess the risk of a hazardous materials transportation accident.

Staff used the data from the Davies and Lees (1992) article, which references both the 1990 Harwood et al. and 1993 Harwood studies, to determine that the frequency of release for the transportation of hazardous materials in the U.S. is between 0.06 and 0.19 releases per 1,000,000 miles traveled on well-designed roads and highways. The applicant estimated that routine operation of the proposed HBEP would require 10 to 12 ammonia deliveries per month, each delivering about 6,500 gallons (HBEP 2012a, Section 5.5.3.2.2). Each delivery will travel approximately 6.5 miles from I-405 along Beach Boulevard and about 0.5 miles along the Pacific Coast Highway to the facility.

This would result in a maximum of 78 (= 6.5 x 12) miles of delivery tanker truck travel in the project area per month during peak operation (with a full load) and an average of approximately 860 miles of delivery tanker truck travel per year (assuming eleven deliveries per month). Staff believes that the risk over this distance is insignificant. Data from the U.S. DOT show that the actual risk of a fatality over the past five years from all modes of hazardous material transportation (rail, air, boat, and truck) is approximately 0.1 in 1,000,000.

In addition, staff used a transportation risk assessment model (developed by staff) in order to calculate the probability of an accident resulting in a release of a hazardous material due to delivery from the freeway to the facility via Beach Boulevard and the Pacific Coast Highway. Results show a risk about 1 in 1,000,000 for one trip from I-405 and a total annual risk of about 1 in 10,000 for 132 deliveries over a year. This risk was calculated using accident rates on various types of roads (in this case, urban multilane undivided, multilane divided, and two-lane) with distances traveled on each type of road computed separately. Although it is an extremely conservative model in that it includes risk of accidental release from all modes of hazardous materials transportation and does not distinguish between a high-integrity steel tanker truck and other less secure modes, the results still show that the risk of a transportation accident is insignificant.

Staff therefore believes that the risk of exposure to significant concentrations of aqueous ammonia during transportation to the facility is insignificant because of the remote possibility that an accidental release of a sufficient quantity could be dangerous to the public. The transportation of similar volumes of hazardous materials on the nation's highways is neither unique nor infrequent. Staff's analysis of the transportation of aqueous ammonia to the proposed facility (along with data from the U.S. DOT) demonstrates that the risk of accident and exposure is less than significant.

In order to further ensure that the risk of an accident involving the transport of aqueous ammonia to the power plant is insignificant, staff proposed Condition of Certification **HAZ-6** would require the use of only the specified and California Highway Patrol-approved route to the site.

Based on the environmental mobility, toxicity, the quantities at the site, and frequency of delivery, it is staff's opinion that aqueous ammonia poses the predominate risk associated with both use and hazardous materials transportation. Staff concludes that the risk associated with the transportation of other hazardous materials to the proposed project does not significantly increase the risk of ammonia transportation.

Seismic Issues

It is possible that an earthquake could cause the failure of a hazardous materials storage tank. 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 a vapor cloud of hazardous materials that could move off site and affect residents and workers in the surrounding community. The effects of the Loma Prieta earthquake of 1989, the Northridge earthquake of 1994, and the earthquake in Kobe, Japan, in January 1995, have all heightened concerns about earthquake safety.

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 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 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. Referring to the sections on **GEOLOGIC HAZARDS AND RESOURCES** and **FACILITY SAFETY DESIGN** in the AFC, staff notes that the proposed facility will be designed and constructed to the standards (including seismic) of the 2010 California Building Code. Therefore, on the basis of what occurred in Northridge with older tanks and the lack of failures during the Nisqually earthquake (with newer tanks), staff determined that tank failures during seismic events are not probable and do not represent a significant risk to the public.

Site Security

The applicant proposes to use hazardous materials identified by the U.S. EPA as requiring the development and implementation of special site security measures to prevent unauthorized access. The U.S. EPA published a Chemical Accident Prevention Alert regarding site security (EPA 2000a), the U.S. Department of Justice published a special report entitled *Chemical Facility Vulnerability Assessment Methodology* (US DOJ 2002), the North American Electric Reliability Council published *Security Guidelines for the Electricity Sector* in 2002 (NERC 2002), and the U.S. Department of Energy (DOE) published the 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 requiring that facilities that use or store certain hazardous materials 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. While the rule applies to aqueous ammonia solutions of 20% or greater and this proposed facility plans to utilize a 19% aqueous ammonia solution, staff still 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.

The applicant has stated that a security plan will be prepared for the proposed facility and will include a description of perimeter security measures and procedures for evacuating, notifying authorities of a security breach, monitoring fire alarms, conducting site personnel background checks, site access, and a security plan and background checks for hazardous materials drivers. Perimeter security measures utilized for this facility may include security guards, security alarms, breach detectors, motion detectors, and video or camera systems (HBEP 2012a, Section 5.5.5.2.5).

In order to ensure that neither this project nor a shipment of hazardous material is the target of unauthorized access, staff's proposed Conditions of Certification **HAZ-7** and **HAZ-8** address both construction security and operation security plans. These plans would require implementation of site security measures consistent with the above-referenced documents.

The goal of these conditions of certification is to provide for the minimum level of security for power plants necessary for the protection of California's electrical infrastructure from malicious mischief, vandalism, or domestic/foreign terrorist attacks. The level of security needed for the HBEP project 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 the consequences of that event. The results of the off-site consequence analysis prepared as part of the RMP will be used, in part, to determine the severity of consequences of a catastrophic event.

In order to determine the level of security, the Energy Commission staff used an internal vulnerability assessment decision matrix modeled after the U.S. Department of Justice Chemical Vulnerability Assessment Methodology (July 2002), the North American Electric Reliability Council's (NERC) 2002 guidelines, the U.S. DOE 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 determined that this project would fall into the category of medium vulnerability due to the urban setting and close proximity to sensitive receptors. Staff therefore 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 and breach detectors, alarms, site access procedures for employees and vendors, site personnel background checks, and law enforcement contacts in the event of a security breach. The perimeter fencing should include slats or other methods to reduce and restrict the visibility of the site from off-site locations. Site access for vendors shall be strictly controlled. Consistent with current state and federal regulations governing the transport of hazardous materials, hazardous materials vendors will have to maintain their transport vehicle fleet and employ only properly licensed and trained drivers. The project owner will be required, through the use of contractual language with vendors, to ensure that vendors supplying hazardous materials strictly adhere to the U.S. DOT requirements for hazardous materials vendors to prepare and implement security plans (as per 49 CFR 172.800) and to ensure that all hazardous materials drivers are in compliance through personnel background security checks (as per 49 CFR Part 1572, Subparts A and B). The compliance project manager (CPM) may authorize modifications to these measures or may require additional measures in response to additional guidance provided by the U.S. Department of Homeland Security, the U.S. DOE, or the NERC, after consultation with both appropriate law enforcement agencies and the applicant.

CUMULATIVE IMPACTS AND MITIGATION

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. Existing locations that use or store gaseous or liquid hazardous materials, or locations where such facilities might likely be built, were both considered. 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 uncontrolled release. The chances of one uncontrolled 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.

The applicant will develop and implement a hazardous materials handling program for HBEP independent of any other projects considered for potential cumulative impacts. Staff believes that the facility, as proposed by the applicant 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 (about one in one million per year) would independently occur at the HBEP 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.

RESPONSE TO AGENCY AND PUBLIC COMMENTS

Comment: The city of Huntington Beach provided comments from the Huntington Beach Fire Department in the form of a Code Requirements letter regarding standard codes on fire safety and hazardous materials management, which identified specific City of Huntington Beach Municipal and Fire codes and specifications which would apply to the proposed project (CHB 2012a).

Response: Staff agrees and notes that the project would be built to comply with all local laws, ordinances, regulations, and standards (LORS). Notations to the local LORS have been added to the LORS table (Hazardous Materials Management Table 1) in this staff assessment.

COMPLIANCE WITH LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

Staff concludes that construction and operation of the HBEP project would be in compliance with all applicable laws, ordinances, regulations, and standards (LORS) regarding long-term and short-term project impacts in the area of hazardous materials management.

CONCLUSIONS

Staff's evaluation of the proposed project (with proposed mitigation measures) indicates that hazardous material use will pose no significant impact to the public. Staff's analysis also shows that there will be no significant cumulative impact. With adoption of the proposed conditions of certification, the proposed project will comply with all applicable LORS. In response to Health and Safety Code, section 25531 et seq., the applicant will be required to develop a Risk Management Plan (RMP). To ensure the adequacy of the RMP, staff's proposed conditions of certification require that the RMP be submitted for concurrent review by the Huntington Beach Fire Department and by Energy Commission staff. In addition, staff's proposed conditions of certification require the review and approval of the RMP by staff prior to the delivery of any hazardous materials to the facility. Other proposed conditions of certification address the issue of the transportation, storage, and use of aqueous ammonia, in addition to site security matters.

Staff recommends that the Energy Commission impose the proposed conditions of certification, presented herein, to ensure that the project is designed, constructed, and operated to comply with all applicable LORS and to protect the public from significant risk of exposure to an accidental ammonia release. If all mitigation proposed by the applicant and staff are required and implemented, the use, storage, and transportation of hazardous materials will not present a significant risk to the public.

Staff proposes nine conditions of certification mentioned throughout the text (above), and listed below. Condition of Certification **HAZ-1** ensures that no hazardous material would be used at the facility except as listed in **APPENDIX B** of the staff assessment, unless there is prior approval by the Energy Commission compliance project manager. Condition of Certification **HAZ-2** requires that an RMP be prepared and submitted prior to the delivery of aqueous ammonia.

Staff believes that an accidental release of aqueous ammonia during transfer from the delivery tanker to the storage tank is the most probable accident scenario and therefore proposes Condition of Certification (**HAZ-3**) requiring the development of a safety management plan for the delivery of all liquid hazardous materials, including aqueous ammonia. The development of a safety management plan addressing the delivery of all liquid hazardous materials during construction, commissioning, and operations will further reduce the risk of any accidental release not addressed by the proposed spill-prevention mitigation measures and the required RMP. This plan would additionally prevent the mixing of incompatible materials that could result in toxic vapors. Condition of Certification **HAZ-4** requires that the aqueous ammonia storage tank be designed to *high integrity* specifications. The transportation of hazardous materials is addressed in

Conditions of Certification **HAZ-5** and **HAZ-6**. Site security during both the construction and operations phases is addressed in Conditions of Certification **HAZ-7** and **HAZ-8.** Condition of Certification **HAZ-9** addresses the use of natural gas and prohibits its use to clear pipes.

PROPOSED CONDITIONS OF CERTIFICATION

HAZ-1 The project owner shall not use any hazardous materials 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 hazardous materials contained at the facility.

HAZ-2 The project owner shall concurrently provide a Business Plan and a Risk Management Plan (RMP) prepared pursuant to the California Accidental Release Program (CalARP) to the Huntington Beach Fire Department and the CPM for review. After receiving comments from the Huntington Beach Fire Department and the CPM, the project owner shall reflect all recommendations in the final documents. Copies of the final Business Plan and RMP shall then be provided to the Huntington Beach Fire Department for information and to the CPM for approval.

Verification: At least thirty (30) days prior to receiving any hazardous material on the site for commissioning or operations, the project owner shall provide a copy of a final Business Plan to the CPM for approval.

At least thirty (30) days prior to delivery of aqueous ammonia to the site, the project owner shall provide the final RMP to the Certified Unified Program Agency (the Huntington Beach Fire Department) for information and to the CPM for approval.

HAZ-3 The project owner shall develop and implement a Safety Management Plan for delivery of aqueous ammonia and other liquid hazardous materials by tanker truck. 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 including provisions to maintain lockout control by a power plant employee not involved in the delivery or transfer operation. This plan shall be applicable during construction, commissioning, and operation of the power plant.

Verification: At least thirty (30) days prior to the delivery of any liquid hazardous material to the facility, the project owner shall provide a Safety Management Plan as described above to the CPM for review and approval.

HAZ-4 The aqueous ammonia storage facility shall be designed to either the ASME Pressure Vessel Code and ANSI K61.6 or to API 620. In either case, the storage tank shall be protected by a secondary containment basin capable of holding 125 percent of the storage volume or the storage volume plus the volume associated with 24 hours of rain assuming the 25-year storm. The containment basis shall incorporate a vented cover that allows free flow of any aqueous ammonia release into the containment, yet limits the total vent area to not more than 16 square ft. The final design drawings and specifications for the ammonia storage tank and secondary containment basins shall be submitted to the CPM.

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

HAZ-5 The project owner shall direct all vendors delivering aqueous ammonia to the site to use only tanker truck transport vehicles which meet or exceed the specifications of DOT Code MC-307.

Verification: At least thirty (30) days prior to receipt of aqueous ammonia on site, the project owner shall submit copies of the notification letter to supply vendors indicating the transport vehicle specifications to the CPM for review and approval.

HAZ-6 The project owner shall direct all vendors delivering any hazardous material to the site to use only the route approved by the CPM (I-405 to Beach Boulevard (State Highway 39), south onto Pacific Coast Highway (State Highway 1), and left onto Newland Street, then right into the HBEP site). The project owner shall obtain approval of the CPM if an alternate route is desired.

Verification: At least sixty (60) days prior to receipt of any hazardous materials on site, the project owner shall submit copies of the required transportation route limitation direction to the CPM for review and approval.

HAZ-7 Prior to commencing construction, a site-specific Construction Site Security Plan for the construction phase shall be prepared and made available to the CPM for review and approval. The Construction Security Plan shall include the following:

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

6. evacuation procedures.

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

HAZ-8 The project owner shall also prepare a site-specific security plan for the commissioning and operational phases that will be 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 (as per NERC 2002).

The Operation 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 (and with slats or other methods to restrict visibility if a fence is selected;
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;
   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;
6. site access controls for employees, contractors, vendors, and visitors;

7. a statement(s) (refer to sample, **ATTACHMENT C**), signed by the owners or authorized representative of hazardous materials transport vendors, certifying that they have prepared and implemented security plans in compliance with 49 CFR 172.880, and that they have conducted employee background investigations in accordance with 49 CFR Part 1572, subparts A and B;

8. closed circuit TV (CCTV) monitoring system, recordable, and viewable in the power plant control room and security station (if separate from the control room) with cameras able to pan, tilt, and zoom, have low-light capability, and are able to view 100% of the perimeter fence, the ammonia storage tank, the outside entrance to the control room, and the front gate; and,

9. additional measures to ensure adequate perimeter security consisting of either:
   A. security guard(s) present 24 hours per day, 7 days per week; **or**

   B. power plant personnel on site 24 hours per day, 7 days per week, and perimeter breach detectors **or** on-site motion detectors.

The project owner shall fully implement the security plans and obtain CPM approval of any substantive modifications to 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—transformers, gas lines, and compressors—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 Council, after consultation with both appropriate law enforcement agencies and the applicant.

Verification: At least thirty (30) days prior to the initial receipt of hazardous materials on site, the project owner shall notify the CPM that a site-specific operations site 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-9: The project owner shall not allow any fuel gas pipe cleaning activities on site, 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, 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.

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 172.880 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.

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HAZARDOUS MATERIALS
APPENDIX A

Basis for Staff's Use of 75 Parts Per Million Ammonia Exposure Criteria

BASIS FOR STAFF'S USE OF 75 PARTS PER MILLION AMMONIA EXPOSURE CRITERIA

Staff uses a health-based airborne concentration of 75 parts per million (PPM) to evaluate the significance of impacts associated with potential accidental releases of ammonia. While this level is not consistent with the 200-ppm level used by the U.S. Environmental Protection Agency and the California Environmental Protection Agency in evaluating such releases pursuant to the Federal Risk Management Program and State Accidental Release Program, it is appropriate for use in staff's analysis of the proposed project. The Federal Risk Management Program and the State Accidental Release Program are administrative programs designed to address emergency planning and ensure that appropriate safety management practices and actions are implemented in response to accidental releases. However, the regulations implementing these programs do not provide clear authority to require design changes or other major changes to a proposed facility. The preface to the Emergency Response Planning Guidelines states that "these values have been derived as planning and emergency response guidelines, **not** exposure guidelines, they do not contain the safety factors normally incorporated into exposure guidelines. Instead they are estimates, by the committee, of the thresholds above which there would be an unacceptable likelihood of observing the defined effects." It is staff's contention that these values apply to healthy adult individuals and are levels that should not be used to evaluate the acceptability of avoidable exposures for the entire population. While these guidelines are useful in decision making in the event that a release has already occurred (for example, prioritizing evacuations), they are not appropriate for and are not binding on discretionary decisions involving proposed facilities where many options for mitigation are feasible. California Environmental Quality Act requires permitting agencies making discretionary decisions to identify and mitigate potentially significant impacts through feasible changes or alternatives to the proposed project.

Staff has chosen to use the National Research Council's 30-minute Short Term Public Emergency Limit (STPEL) for ammonia to determine the potential for significant impact. This limit is designed to apply to accidental unanticipated releases and subsequent public exposure. Exposure at this level should not result in serious effects but would result in "strong odor, lacrimation, and irritation of the upper respiratory tract (nose and throat), but no incapacitation or prevention of self-rescue." It is staff's opinion that exposures to concentrations above these levels pose significant risk of adverse health impacts on sensitive members of the general public. It is also staff's position that these exposure limits are the best available criteria to use in gauging the significance of public exposures associated with potential accidental releases. It is, further, staff's opinion that these limits constitute an appropriate balance between public protection and mitigation of unlikely events and are useful in focusing mitigation efforts on those release scenarios that pose real potential for serious impacts on the public. Table 1 provides a comparison of the intended use and limitations associated with each of the various criteria that staff considered in arriving at the decision to use the 75-ppm STPEL.

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

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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 - 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 HBEP

TABLE 5.5-2 from AFC Chemical Inventory, Description of Hazardous Materials Stored Onsite, and Reportable Quantities								
Trade Name	**Chemical Name**	**CAS Number**	**Maximum Quantity Onsite**	**CERCLA SARA RQa**	**RQ of Material as Used Onsite**	**EHS TPQc**	**Regulated Substance TQd**	**Prop 65**
Aqueous ammonia (19% NH3 by weight)	Aqueous ammonia	7664-41-7	24,000 gallonsg	100 pounds	526 pounds	500 pounds	500 pounds	No
Aqueous ammonia (19-29.4% NH3 by weight)	Aqueous ammonia	7664-41-7	400 gallons	100 pounds	357 pounds	500 pounds	500 pounds	No
Anti-scalant	Anti-scalant	Various	400 gallons	e	e	e	e	No
Battery Electrolyte	Sulfuric Acid	7664-93-9	1,200 gallons	1,000 pounds	1,075 pounds	1,000 pounds	1,000 pounds	Yes
Citric acid	Citric Acid	77-92-9	625 pounds	e	e	e	e	No
Cleaning chemicals/detergents	Various	None	100 gallons	e	e	e	e	No
Cleaning chemicals/detergents for membrane-based water treatment systems (e.g., NALCO PermaClean PC-77, NALCO PermaClean PC-40, NALCO PermaClean PC-98)	Various	None	25 gallons	e e	e e	e e	e e	No No
Sanitizing chemicals for membrane-based (MF/RO/EDI) water treatment systems (e.g., NALCO PermaClean PC-11)	Dibromoacetonitrile 2,2-Dibromo-3-nitrilopropionamide Polyethylene Glycol	3252-43-5 10222-01-2 25322-68-3	400 gallons	e	e	e	e	No No No
Diesel No. 2	Diesel No. 2	68476-34-6	400 gallons	e	e	e	e	No
Hydraulic oil	Phosphate ester	None	300 gallons	42 gallonsf	42 gallonsf	e	e	No
Laboratory reagents	Various	Various	10 gallons	e	e	e	e	No
Lubrication oil	Oil	None	20,000 gallons	42 gallonsf	42 gallonsf			No
Mineral insulating oil	Oil	8012-95-1	82,000 gallons	42 gallonsf	42 gallonsf			No
Amine solution	Amine	2008-39-1	400 gallons	e	e	e	e	No
Sodium bisulfite (NaHSO3)	Sodium bisulfite	7631-90-5	500 gallons	5,000 pounds	5,000 pounds	e	e	No
Sulfuric acid (93%)	Sulfuric acid	7664-93-9	600 gallons	1,000 pounds	1,075 pounds	1,000 pounds	1,000 pounds	Yes
Sodium hydroxide (NaOH) (20 to 50%)	Sodium hydroxide	1310-73-2	400 gallons	1,000 pounds	800 pounds	e	e	No
Sodium hypochlorite (12.5%)	Sodium hypochlorite	7681-52-9	600 gallons	100 pounds	800 pounds	e	e	No

TABLE 5.5-2 from AFC (continued) Chemical Inventory, Description of Hazardous Materials Stored Onsite, and Reportable Quantities								
Trade Name	**Chemical Name**	**CAS Number**	**Maximum Quantity Onsite**	**CERCLA SARA RQa**	**RQ of Material as Used Onsite**	**EHS TPQc**	**Regulated Substance TQd**	**Prop 65**
Hydrochloric acid	Hydrochloric acid	7647-01-0	25 gallons	5,000 pounds	5,000 pounds	e	15,000 pounds	No
Sodium nitrite	Sodium nitrite	7632-00-0	500 pounds	100 pounds	100 pounds	e	e	No
Proprietary corrosion/scale inhibitor (e.g., NALCO TRAC107)	Inorganic Salt Sodium Hydroxide	Proprietary 1310-73-2	25 gallons	e e	e e	e e	e e	No No
Proprietary non-oxidizing biocide (e.g., NALCO 7330)	5-Chloro-2-Methyl-4-Isothiazolin-3-one (1.1%) 2-Methyl-4-Isothiazolin-3-one (0.3%)	26172-55-4 2682-20-4	400 gallons	e	e	e	e	No No
Propylene Glycol	Propylene Glycol	57-55-6	3000 gallons	e	e	e	e	Yes
Trisodium phosphate (Na3PO4) or phosphate/sodium hydroxide blend (e.g., NALCO BT-3400 or NALCO BT-4000)	Trisodium phosphate	7601-54-9	400 gallons	e	e	e	e	No
Sulfur hexafluoride	Sulfur hexafluoride	2551-62-4	200 pounds	e	e	e	e	No
Acetylene	Acetylene	47-86-2	540 cubic feet	e	e	e	e	No
Oxygen	Oxygen	7782-44-7	540 cubic feet	e	e	e	e	No
Propane	Propane	74-98-6	200 cubic feet	e	e	e	e	No
EPA Protocol gases	Various	Various	2,500 cubic feet	e	e	e	e	No
Cleaning chemicals	Various	Various	Varies (less than 25 gallons of liquids or 100 pounds of solids for each chemical)	e	e	e	e	No
Paint	Various	Various	Varies (less than 25 gallons of liquids or 100 pounds of solids for each type)	e	e	e	e	No

a RQ for a pure chemical, per the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Superfund Amendments and Reauthorization Act (SARA) (Ref. 40 CFR 302, Table 302.4). Release equal to or greater than RQ must be reported. Under California law, any amount that has a realistic potential to adversely affect the environment or human health or safety must be reported. b RQ for materials as used onsite. Since some of the hazardous materials are mixtures that contain only a percentage of an RQ, the RQ of the mixture can be different than for a pure chemical. For example, if a material only contains 10 percent of a reportable chemical and the RQ is 100 lb., the RQ for that material would be (100 lb)/(10%) = 1,000 lb. c Extremely Hazardous Substance (EHS) TPQ (Ref. 40 CFR Part 355, Appendix A). If quantities of extremely hazardous materials equal to or greater than the TPQ are handled or stored, they must be registered with the local Administering Agency. d TQ is from 19 California Code of Regulations (CCR) 2770.5 (state) or 40 CFR 68.130 (federal) e No reporting requirement. Chemical has no listed threshold under this requirement. f State RQ for oil spills that will reach California state waters [Ref. CA Water Code Section 13272(f)] g The ammonia tank capacity is 24,000 gallons; however, the tank is only filled to 85 percent of its capacity, or 20,400 gallons.

LAND USE

Testimony of Steven Kerr

SUMMARY OF CONCLUSIONS

The proposed Huntington Beach Energy Project (HBEP) would be consistent with the applicable laws, ordinances, regulations, and standards pertaining to land use planning, and would not generate a significant impact under the California Environmental Quality Act (CEQA) guidelines. The proposed project is consistent with the current development patterns for the area established by the city of Huntington Beach Land Use and Coastal Elements and Zoning Ordinance.

The proposed project would not result in conversion of any farmland (as classified by the Farmland Mapping and Monitoring Program) to non-agricultural use, conflict with existing agricultural zoning or Williamson Act contracts or result in conversion of forest land to non-forest use. In addition, the proposed project would be compatible with existing on-site and nearby land uses, consistent with the planned public and semi-public development for the city of Huntington Beach, and would not divide an established community.

The project would conform with the General Plan, including the Local Coastal Program. The project would be consistent with development standards of the Coastal Zone (CZ) Overlay District, the Public-Semipublic (PS) zone base zoning district, as well as other applicable provisions of the Municipal Code. On April 7, 2014, the city council of the City of Huntington Beach adopted a resolution supporting proposed architectural improvements which included findings for a variance to exceed the maximum height requirement for the PS zone (CHB 2014a). The city's findings have been incorporated into this Final Staff Assessment (FSA). An assessment of the proposed architectural improvements is included in the **VISUAL RESOURCES** section.

The proposed project would not result in any physical land use incompatibilities with the existing surrounding land uses in the following areas: **Air Quality, Noise and Vibration, Public Health, Hazardous Materials Management, Traffic and Transportation, and Visual Resources**.

Socioeconomics Figure 1 does not identify the presence of an environmental justice community. Therefore, the population in the six-mile buffer does not constitute an environmental justice population as defined by *Environmental Justice: Guidance Under the National Environmental Policy Act* and would not trigger further scrutiny for purposes of an environmental justice analysis.

INTRODUCTION

This land use analysis addresses project compatibility with existing or reasonably foreseeable[1] land uses; consistency with applicable city of Huntington Beach and state LORS; and potential project related direct, indirect, and cumulative environmental effects.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS (LORS)

Land Use Table 1 lists the state and local land use LORS applicable to the proposed project. The proposed project's consistency with these LORS is analyzed under the "Assessment of Impacts and Discussion of Mitigation" subsection and in **Land Use Table 2**. The project site does not involve federally managed lands, therefore, there are no identified applicable federal land use related LORS.

Land Use Table 1
Applicable Laws, Ordinances, Regulations, and Standards (LORS)

Applicable LORS	Description
State	
Title 20 California Code of Regulations, Ch. 5, Art. 6, App. B(g)(3)(C)	An Energy Commission siting regulation that ensures a project will be located on a single legal parcel if the proposed site consists of more than one legal parcel. The merger or lot line adjustment need not occur prior to a decision on the Application but must be completed prior to the start of construction.
Warren-Alquist Act, Public Resources Code § 25500 et seq. California Coastal Act, Public Resources Code §30000, et seq.	The Coastal Act establishes a comprehensive approach to govern land use planning along the entire California coast. The Coastal Act also sets forth general policies (Public Resources Code §30200 et seq.) that govern the California Coastal Commission's review of permit applications and local plans. In the case of energy facilities, Section 30600 of the Coastal Act states: (a) Except as provided in subdivision (e), and in addition to obtaining any other permit required by law from any local government or from any state, regional, or local agency, any person, as defined in Section 21066, wishing to perform or undertake any development in the coastal zone, other than a facility subject to Section 25500, shall obtain a coastal development permit. Section 25500 states that the Energy Commission has exclusive power to certify sites for power generation facilities 50 megawatts or greater and related facilities anywhere in the state.
Public Resources Code §25529 of the Warren-Alquist Act	Persuant to section 25529 of the Warren-Alquist Act, the Energy Commission shall require public access to coastal resources as a condition of certification of a facility proposed in the Coastal Zone as follows: "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, as a condition of certification of any facility contained in the application, that an area be established for public use, as determined by the commission. Lands within such area shall be acquired and maintained by the applicant and shall be available for public access and use, subject to restrictions required for security and public safety. The applicant may

[1]Whether a project is reasonably foreseeable (i.e., a "probable future project") for purposes of cumulative impact analysis depends on the nature of the resource in question, the location of the project, and the type of project. (14 California Code of Regulations, Section 15130(b)(2).

Applicable LORS	Description
	dedicate such public use zone to any local agency agreeing to operate or maintain it for the benefit of the public. If no local agency agrees to operate or maintain the public use zone for the benefit of the public, the applicant may dedicate such zone to the state. The commission shall also require that any facility to be located along the coast or shoreline of any major body of water be set back from the shoreline to permit reasonable public use and to protect scenic and aesthetic values."
Local	
City of Huntington Beach General Plan	The General Plan for the city of Huntington Beach, adopted May 13, 1996, provides the framework for management and utilization of the city's physical, economic and human resources. The General Plan establishes the location, types, intensity and distribution of land uses throughout the city, including areas within the coastal zone. The General Plan is organized into the following Chapters: Community Development; Infrastructure and Community Services; and Natural Resources; and Hazards. In addition, the city has adopted a Coastal Element that serves as the city's Local Coastal Program, and was certified by the California Coastal Commission in March 1985.
Huntington Beach Zoning and Subdivision Ordinance	The Zoning Ordinance establishes specific zone districts and land use regulations for properties within the city.
City of Huntington Beach Urban Design Guidelines	The Urban Design Guidelines implement the Urban Design Element of the General Plan. The Guidelines provide guidance for various types of uses, as well as specific comments regarding lighting, landscaping, and other features of specific sites within the community.
City of Long Beach General Plan Land Use Element	HBEP would include a 16-acre lay down site at AES Alamitos Generating Station in the city of Long Beach. The city of Long Beach General Plan Land Use Element addresses the long-range use and development of land within the city.
City of Long Beach Zoning Regulations	Regulates land use and development within the city in conformance with the General Plan.

SETTING

PROJECT SITE

The proposed Huntington Beach Energy Project site is located at 21730 Newland Street in the city of Huntington Beach, just northeast of the intersection of the Pacific Coast Highway (Highway 1) and Newland Street. The project would be located entirely within the existing Huntington Beach Generation Station, an operating power plant.

HBEP would be a natural gas-fired, combined-cycle, air-cooled, 939-megawatt (MW) electrical generating facility consisting of two independently operating, three-on-one, combined-cycle gas turbine power blocks. Other equipment and facilities to be constructed and shared by both power blocks include natural gas compressors, water treatment facilities, emergency services, and administration and maintenance buildings.

The Assessor's Parcel Numbers (APN) for the HBEP site are 114-150-82 and 114-150-96. HBEP would utilize a 28.6 acre portion of APN 114-150-96. If the proposed project is approved by the Energy Commission, following approval and prior to commencing construction of the first power block, the project owner shall obtain a lot line adjustment to establish a single parcel for the 28.6 acre HBEP site. This is included as staff's proposed Condition of Certification **LAND-1**.

The access to the HBEP site would continue to be from Newland Street. Newland Street is a two- to four-lane secondary arterial that connects Pacific Coast Highway in the south to the city of Huntington Beach boundary in the north.

Construction Lay down and Parking Areas

HBEP construction would require both onsite and offsite lay down and construction parking areas. According to the Application for Certification (AFC), approximately 22 acres of construction lay down would be needed. Approximately six acres at the Huntington Beach Generation Station are proposed to be used for a combination of lay down and construction parking, and 16 acres at the AES Alamitos Generation Station (AGS) would be used for construction lay down (component storage only/no assembly of components at AGS) (AFC, Figure 5.6-4). During HBEP construction, the large components would be hauled from the construction lay down area at the AGS site to the HBEP site as they are ready for installation. (HBEP 2012a, p. 1-2)

Construction worker parking for HBEP and the demolition of the existing units at the Huntington Beach Generation Station would be provided by a combination of onsite and offsite parking. A maximum of 330 parking spaces would be required during construction and demolition activities. The proposed construction/demolition worker parking areas are listed in **Land Use Table 2** below and are identified in **Traffic and Transportation Figure 4.** The parking areas designated by the applicant would accommodate over 1,000 parking spaces which would be more than adequate for the highest number of workers anticipated for HBEP construction.

Land Use Table 2
HBEP Construction Parking Areas

Parking Area Location	Parking Area size	Number of Spaces (approximately)
On-site at HBEP	1.5-acres	130
Plains All American Tank Farm, adjacent to HBEP	1.9-acres	170
Graded area West of HBEP site on Newland Street	3-acres	300
Graded area NE corner of PCH and Beach Blvd.	2.5-acres	215
City of Huntington Beach South Beach Parking Lot SW corner of PCH and Beach Blvd.	N/A	225
Total Number of Spaces		1,040

Source: HBEP2012a

Establishing temporary parking lots for use by HBEP construction workers within the city of Huntington Beach would typically require approval of a coastal development permit, but for the exclusive jurisdiction of the Energy Commission (CHB 2012a). Through discussions with city staff and reviewing the general plan and zoning code, it is clear that maintaining access to shore parking areas for residents and visitors is a priority for the city. As stated in the March 16, 2012, letter from the city of Huntington Beach, the city has expressed a willingness to allow parking for up to 225 construction and demolition workers personal vehicles for HBEP within the city's South Beach parking lot (HBEP 2012a, Appendix 5.12D). To ensure adequate access for residents and visitors, the city would prohibit the use of the South Beach parking lot by construction workers on weekends, from Memorial Day to Labor Day, and on holidays during the summer (Memorial Day, Fourth of July, and Labor Day). The applicant has also provided letters from each of the entities who own or control the other three private offsite construction parking areas indicating a willingness to allow construction worker parking (HBEP 2012n). Additionally, the applicant proposes to shuttle construction workers from the off-site parking areas to the project site. Staff is recommending Condition of Certification **TRANS-3** which would require the applicant to prepare a traffic control plan to ensure all construction workers parking is in place as designated in this analysis. Upon implementation of the plan, construction workforce parking impacts would be less than significant. For additional information regarding construction workforce parking, please see the **TRAFFIC AND TRANSPORTATION** section of this assessment.

Transmission Lines and Infrastructure

The existing Huntington Beach Generation Station has various ancillary facilities that would support the HBEP, such as the Southern California Gas Company (SoCalGas) natural gas pipeline serving the site, the existing onsite Southern California Edison (SCE) 230-kV switchyard, and the existing connections to the city of Huntington Beach potable water system and sanitary sewer system. Other existing infrastructure at the existing Huntington Beach Generation Station, such as distribution and storage systems would also be reused to the greatest extent possible.

SURROUNDING AREA

Much of the city has been developed, with many of the remaining undeveloped parcels committed to development by specific plans and development agreements or preserved for open space. The city's General Plan indicates that the "…fundamental patterns, distribution, and form of development of use have been established" (CHB 1996, p. II-LU-II).

Existing land uses immediately adjacent to and nearby the proposed HBEP site within Huntington Beach include:

- North: The area immediately adjacent to the project site includes the Southern California Edison 230 kV Switchyard and several empty fuel oil storage tanks. Between Edison Drive and the Huntington Beach Channel are an animal hospital, auto wrecking, and a recycling center. Beyond the channel uses transition from mini-storage and warehouses to residential neighborhoods with parks and schools.

- South: A narrow strip of land which is home to the Wetlands and Wildlife Care Center shares a property boundary and is adjacent to the existing HBGS which separates the HBEP site from Pacific Coast Highway. Across the highway is the Huntington Beach State Park and Pacific Ocean.
- East: Immediately adjacent to the southeast of the project site and southwest of the channel is the Huntington Beach Wetland Preserve / Magnolia Marsh Restoration Project area, a designated Environmentally Sensitive Habitat Area (ESHA). The Huntington Beach Channel (a facility operated by the Orange County Flood Control District [OCFCD]) runs to the east of the project site. Across the channel to the east is another tank farm and to the northeast is the Ascon/Nesi Landfill within the Magnolia Pacific Specific Plan area. To the east of Magnolia Street is an established low density residential neighborhood. The Orange County Sanitation District is between Brookhurst Street and the Santa Ana River.
- West: Across Newland Street are the Huntington-By-The-Sea Mobile Home and RV Park and Cabrillo Mobile Home Park. Also of note to the northwest, is a partially completed new subdivision, Pacific Shores with bungalow and townhome units currently for sale. The Downtown Specific Plan and Beach and Edinger Corridors Specific Plan areas are west beyond more coastal conservation areas.

The following are educational, park, recreation, church, and hospital land uses within one mile of the project site:

- Huntington State Beach
- Ralph Bauer Public Park
- Edison Community Park
- Edison High School
- Kettler Elementary School
- Eader Park and Library
- Gisler Park
- The Church of Jesus Christ of Latter-day Saints
- Brethern Christian Junior and Senior High School
- Seeley Park

The State of California maintains ownership and jurisdiction of the Huntington Beach State Park. The remainder of the study area is within the city limits of Huntington Beach.

The project site and surrounding area do not contain land identified as Important Farmlands (CDOC 2010).

GENERAL PLAN LAND USE AND ZONING DESIGNATIONS

Land Use Figure 1 (General Plan Land Use Designations Map) and **Land Use Figure 2** (Zoning and Subdivision Ordinance Map) illustrate the land use and zoning designations of the proposed power plant site. In addition, these figures illustrate the land use and zoning designations of lands within the one-mile buffer of the proposed power plant site. The land use and zoning designations of the areas surrounding the proposed project are presented to help illustrate the affected local agencies' existing and planned pattern of land use development in the project area.

PROJECT SITE

The HBEP site is designated by the Huntington Beach General Plan as Public (P). The Huntington Beach General Plan states that typical permitted uses include governmental administrative and related facilities, such as public utilities, schools, public parking lots, infrastructure, religious and similar uses (CHB 1996, p. II-LU-25). The goal of this land use designation is to achieve the development of a mix of governmental service, institutional, educational, and religious uses that support the needs of Huntington Beach's residents (CHB 1996, p. II-LU-42).

Included in the city of Huntington Beach General Plan Land Use Element is a Community District and Subarea Schedule. The Community District and Subarea Schedule describes the intended functional role of each of the city's principal subareas and references the applicable permitted uses, densities, and pertinent overlays. Development shall adhere to the policies for permitted use and design and development prescribed for each land use category in the preceding section of the Land Use Element and any additional specific design and development standards listed in the schedule. The HBEP site is within Subarea 4G "Edison Plant" (CHB 1996, Figure LU-6, p. II-LU-66). Land use categories within Subarea 4G include Public (P) and Conservation (OS-C) with permitted uses of wetlands conservation and utility uses. The corresponding specific design and development standard listed in the schedule is Policy LU 13.1.8. This policy is to ensure that the city's public buildings, sites, and infrastructure improvements are designed to be compatible in scale, mass, character, and architecture with existing buildings and pertinent design characteristics prescribed by this General Plan for the district or neighborhood in which they are located, and work with non-city public agencies to encourage compliance (CHB 1996, p. II-LU-43).

General Plan land use designations for the four temporary HBEP offsite construction/demolition parking areas are as follows:

- Newland Street – Residential Medium Density (RM-15)
- Pacific Coast Highway and Beach Boulevard – Commercial Visitor (CV-F2)
- City of Huntington Beach shore parking – Open Space Shoreline (OS-S)
- Plains All American Tank Farm – Public (PS)

The HBEP site is zoned Public-Semi-public (PS), and is included in the Coastal Zone Overlay District (CZ), as well as the Oil Production Overlay District (O). Uses allowed in the PS district include major and minor utilities, cemeteries, cultural institutions, hospitals, park and recreation facilities, public safety facilities, general residential care, and schools. The zoning code provides that major utilities are subject to a conditional use permit. Major utilities are defined as: Generating plants, electrical substations, above-ground electrical transmission lines, switching buildings, refuse collection, transfer, recycling or disposal facilities, flood control or drainage facilities, water or wastewater treatment plants, transportation or communications utilities, and similar facilities of public agencies or public utilities.

Within the O overlay district, oil operations are permitted subject to certain conditions. Because the project does not concern oil operations, the O overlay district is not discussed further. Within the CZ overlay district, a development requires a Coastal Development Permit.

Zoning for the four potential temporary offsite construction/demolition parking areas are as follows:

- Newland Street – Industrial Limited (IL)
- Pacific Coast Highway and Beach Boulevard – Commercial Visitor (CV) and Coastal Conservation (CC)
- City of Huntington Beach shore parking – Downtown Specific Plan (SP-5)
- Plains All American Tank Farm – Public-Semi-public (PS)

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

Energy Commission staff has analyzed the information provided in the AFC and has acquired information from other sources to determine consistency of the proposed HBEP with applicable land use LORS and the proposed project's potential to have significant adverse land use-related impacts.

METHOD AND THRESHOLD 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.[2]

[2] 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.

- 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(g)).
- Loss of forest land or conversion of forest land to non-forest use.
- Changes in the existing environment which, due to their location or nature, could result in conversion of Farmland to non-agricultural use[3] or conversion of forest land to non-forest use.

➢ 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.

➢ 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.[4]An unmitigated noise, odor, public health or safety hazards, visual, or adverse traffic affect on surrounding properties.

DIRECT/INDIRECT IMPACTS AND MITIGATION

This section discusses the applicable potential project impacts and associated methods and thresholds of significance referenced above.

AGRICULTURE AND FOREST

<u>Would the project convert Farmland to non-agricultural use?</u>

The proposed HBEP site does not contain, and would therefore not convert, any farmland with FMMP designations of Prime Farmland, Farmland of Statewide Importance, Unique Farmland, or Farmland of Local Importance to non-agricultural use. The proposed HBEP would have no impact with respect to farmland conversion.

[3] 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.
[4] 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 (CEQA Guidelines §15355; 40 CFR 1508.7)

<u>Would the project conflict with existing zoning for agricultural use or a Williamson Act contract?</u>

The California Land Conservation Act, commonly referred to as the Williamson Act, enables local governments to enter into contracts with private landowners for the purpose of restricting specific parcels of land to agricultural or related open space uses. (Chapter 7, Agricultural Land, Gov. Code § 51200-51297.4) There are no existing agricultural uses present on the proposed project site. The proposed HBEP is not located on land that is under a Williamson Act contract and as a result would not conflict with any Williamson Act contracts.

<u>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 Pub. Resources Code §4526), or timberland zoned Timberland Production (as defined by Gov. Code §51104(g))?</u>

The proposed project site is not zoned for forest land, timberland, or for timberland production. In addition, there is no land zoned for such purposes within one mile of the project site. Therefore, there would be no conflict with, or cause for, rezoning of forest land or timberland and as a result there would be no impact to forest land or timberland.

PHYSICAL DISRUPTION OR DIVISION OF AN ESTABLISHED COMMUNITY

The proposed HBEP would be located within the boundaries of an existing power plant that has been in its current location since the late 1950s. Access to the proposed project would be through existing rights-of-way on Newland Street. The project site is also located adjacent to Pacific Coast Highway which is a major transportation corridor. In addition, the proposed project is located on lands designated and zoned for public utility uses, including electrical generating facilities, subject to approval of a conditional use permit and coastal development permit. There would not be a need to relocate any residences as a result of the HBEP. Therefore, the HBEP would not physically divide or disrupt any community within Huntington Beach. In addition, the proposed project would not involve the displacement of any existing development or result in new development that would physically divide an existing community.

CONFLICT WITH ANY APPLICABLE HABITAT OR NATURAL COMMUNITY CONSERVATION PLAN

The HBEP is not located within any Habitat Conservation Plan or Natural Community Conservation Plan and there will be no conflicts as a result of the proposed project.

CONFLICT WITH ANY APPLICABLE LAND USE PLAN, POLICY OR REGULATION

Energy Commission staff evaluates (Cal. Code Regs., tit. 20, § 1744) the information provided by the applicant in the AFC (and any supplemental information), project design, site location, and operational components to determine if elements of the proposed project would conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project, or that would normally have jurisdiction over the project except for the Energy Commission's exclusive authority. As part of the licensing process, the Energy Commission must determine whether a proposed facility complies with all applicable state, regional, and local LORS (Pub. Resources Code § 25523[d][1]). The Energy Commission must either find that a project conforms to all applicable LORS or make specific findings that a project's approval is justified even where the project is not in conformity with all applicable LORS (Pub. Resources Code § 25525). When determining LORS compliance, staff is required to give "due deference" to an agency's assessment of whether a proposed project is consistent with LORS under the agency's jurisdiction (Cal. Code Regs. tit. 20, § 1714.5). On past projects, staff has requested that an agency provide a discussion of the findings and conditions that the agency would make when determining whether a proposed project would comply with the agency's LORS, were they the permitting authority. Any conditions recommended by an agency are considered by Energy Commission staff for inclusion in the proposed conditions of certification for the project.

WARREN-ALQUIST ACT

The Warren-Alquist Act (Pub. Resources Code § 25500 et seq.), discusses the Energy Commission's statutory requirement for a public use area for facilities proposed in the Coastal Zone.

Pursuant to § 25529 of the Warren-Alquist Act, the Energy Commission shall require the establishment of an area for public use as a condition of certification of a facility proposed in the Coastal Zone as follows:

"When a facility is proposed to be located in the Coastal Zone or any other area with recreational, scenic, or historic value, the [Energy] Commission shall require, as a condition of certification of any facility contained in the application, that an area be established for public use, as determined by the Commission. Lands within such area shall be acquired and maintained by the applicant and shall be available for public access and use, subject to restrictions required for security and public safety. The applicant may dedicate such public use zone to any local agency agreeing to operate or maintain it for the benefit of the public. If no local agency agrees to operate or maintain the public use zone for the benefit of the public, the applicant may dedicate such zone to the state. The [Energy] Commission shall also require that any facility to be located along the coast or shoreline of any major body of water be set back from the shoreline to permit reasonable public use and to protect scenic and aesthetic values."

The HBEP would be located entirely within the site of the existing Huntington Beach Generation Station and no new off-site facilities would be constructed.. The Huntington State Beach is located to the southwest of the project site across the Pacific Coast Highway, which provides two miles of existing public access to the coast. An additional 3.5 miles of city beach with public access continues north of the state beach. Therefore, staff believes that in this case reasonable access for public use of the nearby coastal areas currently exists and no additional lands would need to be acquired by the applicant.

CALIFORNIA COASTAL ACT

The project must demonstrate consistency with the Coastal Act policies, which constitute the standards used by the California Coastal Commission (Coastal Commission) in its coastal development permit decisions.

The project site is located within the Coastal Zone in the city of Huntington Beach. The California Coastal Act requires each local government with land area located within the Coastal Zone to prepare a local coastal program (LCP) for management of such land areas. Once the Coastal Commission certifies a LCP, the authority to issue "coastal development permits" for development within the coastal zone is delegated to the local jurisdiction. (Public Resources Code §30519(a))

Notwithstanding the provisions of Section 30519, the Coastal Act, in Section 30600(a), provides that a coastal development permit is not required for a facility subject to the provisions of Public Resources Code Section 25500 (i.e., a thermal power plant or related facility subject to the Warren-Alquist Act).

While HBEP is under the exclusive jurisdiction of the Energy Commission, sections 30413(d) and (e) of the Coastal Act expressly authorize the Coastal Commission to participate in Energy Commission siting proceedings for any thermal power plant to be located within the coastal zone and provide findings with respect to specific measures needed to bring a project into conformity with Coastal Act and LCP policies.

Coastal Commission staff submitted a letter on August 3, 2012, providing initial comments and another on January 23, 2013, providing an update on the status of their review (CCC 2012a, CCC 2013a). Energy Commission staff also had phone conversations with Coastal Commission staff following the receipt of their letters to ensure that Coastal Commission staff's concerns are addressed throughout this FSA (HBEP 2014a). .Coastal Commission staff plans to present their report on the HBEP's conformity to relevant provisions of the Coastal Act and certified local coastal plan at the Coastal Commission meeting scheduled for June 11th through the 13th in Huntington Beach. If the Coastal Commission approves their staff's report, then the report will be forwarded to the Energy Commission following the meeting (HBEP 2014b).

City of Huntington Beach General Plan

As part of staff's analysis of local LORS compliance and to determine the city's view of the project's consistency with its LORS, staff has had personal communications with city of Huntington Beach staff regarding LORS compliance.

State law requires each county and city to prepare and adopt a comprehensive and long-range general plan for its physical development (Government Code Section 65300). The general plan must include elements such as land use, circulation, housing, open-space, conservation, safety, and noise as identified in state law (Government Code Section 65302), to the extent that the topics are locally relevant. Once a general plan is adopted, its maps, diagrams, and development policies form the basis for a jurisdiction's zoning, subdivision, and public works actions. Under California law, no specific plan, area plan/community plan, zoning, subdivision map, nor public works project may be approved unless the jurisdiction finds that it is consistent with the adopted general plan.

The General Plan for Huntington Beach was adopted by the city council on May 13, 1996; several of the elements have since been updated and amended. The General Plan, as mandated by state law, sets forth the comprehensive, long-range plan to serve as a guide for the physical development of the city. Each element of the General Plan is organized into statements of Goals, Objectives, Policies, and Implementation Programs. The General Plan Elements are organized into four chapters: Community Development (includes Land Use, Urban Design, Historic and Cultural Resources, Economic Development, Growth Management and Housing Elements); Infrastructure and Community Services (includes Circulation, Public Facilities and Public Services, Recreation and Community Services and Utilities Elements); Natural Resources (includes Environmental Resources/Conservation, Air Quality and Coastal Elements); and Hazards (includes Environmental hazards, Noise and Hazardous Materials Elements).

Land Use Element

The project site is designated as Public, which includes governmental administrative and related facilities, such as public utilities, schools, public parking lots, infrastructure, religious and similar uses (CHB 1996, Table LU-2a). The power plant at the site has been in operation since the late 1950s, was previously owned by Southern California Edison, and is generally referenced in General Plan documents as the Edison Plant.

The following provisions of the Land Use Element are relevant to the project:

> Land Use Element, Goal LU-2, seeks to ensure that development is adequately served by transportation and utility infrastructure, and public services. The project would be part of the effort to generate adequate and reliable electric power needed for use by local communities, including Huntington Beach. The project would also be built within an existing electrical generating facility site served by existing infrastructure and services adequate to support additional development. The General Plan recognizes the need for such service, and the project would, therefore, appear to be consistent with this policy.

The General Plan recognizes the value of diversity in land uses, while calling for the city to maintain environmental resources, scale, and character (Goal LU-7). As part of this effort, Policy 7.1.1 provides for the accommodation of existing uses and new development consistent with the Land Use and Density Schedules. The project use is consistent with the General Plan designation of Public; the schedules provide for no density standard for this designation. The project appears to be consistent with these provisions.

Goal LU-13 seeks to achieve the development of a mix of governmental service, institutional, educational and religious uses that support the needs of Huntington Beach's residents. Objective LU 13.1 calls for the continuation of existing and development of new uses that support the needs of existing and future residents. Policy 13.1.1 allows for the continuation of existing public and private institutional, cultural, educational, and health uses at their present locations and development of new uses in areas designated for such uses on the Land Use Map. These provisions of the General Plan identify diversity in land uses as having value to the community. The project would develop and operate new power generators within the site of an existing electrical generating facility, and provide service and employment that is identified in the General Plan as a priority. The project would appear to be consistent with these provisions.

Table LU-4 in the Community Development Chapter identifies the "Edison Plant" on the Community District and Subarea Schedule. The site characteristic is listed as "Permitted Use," and the "Standards and Principles" section provides as follows: Category: Public ("P") and Conservation ("OS-C"): Wetlands Conservation, Utility Uses. Under the characteristic "Design and Development," the General Plan provides that it shall be in accordance with Policy LU 13.1.8, which states as follows: "Ensure that the city's public buildings, sites, and infrastructure improvements are designed to be compatible in scale, mass, character and architecture with existing buildings and pertinent design characteristics prescribed by this General Plan for the district or neighborhood in which they are located, and work with non-city public agencies to encourage compliance."

The emphasis in these provisions is on compatibility with surrounding uses and neighborhood characteristics. Please refer to the **VISUAL RESOURCES** section of this staff assessment for a discussion of the project's consistency with Policy LU 13.1.8 and other LORS relevant to the project's visual impact. The project's consistency with other provisions of the Coastal Element and Zoning Ordinance is discussed below. The proposed project would not construct new off-site facilities. For a discussion of the project's impacts on the wetlands adjacent to the site, please refer to the **BIOLOGICAL RESOURCES** section of this staff assessment.

Coastal Element

The proposed project is located in the Coastal Zone, and is subject to the Coastal Element of the General Plan. The Coastal Element also is part of the city's certified Local Coastal Program (LCP). The LCP consists of a Land Use Plan (Coastal Element) and an Implementation Program. The Implementation Program consists of the city's Zoning Code (the entire document), Zoning District Maps, and six Specific Plans.

Consistent with the Land Use Element, the project site is also designated within the Coastal Element as Public (P). The Coastal Element identifies the existing land use of the site as a regionally serving electrical generating plant, in which Coastal Element policy provides for the use to continue (Coastal Element, p. IV-C-80). The Coastal Element also provides the Community District and Sub-area Schedule in Table C-2, which is the same as Land Use Element Table LU-4 mentioned above.

The existing Huntington Beach Generation Station site is recognized in the Coastal Element as an important coastal-dependent facility within the Coastal Zone. The Coastal Element identifies several issues relating to energy facilities. The following issues regarding energy are specifically related to the HBEP:

1. Visually degraded areas in the Coastal Zone should be enhanced. Design review, placing transmission lines underground, screening the electrical energy generating plant and oil facilities, preserving mature trees, and litter control should be promoted to enhance aesthetic quality of the city's scenic coastal resources.

2. Huntington Beach accommodates energy related facilities within its Coastal Zone. The potential adverse safety, aesthetic and biological impacts of these facilities to the community and its coastal resources must be minimized to the maximum extent feasible through municipal regulation and coordination with responsible outside agencies.

3. Unitization, and consolidation of energy facilities should be encouraged to increase efficiency and safety, and minimize aesthetic and biological impacts to coastal resources.

4. Compatibility between energy related facilities and other land uses could be increased through the use of buffers, screening, and setbacks.

5. Beach access and aesthetics could be improved through energy facility consolidation, improved maintenance of energy facilities, screening and buffering.

The goals, objectives and policies of the Coastal Element are intended to address these identified issues, as well as the requirements of the Coastal Act.

Goal C-1 is to develop a land use plan for the Coastal Zone that protects and enhances coastal resources, promotes public access and balances development with facility needs.

Objective C 1.1 is to ensure that adverse impacts associated with coastal zone development are mitigated or minimized to the greatest extent feasible. Throughout this staff assessment, staff proposes conditions of certification with the intent of ensuring that adverse impacts associated with HBEP are mitigated or minimized to the greatest extent feasible. Policy C 1.1.1 states that with the exception of hazardous industrial development, new development shall be encouraged to be located within, contiguous or in close proximity to, existing developed areas able to accommodate it or, where such areas are not able to accommodate it, in other areas with adequate public service and where it will not have significant adverse effects, either individually or cumulatively, on coastal resources. The project appears to be consistent with these provisions in that the project would be developed within an existing electrical generating facility site and would not result in a change in land use that adversely affects coastal resources.

Objective C 1.2 is to provide a land use plan that balances location, type and amount of land use with infrastructure needs and Policy 1.2.1 is to accommodate existing uses and new development in accordance with the Coastal Element Land Use Plan and the Development and Density Schedule Table. The Coastal Element Land Use Plan and Development Density Schedule Table C-1, designates the project site Public (P). The Coastal Element describes the existing project site as a regionally serving electrical generating plant and provides for the use to continue.

Goal C-8 seeks to accommodate energy facilities with the intent to promote beneficial effects while mitigating any potential adverse impacts. Objective C 8.2 encourages the production of energy resources as efficiently as possible with minimal adverse impacts and Policy C 8.2.4 supports accommodating coastal dependent energy facilities within the Coastal Zone consistent with the Coastal Act. The existing Huntington Beach Generation Station is defined as a coastal-dependent energy facility in the city of Huntington Beach. Based on the priority of the city of Huntington Beach's Coastal Element to redevelop existing industrial parcels in the coastal zone rather than establishing new industrial parcels in the coastal zone, the repowering of the existing Huntington Beach Generation Station through the implementation of the HBEP is consistent with the Coastal Element as it would reuse and connect to existing industrial infrastructure, including the: existing SCE switchyard, existing city of Huntington Beach potable water and sanitary sewer pipelines, and the existing Huntington Beach Generation Station's ocean outfall for discharge of storm water and process water.

In their December 6, 2012 letter, the city of Huntington Beach noted that residents and others have expressed opinions that the elimination of once-through-cooling using ocean water eliminates the need to site the HBEP at the existing Huntington Beach Generation Station location (CHB 2012a). Staff has determined that the HBEP on its current site would avoid potential impacts due to the development of new water, gas and sewer lines, a new switchyard and transmission lines as well as development of an undeveloped site. For additional information regarding the elimination of once-through-cooling, reuse of the existing SCE switchyard and transmission lines, and the importance of the location to provide essential electrical service, please see the **PROJECT DESCRIPTION**, **TRANSMISSION SYSTEM ENGINEERING, AND ALTERNATIVES.**

The general plan land use designations and several goals, objectives, and policies of the general plan would support the redevelopment and continuance of the electrical generating facility use at the project site.

City of Huntington Beach Zoning Ordinance

The HBEP site is zoned Public–Semipublic (PS), and is included in the Coastal Zone Overlay District (CZ), as well as the Oil Production Overlay District (O). The Huntington Beach Zoning and Subdivision Ordinance defines a power plant as an Energy Facility (Section 203.06) and is classified as a Major Utility use within the Public and Semipublic Use Classifications (Section 204.08). Major Utility uses are permitted in the Public – Semipublic District upon the issuance of a Conditional Use Permit by the city of Huntington Beach (Section 241.02). Within the CZ overlay district, any development requires the issuance of a Coastal Development Permit by the city of Huntington Beach (Section 245.10). But for the Energy Commission's exclusive authority to license the project, siting the HBEP at the proposed location would require the following land use actions by the city of Huntington Beach:

- A Variance to exceed the maximum allowable structure height within the PS zone.
- A Conditional Use Permit to allow development of a Major Utility use within the PS zone.
- A Coastal Development Permit to allow development within the CZ overlay district.

The applicable development standards within the PS zone and CZ overlay district for HBEP are presented as follows.

Minimum Lot Area: The 28.6-acre HBEP site would meet the minimum lot area standard of 2 acres.

Minimum Lot Width: The HBEP site would meet the minimum lot width of 100 feet.

Minimum Setbacks: The minimum required front setback is ten feet, which the project as proposed would comply with. There is no required side or rear yard setback. However, a 100-foot buffer from environmentally sensitive habitat areas is required within the CZ overlay district. The project will comply with the 100-foot buffer requirement, which is further discussed in the **Biological Resources** section.

Maximum Height of Structures: The maximum allowable height in the PS zone and CZ overlay district is 50 feet, with the exception that necessary mechanical appurtenances may exceed the maximum permitted height by no more than 10 feet. The existing HBGS consists of two power blocks each with one existing 200 foot high stack. The six proposed stacks for HBEP are each approximately 120 feet high. In addition to the six stacks, HBEP proposes two power blocks, each with three heat steam recovery generators with a proposed height of 92 feet, and each has one air cooled condenser with a proposed height of 104 feet. Additionally, the proposed architectural screening consists of three surfboards, two metal mesh wave forms, and trompe l'oeil painting on the air cooled condensers. The surfboards and metal mesh forms each have an approximate height of 125 feet. Therefore, the new proposed power plant, associated structures, and architectural screening would exceed the maximum height limitations by approximately 42-75 feet.

On April 7, 2014, the city council of the City of Huntington Beach adopted a resolution supporting proposed architectural improvements and findings for a variance to exceed the maximum height requirement for the PS zone (CHB 2014a). The city's findings have been incorporated below into the discussion of the necessary findings the city would make to grant a variance to exceed the maximum height requirements, but for the exclusive jurisdiction of the Energy Commission.

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 PS zone is 1.5. The project would comply with this requirement as the FAR of the project buildings would be approximately 0.04 (HBEP 2012n, p. 83, HBEP 2013m).

Signs: Any proposed signage is required to be consistent with Chapter 233 Signs of the Huntington Beach Zoning and Subdivision Ordinance.

The city's requirements for landscaping and screening of outdoor facilities and mechanical equipment are discussed in the **VISUAL RESOURCES** section of the FSA. An assessment of the proposed architectural improvements is also included in the **VISUAL RESOURCES** section.

But for the exclusive jurisdiction of the Energy Commission to license the HBEP, Huntington Beach would need to make the following findings to approve the conditional use permit, variance, and coastal development permit. Additional discussion is provided in italics below each required finding.

Variance Findings:

1. The granting of a variance will not constitute a grant of special privilege inconsistent with limitations upon other properties in the vicinity and under an identical zone classification.

   The existing HBGS is located on property within the PS (Public Semipublic) zoning district which allows major and minor utilities. The existing structures are approximately 200 feet high and have been operating on the subject site since the 1950s. The proposed project would eliminate the less efficient existing facility and replace it with a modern state of the art combined cycle electrical generation facility. The height of the HBEP's stacks (approximately 120 feet high) are a result of the engineering and design requirements to meet the air quality permitting requirements of the South Coast Air Quality Management District (AQMD). The Final Staff Assessment concludes that no feasible design alternatives would eliminate the need for stacks in excess of the city's height limitations. Therefore, without the stacks at proposed height, the property cannot continue to operate as an electrical generating facility.

2. Because of special circumstances applicable to the subject property, including size, shape, topography, location or surroundings, the strict application of the zoning ordinance is found to deprive the subject property of privileges enjoyed by other properties in the vicinity and under identical zone classification.

Because of special circumstances applicable to the subject property, including size, location or surroundings, the strict application of the zoning ordinance may deprive the subject property of privileges enjoyed by other properties in the vicinity and under identical zone classification. The site is unique in that an electrical generating station has been operating at the site since the 1950s and it is already serviced by a high pressure natural gas pipeline to facilitate electrical generation and an electrical transfer station to transfer the generated power into the overall electrical grid. The presence of these infrastructure components are unique to a power plant and demonstrate the special circumstances applicable to the location and the subject property. Additionally, the requirement to eliminate ocean water for once through cooling combined with the site's lack of access to a feasible water supply for wet cooling creates a unique circumstance requiring dry cooling to accommodate electrical energy generation. Furthermore, air quality regulatory requirements that apply due to the site location require the use of stacks that exceed the maximum height limit. The strict application of the zoning ordinance would deprive HBEP of the existing privileges enjoyed by the 1950s era HBGS, which operates under the same zoning classification. Additionally, there are other existing approximately 70 ft high electrical tower structures that have been approved and constructed exceeding maximum height limitations in Low Density Residential zones, Residential Agriculture zones, and Public Semi-Public zones. The strict application of the zoning ordinance would deprive HBEP of the existing privileges enjoyed by the current power generating station and other existing electrical tower structures operating under the same and other zoning classifications.

3. The granting of a variance is necessary to preserve the enjoyment of one or more substantial property rights.

   Exceeding maximum height limitations may be necessary to preserve the enjoyment of one or more substantial property rights because the Public Semi-Public zoning classification allows major and minor utilities and the height variance would be necessary to allow AES to demolish and reconstruct a more efficient, lower profile electrical power generating station. Exceeding the maximum 50 ft height limit for the proposed approximately 120 ft high electrical generating plant along with approximately 125 ft high architectural screening would not constitute a grant of special privilege inconsistent with limitations upon other properties in the vicinity and under an identical zone classification. There are other existing approximately 70 ft high electrical tower structures that have been approved and constructed exceeding maximum height limitations in Low Density Residential zones, Residential Agriculture zones, and Public Semi-Public zones. The strict application of the zoning *ordinance would deprive HBEP of the existing privileges enjoyed by the current power generating station and other existing electrical tower structures operating under the same and other zoning classifications.*

4. The granting of the variance will not be materially detrimental to the public welfare or injurious to property in the same zone classification and is consistent with the General Plan.

Exceeding maximum height limitations would not be materially detrimental to the public welfare or injurious to property in the same zone classification and would not adversely affect the General Plan. The overall site has favorable geology and soils suitable for the power plant development. No new offsite development would be needed for HBEP, such as upgrades or additions to the existing electric transmission system or natural gas pipeline system. The Public land use designation is consistent with power plant development. Construction of

HBEP may result in the reduction of certain environmental impacts as compared to the existing HBGS. Construction of the HBEP also includes architectural enhancements to soften the view of the new structures, create a focal point through the use of surfboards and wave forms, and to blend in with the surrounding environment through the use of trompe l'oeil painting effects on the air cooled condensers. The architectural improvements serve to preserve and enhance public visual resources as required in the Coastal Zone overlay. Although the proposed structures do not comply with maximum height limitations, the portions that exceed the maximum 50 ft height limit are a small percentage of the overall improvements on the 28.6 acre site. Therefore, exceeding maximum height limitations for HBEP and associated architectural improvements would not be materially detrimental to the public welfare or injurious to property in the same zoning classification and is consistent with the General Plan.

<u>Conditional Use Permit Findings:</u>

1. The establishment, maintenance and operation of the use will not be detrimental to the general welfare of persons working or residing in the vicinity nor detrimental to the value of the property and improvements in the neighborhood.

   The HBGS has been operating at the site since the 1950s. No new offsite development would be needed for the HBEP, such as upgrades or additions to the existing electric transmission system or natural gas pipeline system. The Public land use designation is consistent with power plant development. Construction of HBEP may result in the reduction of certain environmental impacts as compared to the existing HBGS. Construction of the HBEP also includes architectural enhancements to soften the view of the new structures, create a focal point through the use of trompe l'oeil painting effects on the air cooled condensers. The architectural Improvements serve to preserve and enhance public visual resources as required in the Coastal Zone overlay. Therefore, the establishment, maintenance and operation of the use would not be detrimental to the general welfare of persons working or residing in the vicinity nor detrimental to the values of the property and improvements in the neighborhood.

2. The granting of the conditional use permit will not adversely affect the General Plan.

   The HBEP project site is designated "Public" under the city of Huntington Beach General Plan. An energy facility (public utility, major utility, generating plant) is an allowed use in the "Public" general plan designation.

3. The proposed use will comply with the provisions of the base district and other applicable provisions in Title 20-25 and any specific conditions required for the proposed use in the district in which it would be located.

   The HBEP project site is designated "Public-Semipublic" in the Huntington Beach Zoning and Subdivision Ordinance. An energy facility is an allowed use in the "Public-Semipublic" zone. With the implementation of the proposed conditions of certification, the HBEP would conform to all applicable development requirements of the city of Huntington Beach Zoning and Subdivision Ordinance.

<u>Coastal Development Permit Findings:</u>

1. Local Coastal Plan. That the development project, as proposed or as modified by conditions of approval, conforms to the General Plan, including the Local Coastal Program.

   The project site is designated within the Coastal and Land Use elements of the General Plan as Public (P). The Coastal Element identifies the existing land use of the site as a regionally serving electrical generating plant, in which Coastal Element policy provides for the use to continue (Coastal Element, p. IV-C-80). The proposed architectural improvements serve to preserve and enhance public visual resources as required in the Coastal Zone overlay. Additionally, staff has proposed conditions of certification throughout this FSA to ensure that the concerns presented thus far by Coastal Commission staff have been addressed.

2. Zoning Provisions. That the project is consistent with the requirements of the CZ Overlay District, the base zoning district, as well as other applicable provisions of the Municipal Code.

   As described above, the proposed project is consistent with development standards of the CZ Overlay District, the PS zone base zoning district, as well as other applicable provisions of the Municipal Code.

3. Adequate Services. That at the time of occupancy, the proposed development can be provided with infrastructure in a manner that is consistent with the Local Coastal Program.

   HBEP would reuse existing onsite potable water, natural gas, storm water, process wastewater and sanitary pipelines, and electrical transmission facilities. See the ***PROJECT DESCRIPTION*** *section of this staff assessment for specific infrastructure details.*

4. California Coastal Act: That the development conforms to the public access and public recreation policies of Chapter 3 of the California Coastal Act.

   The HBEP would be located entirely within the site of the existing Huntington Beach Generation Station. The Huntington State Beach provides two miles of existing public access to the coast and is located to the southwest of the project site across the Pacific Coast Highway. An additional 3.5 miles of city beach with public access continues north of the state beach.

Southeast Coastal Redevelopment Plan

The proposed HBEP is within the project area of the Southeast Coastal Redevelopment Plan. The plan was prepared by the Huntington Beach Redevelopment Agency to establish a process and framework for the agency to implement the plan's goals. The plan includes the goal to assist with screening, design, or environmental improvements to mitigate impacts on adjoining neighborhoods and environmentally sensitive areas associated with modernization and reconstruction of the AES power generating plant. As required by Assembly Bill (AB) 1X 26, the city's redevelopment agency was dissolved in early 2012, with the city being designated as the successor agency and the Huntington Beach Housing Authority as the successor agency for housing-related items. Under AB 1X 26, the redevelopment agency can only make payments that are on the approved Enforceable Obligation Payment Schedule (EOPS) and the Recognized Obligation Payment Schedule (ROPS). Improvements to the HBEP site are not included on the EOPS or ROPS. While no redevelopment funds would be available for the city to contribute to screening, design, and environmental improvements at the site, the City of Huntington Beach and the applicant have developed an architectural improvement plan that would improve the visual characteristics of the proposed project. An assessment of applicable city policies regarding screening and design improvements and the proposed architectural improvement plan is included in the **VISUAL RESOURCES** section of the FSA.

Lay down Area

Staging for HBEP construction would include the use of sixteen acres of vacant land at the AES Alamitos Generation Station (AGS) in the city of Long Beach for off-site construction lay down. The lay down area at AGS would be located in an area designated as Mixed Use District in the City of Long Beach General Plan Land Use Element and within the South East Area Development and Improvement Plan (SEADIP) specific plan. Within the SEADIP, the project's offsite construction lay down area and surrounding parcels are located in Subarea 19, which allows for and is currently developed with industrial uses. The activities related to HBEP construction at AGS would be limited to outdoor component storage only. No construction or assembly of equipment would take place at AGS. The offsite construction lay down area will be ancillary to the existing industrial use at AGS which is an allowable use within Subarea 19. For a detailed discussion of the heavy haul routes and equipment staging process see the **TRAFFIC AND TRANSPORTATION** section of this staff assessment.

COMPLIANCE WITH LORS

Staff's independent analysis of the HBEP concludes that the project would comply with all applicable LORS. **Land Use Table 3** summarizes the HBEP project conformance with applicable LORS.

Land Use Table 3
LORS Applicable to the Land Use Analysis

Applicable LORS	Description	Consistency Determination	Basis for Consistency
State			
Title 20 California Code of Regulations, Ch. 5, Art. 6, App. B(g)(3)(C)	Ensures the project site is a single parcel, in accordance with the Energy Commission's siting regulations.	Yes	Proposed Condition of Certification **LAND-1** would ensure that a Lot Line Adjustment is obtained prior to construction.
California Coastal Act	Establishes a comprehensive approach to govern land use planning along the entire California coast.	Yes	The development of the project as modified by conditions of certification would conform to the General Plan, including the LCP, and provisions of the Municipal Code. The project can be provided with adequate services and conforms to the public access requirements of the Coastal Act.
Local			
City of Huntington Beach General Plan	Provides comprehensive, long-range plans, policies, and goals to guide the physical development of the city.	Yes	The project site is designated Public (P). Utilities are an allowed use.
Land Use Element Goal LU-2 Policy LU 2.1.2	Ensure that Development is adequately served by transportation infrastructure, utility infrastructure, and public services. Require that the type, amount, and location of development be correlated with the provision of adequate supporting infrastructure and services	Yes	The project would generate electric power for use by local communities. The project is proposed within an existing electrical power facility site served by infrastructure and services adequate to support additional development.
Goal LU-7 Policy LU 7.1.1	Achieve a diversity of land uses that sustain the city's economic viability, while maintaining the city's environmental resources and scale and character. Accommodate existing uses and new development in accordance with the Land Use and Density Schedules.	Yes	The project use is consistent with the Public designation as identified in the Land Use and Density Schedules.
Goal LU-13 Objective LU 13.1	Achieve the development of a mix of governmental service, institutional, educational, and religious uses that support the needs of Huntington Beach residents. Provide for the continuation of existing and development of new uses, such as governmental administrative, public safety, human service, cultural, educational, infrastructure, religious, and other uses that support the needs of existing and future residents and businesses.	Yes	The project would develop and operate new power generators within the site of an existing facility, and provide electrical service for existing and future residents and businesses.

Applicable LORS	Description	Consistency Determination	Basis for Consistency
Policy 13.1.1	Allow for the continuation of existing public and private institutional, cultural, educational, and health uses at their present locations and development of new uses in areas designated on the Land Use Plan Map in accordance with Policy LU 7.1.1.		
Coastal Element Goal C1 Objective C 1.1 Policy C 1.1.1 Objective C 1.2 Policy 1.2.1	Develop a land use plan for the Coastal Zone that protects and enhances coastal resources, promotes public access and balances development with facility needs. Ensure that adverse impacts associated with coastal zone development are mitigated or minimized to the greatest extent feasible. With the exception of hazardous industrial development, new development shall be encouraged to be located within, contiguous or in close proximity to, existing developed areas able to accommodate it or, where such areas with adequate public services, and where it will not have significant adverse effects, either individually or cumulatively, on coastal resources. Provide a land use plan that balances location, type and amount of land use with infrastructure needs. Accommodate existing uses and new development in accordance with the Coastal Element Land Use Plan and the Development Density Schedule Table C-1.	Yes	The project would be developed within an existing electrical generating facility and would not result in a change in land use that would adversely affect coastal resources or public access. The proposed architectural improvements serve to preserve and enhance public visual resources as required in the Coastal Zone overlay. The proposed conditions of certification would ensure that adverse impacts associated with the project are mitigated or minimized to the greatest extent feasible. The Coastal Element Land Use Plan and Development Density Schedule Table C-1, designates the project site Public (P). The Coastal Element describes the existing project site as a regionally serving electrical generating plant and provides for the use to continue.
Goal C8 Objective C 8.2 Policy C 8.2.4	Accommodate energy facilities with the intent to promote beneficial effects while mitigating any potential adverse impacts. Encourage the production of energy resources as efficiently as possible with minimal adverse impacts. Accommodate coastal dependent energy facilities within the Coastal Zone consistent with Sections 30260 through 30264 of the Coastal Act.	Yes	The existing Huntington Beach Generation Station is defined as a coastal-dependent energy facility within the city of Huntington Beach. Based on the priority of the city of Huntington Beach's Local Coastal Plan to redevelop existing industrial parcels in the coastal zone rather than establishing new industrial parcels in the coastal zone, the repowering of the existing Huntington Beach Generation

Applicable LORS	Description	Consistency Determination	Basis for Consistency
			Station through the implementation of the HBEP is consistent with the Local Coastal Plan as it will reuse and connect to existing industrial infrastructure, including the: existing SCE switchyard, existing Southern California Gas Company high pressure natural gas pipeline, existing city of Huntington Beach potable water and sanitary sewer pipelines, and the existing Huntington Beach Generation Station's ocean outfall for discharge of storm water and process water.
City of Huntington Beach Zoning Ordinance 214.06 PS District: Land Use Controls	The PS Public-Semipublic District is established by this chapter.	Yes	Major utility uses are allowed in the PS district on approval of a conditional use permit.
214.08 PS District Development Standards	Prescribes development standards for the PS district.	Yes	The project has been designed to meet all of the required development standards of the PS district, except for the maximum height requirement. The city of Huntington Beach has recommended an architectural improvement plan and provided the findings they would make to grant a variance to exceed the maximum height requirement, but for the Energy Commissions exclusive authority to license the project.
221.22 Buffer Requirements	Requires a 100 foot buffer from environmentally sensitive habitats identified in the LCP.	Yes	The project has been designed to comply with the 100 foot buffer.
City of Long Beach General Plan Land Use Element	The AGS is included within the SEADIP area.	Yes	The offsite lay down area is located in Subarea 19 of the SEADIP area, which allows for industrial use.
City of Long Beach Zoning Code	The AGS is zone PD-1 (Planned Development) SEADIP	Yes	The temporary offsite construction lay down area will be consistent with the city's zoning regulation, and is an allowable use within Subarea 19.

LAND USE COMPATIBILITY

The proposed project would be located entirely within the site of the existing Huntington Beach Generation Station. The property has been used since the late 1950s for the purpose of electrical power generation. The project represents continued use of a site committed to ensuring reliable generation is maintained at an electrical system location critical to southern California. The proposed HBEP is consistent with the city's land use designations and zoning and would not constitute a change in the current development pattern of the city, as established by the city's adopted General Plan. Furthermore, the project is compatible with the existing ancillary facilities of the Huntington Beach Generation Station which would be reused to support HBEP such as the Southern California Gas Company (SoCalGas) natural gas pipeline serving the site, the existing onsite SCE 230-kV switchyard, and the existing connections to the city of Huntington Beach potable water system and sanitary sewer system.

When a jurisdictional authority, such as the city of Huntington Beach, establishes zoning designations to implement its general plan, it is that agency's responsibility to ensure the compatibility of adjacent zoning and permitted uses and incorporate conditions and restrictions that ensure those uses will not result in a significant adverse impact to surrounding properties. As noted in the discussion above under the section titled **PHYSICAL DISRUPTION OR DIVISION OF AN ESTABLISHED COMMUNITY** and in **Land Use Table 3,** development of the proposed project and its associated facilities would not divide an established community.

A project may generate a potential significant environmental impact related to land use if it would introduce an unmitigated noise, odor, public health or safety hazard, visual, or adverse traffic affect on surrounding properties.

The proposed project would not result in any physical land use incompatibilities with the existing surrounding land uses in the following areas: **Air Quality, Noise and Vibration, Public Health, Hazardous Materials Management, Traffic and Transportation, and Visual Resources**. Therefore, staff concludes that the proposed project would not result in any physical land use incompatibilities with the existing surrounding land uses.

CUMMULATIVE IMPACTS

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.§15065(a)(3).

The cumulative land use and planning analysis considers past, current and probable future projects that are relatively near the proposed project that would contribute to cumulative impacts by impacting agricultural or forest lands, disrupt or divide an established community, conflict with applicable land use plans, policy or regulation, or conflict with an applicable habitat conservation plan or natural community conservation plan.

Land Use Table 4 (below) displays the reasonably foreseeable significant sized development projects within approximately one mile of the project site in the city of Huntington Beach.

Land Use Table 4
Cumulative Projects

Project Title	Location	Project Description	Status of Project
Demolition of retired HBGS generating units	HBGS facility, 21730 Newland St, Huntington Beach	Units 3 & 4 of existing HBGS are slated for demolition in 2016.	Pending current project approval.
Poseidon Desalination Plant	HBGS facility, 21730 Newland St, Huntington Beach	Seawater intake pretreatment facilities	Approved by city in 2006. Permits are currently being secured. Waiting for Coastal Commission action. Construction estimated from Summer 2014 to Summer 2017.
Newland Street Residential (Pacific Shores)	West of Newland St, south of Lamond Dr, north of Hamilton, Huntington Beach	204 multi-family residential units and 2 acre park	Completed
Ascon Landfill Site	Ascon Landfill, Southwest corner of Magnolia St and Hamilton Ave, Huntington Beach	Industrial and oil field waste removal from defunct landfill	On-going project
The Strand	155 5th Street, Huntington Beach	Hotel, retail, restaurants, and parking	Completed and opened May 16, 2009
Pierside Pavilion Expansion	300 Pacific Coast Hwy, Huntington Beach	Expansion of the existing Pierside Pavilion development	Approved by Huntington Beach City Council Sept. 2012
Pacific City	21002 Pacific Coast Highway, Huntington Beach	31-acre site broken into 3 parcels. One for 516 residential apartments and two for commercial, retail and hotel (250-room, 8-story)	Entitlements approved 2004. Pending building permits.
Hilton Waterfront Beach Resort Expansion	21100 Pacific Coast Hwy, Huntington Beach	Expansion of existing resort, including a nine-story tower providing a total of 156 new guestrooms	Approved by Planning Commission in March 2012. Construction to start in 2014, six month construction period
Newland Street Widening	Newland Street, Huntington Beach	Street widening	Completed
P2-92 Sludge Dewatering and Odor Control	Brookhurst St and PCH, and Huntington State Beach and Santa Ana River	Construction of facilities to replace existing sludge dewatering system and associated odor control ventilation system in Plant 2.	No planned date for construction

Source: Huntington Beach Energy Project AFC Figure 5.6-5

CUMULATIVE IMPACTS ANALYSIS

The following land use areas have been analyzed with regard to cumulative land use impacts.

Agriculture and Forest

The project as proposed does not have any impacts to agricultural or forest lands or conflict with any land that is zoned for agricultural purposes and therefore, does not contribute to cumulative impacts related to this land use area.

Physical Disruption or Division of an Established Community

Because the HBEP would be located entirely within the existing Huntington Beach Generation Station site and would not physically disrupt or divide an established community, it would not contribute to a cumulative impact in this land use area.

Conflict with Any Applicable Habitat or Natural Community Conservation Plan

The HBEP does not conflict with any habitat or natural community conservation plans and will not contribute to any cumulative impacts in this land use area.

Conflict with Any Applicable Land Use Plan, Policy or Regulation

Staff’s analysis of the information available shows that the project would not conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction, with the inclusion of the proposed conditions of certification. The HBEP would not result in cumulative impacts in this land use area.

NOTEWORTHY PUBLIC BENEFITS

There are no land use-related benefits associated with the HBEP.

RESPONSE TO PUBLIC AND AGENCY COMMENTS

As of the publication of the FSA, staff has not received any public comments regarding land use issues. Staff solicited comments from the city of Huntington Beach and the Coastal Commission regarding LORS compliance and measures that would be required of the project by these agencies but for the exclusive jurisdiction of the Energy Commission; their comments are included in this analysis.

CONCLUSIONS AND RECOMMENDATIONS

The proposed HBEP would be located entirely within the existing Huntington Beach Generation Station, an operating power plant site, in the city of Huntington Beach.

Staff concludes the HBEP:

- Would not convert any farmland (as classified by the Farmland Mapping and Monitoring Program) to non-agricultural use, conflict with existing agricultural zoning or Williamson Act contracts or convert forest land to non-forest use.
- Would not conflict with existing zoning for agricultural use or a Williamson Act contract.
- Would not conflict with existing zoning for, or cause rezoning of, forest land, timberland, or timberland zoned Timberland Production.
- Would not result in the loss of forest land or conversion of forest land to non-forest use.
- Would not directly or indirectly divide an established community or disrupt an existing or recently approved land use.
- Would not be consistent with the maximum allowable height limit within the PS zone and CZ overlay district of the city of Huntington Beach Zoning Code.
- Would be consistent with development standards of the CZ Overlay District, the PS zone base zoning district, as well as other applicable provisions of the Municipal Code.
- Would conform with the California Coastal Act and City of Huntington Beach Local Coastal Program (LCP).
- The proposed project would not result in any physical land use incompatibilities with the existing surrounding land uses.
- Would not conflict with any applicable habitat conservation plan or natural community conservation plan.
- Would not result in 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.

PROPOSED CONDITION OF CERTIFICATION

LAND-1 The project owner shall comply with Appendix B(g)(3)(c) of the Siting Regulations (Title 20, California Code of Regulations) by ensuring the Project, excluding linear and temporary lay down or staging area, will be located on a single legal parcel.

Verification: At least 30 days prior to construction of the first power block, the project owner shall submit evidence to the compliance project manager (CPM), indicating approval of a Lot Line Adjustment by the city of Huntington Beach, establishing a single parcel for the 28.6 acre HBEP site. The submittal to the CPM shall include evidence of compliance with all conditions and requirements associated with the approval of the Lot Line Adjustment by the city.

REFERENCES

HBEP 2012a – AES Southland Development, LLC / Stephen O'Kane (tn 66003). *Application for Certification (AFC), Volume I & II, dated, June 27, 2012*. Submitted to CEC/ Dockets on June 27, 2012.

HBEP 2012n – Stoel Rives LLP / Melissa A. Foster (tn 68366). *Applicant's Responses to Staff's Data Requests, Set 1A (#1-72), dated, November 2, 2012.* Submitted to CEC/ Dockets on November 2, 2012.

HBEP 2013m – CH2MHILL / Robert Mason (tn 69878). *AES Response to Staff Query-Use and Number of Stories for Specific HBEP Building, dated March 8, 2013.* Submitted to CEC/ Dockets on March 8, 2013.

HBEP 2014a – CEC Staff's Status Report #9 (tn 201520) dated 3/6/14.

HBEP 2014b – CEC Staff's Status Report #11 (tn 201837) dated 1/8/14.

CCC 2012a – California Coastal Commission/ Tom Luster (tn 66483). *CA Coastal Commission's Comments on Data Adequacy Review for AFC, dated August 3, 2012.* Submitted to CEC/ Dockets on August 3, 2012.

CDOC 2010 – California Department of Conservation, Farmland Mapping and Monitoring Program, website accessed on December 20, 2012: http://www.conservation.ca.gov/dlrp/FMMP/Pages/Index.aspx

CHB 1996 – City of Huntington Beach General Plan, Community Development Chapter, Land Use Element, Updated 1996, http://www.huntingtonbeachca.gov/files/users/planning/land_use_element.pdf

CHB 2001 – City of Huntington Beach General Plan, Natural Resources Chapter, Coastal Element, Updated 2001 – Amended 2011, http://www.huntingtonbeachca.gov/government/departments/Planning/gp/coastalelement.cfm

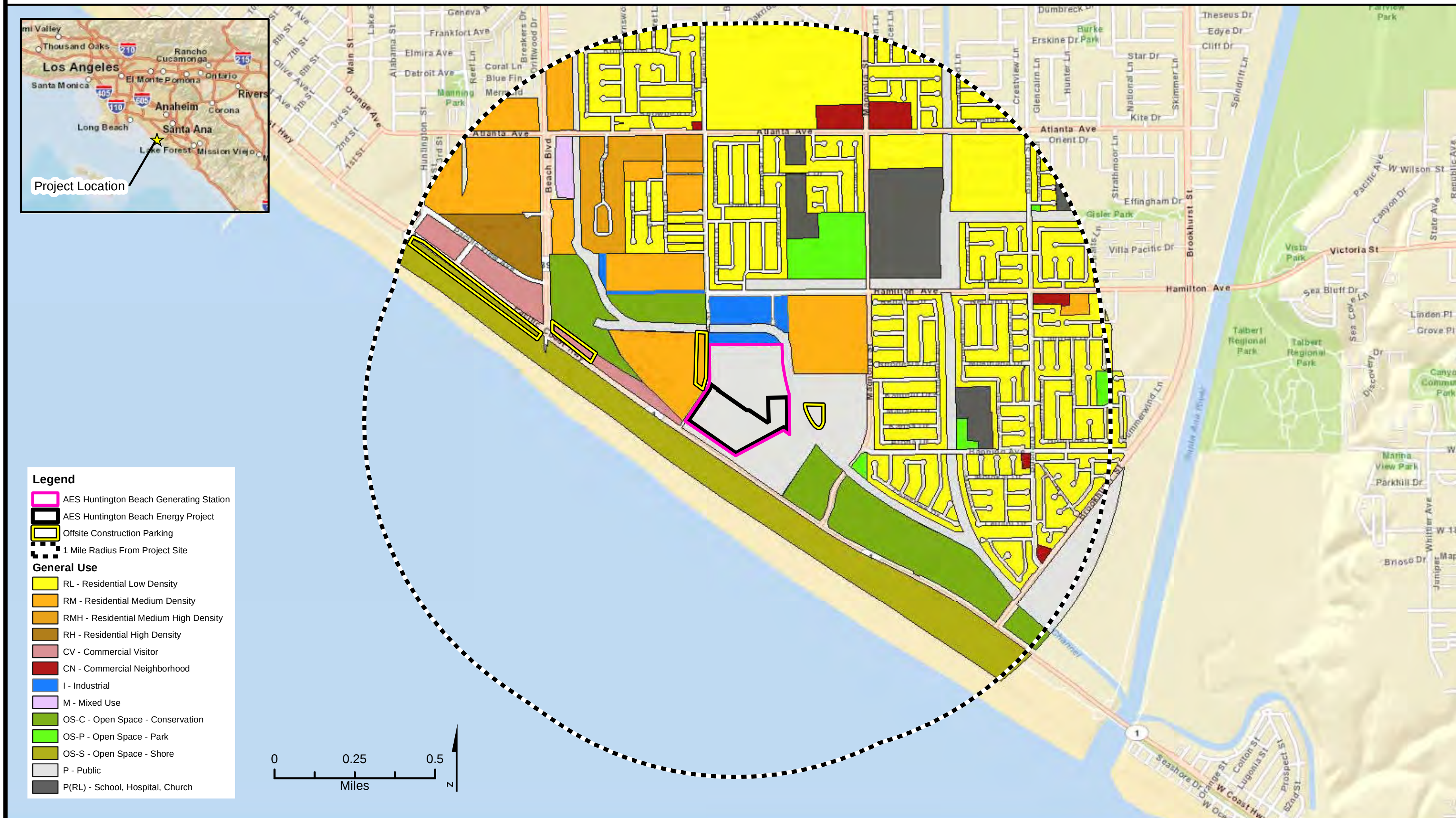
CHB 2012a – City of Huntington Beach / Dept of Planning & Building / Aaron Klemm / Jane James (tn 68804). *City of Huntington Beach Comments on the Huntington Beach Energy Project, dated December 6, 2012*. Submitted to CEC/ Dockets on December 7, 2012.

CHB 2012z – City of Huntington Beach Zoning and Subdivision Ordinance. December 20, 2012. http://www.huntingtonbeachca.gov/government/Elected_Officials/city_clerk/Zoning_Code/

CHB 2014a – City of Huntington Beach / City Council Resolution No. 2014-18 (tn 202084). *Resolution from the City of Huntington Beach Supporting Proposed Architectural Improvements, dated June 27, 2012.* Submitted to CEC/ Dockets on April 16, 2014.

LAND USE - FIGURE 1

Huntington Beach Energy Project - Land Use Designations

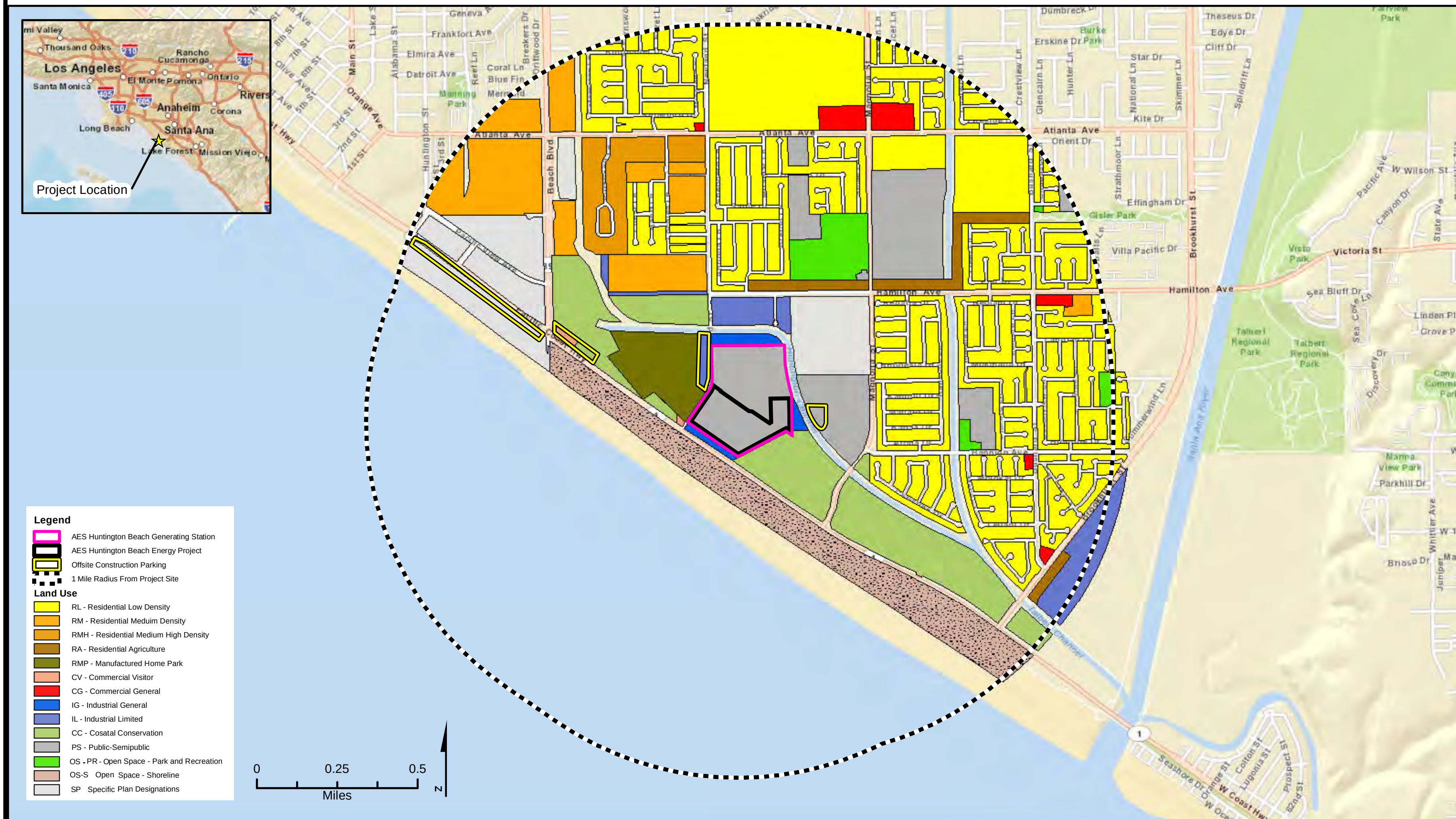


CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCE: AFC, Figure 5.6 - 2

LAND USE - FIGURE 2

Huntington Beach Energy Project - Zoning and Subdivision Ordinance



CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCE: AFC, Figure 5.6 - 3

NOISE AND VIBRATION

Testimony of Edward Brady and Shahab Khoshmashrab

SUMMARY OF CONCLUSIONS

If built and operated in conformance with the proposed conditions of certification, the Energy Commission staff (staff) believes that the Huntington Beach Energy Project (HBEP) would comply with all applicable noise and vibration LORS. 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. Staff further concludes that conditions requiring ongoing measurement, feedback and resolution, particularly those under **NOISE-4**, ensure the newly configured power facility would be acoustically compatible with nearby residential neighborhoods and public access areas.

INTRODUCTION

The construction and operation of any power plant creates noise or unwanted sound. The character and loudness of this noise, the times of day or night that it is produced, and the proximity of the facility to sensitive receptors all combine to determine whether the facility would meet applicable noise control laws and ordinances and whether it would cause significant adverse environmental impacts. In some cases, vibration may be produced as a result of power plant construction practices such as blasting or pile driving. The ground-borne energy of vibration has the potential to cause structural damage and annoyance.

The purpose of this analysis is to identify and examine the likely noise and vibration impacts from the construction and operation of the HBEP project. Staff recommends procedures to ensure that the resulting noise and vibration impacts would be adequately mitigated to comply with applicable laws, ordinances, regulations and standards (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** at the end of this section.

Noise Table 1
Laws, Ordinances, Regulations and Standards

<table>
<tr><th>Applicable LORS</th><th>Description</th></tr>
<tr><td>Federal:
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>State:
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>Local:
City of Huntington Beach Municipal Code, Noise Ordinance, Chapter 8.40, Noise Control</td><td>Prohibits construction between 8 p.m. and 7 a.m. on Mondays through Saturdays and all day Sundays and federal holidays

Provides the following noise limits for exterior locations.
<table>
<tr><th colspan="3">Exterior Noise Standards (CNEL[1])</th></tr>
<tr><th>Noise Zone</th><th>Noise Level (dBA)</th><th>Time Period</th></tr>
<tr><td>1 Residential</td><td>55
50</td><td>7 am – 10 pm
10 pm – 7 am</td></tr>
<tr><td>2 Office</td><td>55</td><td>Anytime</td></tr>
<tr><td>3 Commercial</td><td>60</td><td>Anytime</td></tr>
<tr><td>4 Industrial</td><td>70</td><td>Anytime</td></tr>
</table></td></tr>
<tr><td>City of Huntington Beach General Plan, Noise Element</td><td>Establishes goals, objectives, and policies that address noise issues within the City's jurisdiction</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.

[1] see **NOISE APPENDIX A** for the definition of the CNEL metric

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 when a pure tone is present, the applicable noise standard should be lowered (made more stringent) by five A-weighted decibels (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

<u>City of Huntington Beach LORS</u>

The project is located within the city limits of Huntington Beach, an incorporated city within Orange County. The City of Huntington Beach Noise Ordinance 8.40 of the Municipal Code (City of Huntington Beach 2012) applies to this project.

The City of Huntington Beach establishes noise compatibility guidelines in the Noise Element for Huntington Beach (City of Huntington Beach 1996). These guidelines are used to evaluate the noise impacts from new projects to determine compliance with local noise LORS. Land use categories and their corresponding maximum allowable noise exposure levels (in terms of L_{DN}) can be found in the Goals, Objectives, and Policies section of the Huntington Beach Noise Element and partially summarized in **Noise Table 2** below. (See **NOISE APPENDIX A** for the definition of the L_{DN} Metric.) The Noise Element principally outlines prescribed mitigation measures.

Noise Table 2
City of Huntington Beach Noise Element

Goal	Objective	Policies	Description	Limit
N1 Adopt/Enforce LORS	N1.2 Prevent/Mitigate Noise	N1.2.1 "Sensitive" Use Impact	Maximum Interior noise levels for new residential, heath care, schools and religious (special uses) with exterior levels where L_{DN} > 60dBA.	45 dBA $\mathbf{L_{DN}}$ Interior
		N1.2.2 New Bldg. Design	Maximum exterior noise level created by new industrial and commercial uses.	65 dBA $\mathbf{L_{DN}}$ Exterior
		N1.2.3 Special Design	Maximum interior noise level where new uses create L_{DN} > 60dBA, requiring special design and construction.	45 dBA $\mathbf{L_{DN}}$ Interior
	N1.4 Minimize Exposure	N1.4.1. Vehicle Separation	Maximize distance between commercial or industrial vehicles and "noise sensitive" residential uses.	Maximize Distance
		N1.4.2 Residential Noise	Minimize noise impacts on residential parcels from adjacent commercial or industrial loading and shipping.	Shipping Activity Control
		N1.4.3 Shielding Residential Uses	Commercial or industrial parking lots abutting residential areas buffered and shielded with walls, fences or landscaping	Buffer/Shield Parking Lots
		N1.4.4 Impact On Adjacent	Commercial or industrial parking lots designed to minimize vehicle noise to adjacent land uses.	Control Vehicle Noise
		N1.4.5 Limit Hours Delivery	Limit hours of commercial and industrial truck deliveries on site and adjacent land uses.	Delivery Time Limits
	N1.6 Control Construct	N1.6.1 Limit Hours Construction	Regulate construction hours by enforcing existing and implementing noise ordinances.	Construct Time Limits
	N1.12 Analyze/ Mitigate	N1.12.1 Municipal Control	Ensure any approved land use having noise impact be adequately analyzed and mitigated.	Control Measures
		N1.12.2 Permit Control	Encourage stationary noise generating sources to reduce noise prior to renewing Conditional Use Permit	Permit Control

According to § 8.40.050 of the noise ordinance, the maximum exterior level that is considered acceptable for single family and mobile residential use, similar to those in the project area, is 55 dBA for daytime (7 am – 10 pm) and 50 dBA for nighttime (10 pm – 7 am). In addition, the city's Noise Ordinance, § 8.40.090(d) prohibits construction noise from 8 pm to 7 am on Mondays through Saturdays and all day Sundays and federal holidays. These restrictions apply to the project.

SETTING

The proposed HBEP project site would be located on a 28.6 acre site in a general use industrial area within Huntington Beach city limits at 21730 Newland Street. It would also be located within the existing AES Huntington Beach Generation Station (HBGS). HBEP would be bounded on the west by a mobile home park, by a tank farm on the north, by the Huntington Channel and residential neighborhoods on the east, by Magnolia Marsh Wetlands on the southeast, and by the Pacific Coast Highway on the southwest (HBEP 2012a, AFC §§ 2.0, 5.7.1).

HBEP would replace existing HBGS Units 1 through 4 and the decommissioned Unit 5. Units 3 and 4 have been converted from electric power production to synchronous condenser service. Units 1 through 4 would be replaced by Power Blocks 1 and 2 (PB-1 and PB-2). The demolition of Unit 5 and adjacent storage tanks would make room for PB-1. Then, the converted Units 3 and 4 would be decommissioned and demolished. PB-2 would then be constructed, and lastly HBGS Units 1 and 2 would be decommissioned and demolished. The proposed demolition and construction would take place over an approximate eight-year period.

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

METHODS AND THRESHOLDS FOR DETERMINING SIGNIFICANCE

California Environmental Quality Act

The California Environmental Quality Act (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.

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];
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[3] activities is limited to daytime hours.

Staff uses the above method and threshold to protect the most sensitive populations, including 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 residents are trying to sleep.

Ambient Noise Monitoring

In order to establish a baseline for the comparison of predicted project noise with existing ambient noise, the applicant presented the results of a long-term ambient noise survey conducted on September 19-21, 2012 (HBEP 2012u, Data Responses to Jason Pyle, Appendix B). This survey was performed using acceptable equipment and techniques. The noise survey monitored existing noise levels at the following four locations, shown in **Noise Figure 1**. A summary of the results are outlined in **Noise Table 3** below:

[2] For example, a noise level of 40 dBA would be considered quiet in many locations. A noise limit of 40 dBA would be consistent with the recommendations of the California Model Community Noise Control Ordinance for rural environments and with industrial noise regulations adopted by European jurisdictions. If the project would create an increase in ambient noise no greater than 10 dBA, the project noise level would not be significant if the resulting noise level does not exceed 40 dBA.

[3] Noise that draws legitimate complaints. For definition of "legitimate complaint", see the footnote in Condition of Certification **NOISE-2**.

Noise Table 3
Sensitive Receptor Summary

Receptor	Description	L_{eq}[4] dBA	L_{90}[5] dBA	Distance PB-1 (feet)	Distance PB-2 (feet)
M1	Gas Meter Station HB Generation Plant	N/A (not a sensitive residential receptor)	N/A (not a sensitive residential receptor)	1,500	500
M2	21851 Newland #48 Mobile Home Park	62	61	1,500	800
M3	22011 Hula Circle Residence	54	41	1,850	2,500
M4	8512 Sandy Hook Dr Residence	56	46	2,700	2,200

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 of the HBEP project is expected to be typical of similar projects in terms of equipment used and types of activities, but would have a longer than normal schedule of approximately 8 years (HBEP 2012a, AFC § 5.7.4.2). The 8-year construction of HBEP goes beyond what is normally considered temporary. Over the course of that time, various discrete activities would occur concurrently, creating a cumulative noise effect. Staff has identified that the phase when the demolition of existing Units 3 and 4 and the construction of PB-1 (Power Block 1) would occur in the two year period from 2016 to 2018 (Phase II) is the period when the noise levels are mostly likely to peak. See **Noise Table 4** below for project activities schedule.

Noise Table 4
Project Activities Schedule

Phase	I	II	III	IV
Unit 5/Tanks	Demo			
Unit 1 & 2				Demo
Unit 3 & 4		Demo		
PB-1		Construct		
PB-2			Construct	
Start Date	2014-Q4	2016-Q2	2018-Q2	2020-Q3

[4] Average value provided in long term measurements dated September 2012 (HBEP 2012u, Appendix A)

[5] Average of the 4-quiettest nighttime-hour measurements conducted in September 2012 (HBEP 2012u, Appendix A and Figure DR PYLE 7-1)

Compliance with LORS

Construction of an industrial facility such as a power plant is typically noisier than permissible under standard noise ordinances. In order to allow the construction of new facilities, construction noise during certain hours of the day is commonly exempt from enforcement by local ordinances. The applicable local noise LORS do not limit the loudness of construction noise, but staff compares the projected noise levels with ambient levels (please see the following discussion under **CEQA IMPACTS**).

The applicant commits to performing noisy construction work during the times specified in the City of Huntington Beach Noise Element (HBEP 2012a, AFC § 5.7.7.3.1). To ensure that this requirement is met, staff proposes Condition of Certification **NOISE-6**, which restricts construction to those times. Therefore, the noise impacts of the HBEP project construction activities would comply with the noise LORS.

CEQA Impacts

Since construction noise typically varies with time, it is most appropriately measured by, and compared with, the L_{eq} metric.

Staff has calculated the worst-case construction noise levels at the nearest residential receptors. They range between 57 and 64 dBA and are summarized below in **Noise Table 5**. These levels are from the loudest construction phase expected, when the schedules for the demolition of the existing Units 3 and 4 (on the southwestern portion of the site) and the construction of PB-1 (on the eastern portion of the site) would overlap (Phase II). During the other phases of construction, construction noise would be expected to be less. Staff has used this worst-case scenario to evaluate the construction impacts at the most noise-sensitive receptors.

Considering the long period of construction, as opposed to the temporary/short-term nature of a typical power plant construction, staff considers an increase of above 10 dBA due to construction to be significant at the HBEP's noise-sensitive receptors.

As seen in **Noise Table 5** below, the compounded construction noise of Units 3-4 demolition and PB-1 construction would increase noise levels at residential receptor M2 by 4 dBA, at M3 by 5 dBA, and at M4 by 4 dBA. The differential increases at all three locations would be less than significant (less than 10 dBA).

Noise Table 5
Predicted Construction Noise Levels

Receptor	Combined Construction Noise Level L_{eq} (dBA)[6]	Measured Ambient Avg. Daytime L_{eq} (dBA)[7]	Cumulative Noise Level (dBA)[8]	Change Noise Level (dBA)	Distance from Construction of PB-1 (feet)	Distance from Demolition of Units 3 & 4 (feet)
M2	64	62	66	+4	1,500	800
M3	58	54	59	+5	1,850	2,500
M4	57	56	60	+4	2,700	2,200

Note: See Noise Figure 1 for location.

To ensure construction noise would reduce the potential for noise complaints, staff proposes Condition of Certification **NOISE-6**, which restricts construction to daytime, with the exception of limited, short-term nighttime construction to be performed with the approval of the Energy Commission's compliance project manager. **NOISE-6** also requires construction equipment and trucks to avoid generating excessive and unnecessary noise.

Additionally, Condition of Certification **NOISE-8** requires pile driving be performed in a manner to reduce the potential for noise complaints (see analysis below under **VIBRATION**). Furthermore, Condition of Certification **NOISE-7** requires that a silencer be installed on the steam blow piping to reduce steam blow noise (see analysis below under **STEAM BLOWS**). Finally, staff proposes Conditions of Certification **NOISE-1** and **NOISE-2**, which would establish a public notification and noise complaint process to resolve any complaints regarding construction noise.

Examples of additional feasible mitigation measures are also listed in the City of Huntington Beach Noise Element (**Noise Table 2** and §§ I-N4 and I-N5 of the noise element), and the following:

- temporary and permanent noise barriers, such as a sound wall along the local street separating the affected receptors from the project site;
- reduction of speed limits; prohibition of "jake braking;"
- replacement and updating of equipment to current attenuation standards;
- moveable task noise barriers;
- disbursement of truck queues to distribute idling noise;
- reducing the number of noisy construction activities (pile driving, heavy equipment, steam blow) occurring simultaneously; and
- conducting noisy stationary construction activities in acoustically engineered enclosures and/or relocating construction staging areas to maximize their distances to the nearest noise-sensitive receptors.

[6] Staff calculated the value using construction noise level of 70 dBA at 375 feet for the demolition of Units 3 and 4 and the construction of Power Block 1 as coincident events during Period II as shown in **Noise Table 4** above.
[7] Daytime L_{eq} values derived from HBEP 2012u, Appendix A
[8] Cumulative Noise Levels are the summation of Combined Construction Noise Levels in the second column and the Measured Ambient values in the third column of **Noise Table 5**.

Linear Facilities

Linear facilities would include the existing 16-inch-diameter natural gas pipeline, an existing 8-inch-diameter supply water pipeline, and existing sewer and storm water pipelines. No new gas or water lines would be constructed. A new onsite electric transmission line would be constructed (HBEP 2012a, AFC §§ 2.1.1.1, 3.0, 4.0).

Construction of linear facilities typically moves along at a rapid pace, thus not subjecting any one receptor to noise impacts for more than two or three days. Further, construction activities would be limited to daytime hours. To ensure that these hours are, in fact, adhered to, in compliance with the LORS, staff proposes Condition of Certification **NOISE-6**.

Vibration

The only construction work likely to produce vibration that could be perceived off site would be pile driving. The applicant anticipates that pile driving would be required for construction of the HBEP project (HBEP 2012a, AFC §§ 5.7.4.2.2, 5.7.4.3.4, Table 5.7-9).

Pile driving could be expected to reach 104 dBA at a distance of 50 feet. The noise level from pile driving at HBEP would thus range from 73-78 dBA at receptor M2, 70-73 dBA at M3, and 71-74 dBA at M4.[9] Assuming daytime ambient noise levels of 62 dBA at M2, 54 dBA at M3, and 56 dBA at M4, the increased noise range would be as high as 16 dBA at M2, 19 dBA at M3, and 18 dBA at M4. An increase of 16-19 dBA would likely constitute a significant impact. Pile driving using traditional techniques can potentially cause a significant noise impact at the nearest noise-sensitive receptors. However, several methods are available for reducing noise and vibration generated by traditional pile driving. These methods are: (1) the use of pads or impact cushions of plywood; (2) dampened driving, which involves some form of blanket or enclosure around the hammer; and (3) the use of vibratory drivers. These methods can be effective in reducing the noise by 8-15 dBA as compared to unsilenced impact drivers.

To ensure that pile driving would be performed in a manner to reduce the potential for any noise complaints, staff proposes Condition of Certification **NOISE-8** (**Pile Driving Management**) below. Also to ensure that pile driving would be limited to daytime hours, staff proposes Condition of Certification **NOISE-6** (**Construction Noise Restrictions**) below.

Worker Effects

The applicant has acknowledged the need to protect construction workers from noise hazards and has recognized applicable LORS that would protect construction workers (HBEP 2012a, AFC §§ 5.7.4.2.3, 5.7.4.3.1, 5.7.7.1.2, 5.7.7.2.1). To ensure that construction workers are, in fact, adequately protected, staff proposes Condition of Certification **NOISE-3**.

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[9] Range for noise levels at pile-driving locales calculated by staff, based on a sound power level 104 dBA at 50 feet. See **Noise Table 5** for measured ambient daytime L_{eq} at M2-M4.

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 would amount to a range of 96-103 dBA at M2, M3 and M4. Steam blows could be very disturbing at the nearest noise-sensitive receptors, depending on the frequency, duration, and noise intensity of venting. With a silencer installed on the steam blow piping, noise levels are commonly attenuated to 89 dBA at 50 feet; steam blow would amount to a range of 59-63 dBA at M2, M3 and M4 (staff calculation). Although in excess of the ambient levels, these levels are acceptable, because the impact is temporary and steam blows would occur during the day. Thus, staff proposes Condition of Certification **NOISE-7** (below) in order to limit steam blow noise to 89 dBA at 50 feet, and to limit this activity to daytime hours.

A quieter steam blow process, referred to as “low pressure steam blow” and marketed under names such as QuietBlow™ or Silentsteam™, 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.

Traffic Noise during Construction

The number of vehicles required for material delivery and worker commute would increase the traffic on the roadway network around the project. The increased traffic is summarized in **Traffic and Transportation Table 4** in the **TRAFFIC AND TRANSPORTATION** section of this Staff Assessment. With one exception, the average daily traffic (ADT) in the roadway network contiguous to the project site would increase by approximately 1 percent as a result of construction activities. The single exception is Newland Avenue between Adams and Indianapolis, where traffic volume would increase by approximately 6 percent.

The roadway network around HBEP comprises surface streets with speed limits that are 45 mph or less. The most southerly element of this rectangular network is the State Route 1 Pacific Coast Highway (PCH) with a 41,000 ADT and a 50 mph speed limit (see **Noise Figure 1**). The northerly portion of this street network is Interstate 405 (San Diego Freeway), an elevated interstate, which connects to PCH with a north-south street grid, starting with Beach Boulevard in the west, followed by Newland, Magnolia and Brockhurst. North of the project site running west to east is Hamilton, followed by Atlanta, Indianapolis, Adams, Yorktown, Garfield, and Ellis, all with 45 mph speed limits. According to AFC Table 5.12-7, the current traffic densities near the project site range from 9,000 to 12,000 ADT, fed by Hamilton (17,000), and increase as you move north toward Interstate 405, where traffic increases to the 17,000-30,000 ADT range.

The additional traffic propagated by project construction activity would center on the 4.5 acres (430 stalls) of onsite and contiguous parking for project workers and deliveries to and from the 8 acres of lay-down area. The balance of parking would be provided by 485 public parking spaces along the PCH. Additional 16 acres at the AES Los Alamitos facility a few miles north along PCH would provide the balance of the lay-down area. The onsite lay-down and parking areas would be the terminus for project deliveries and the workers' morning commute. The peak hour traffic volumes for construction workers are identified below:

- 52 vehicles turning into Newland Street from northbound PCH
- 35 vehicles turning into Newland Street from southbound PCH
- 116 vehicles feeding Newland Street from Hamilton
- 133 vehicles feeding Newland street from north of Hamilton

As a result, Newland Street would act as the artery where the morning commute would terminate for project workers and daytime deliveries and the departing point for the evening homebound commute. The intersection of Newland and Hamilton would experience a considerable increase in traffic volume during the short period before the start of construction each day, prior to 7 a.m. Without proper mitigation, this may result in noise complaints from the nearest residents, considering it would occur in early morning. However, the residential communities near this intersection have already received sound attenuation by means of existing sound walls along the sidewalk setbacks. The single story houses northeast of the intersection of Newland and Hamilton are protected with masonry sound walls approximately eight feet in height. The two-story residences northwest of this intersection have higher walls designed to protect the taller structures. Staff concludes that these existing masonry walls would provide adequate acoustical protection from the escalated traffic converging on the construction site.

Operation Impacts and Mitigation

The primary noise sources of the HBEP project, when operational, would include engine generators and their exhaust stacks, combustion air inlets, gas compressor, air-cooled condensers (ACCs), electric transformers, and various pumps and fans. Staff compares the projected project noise with applicable LORS, in this case the City of Huntington Beach LORS. In addition, staff evaluates any increase in noise levels at sensitive receptors due to the project in order to identify any significant adverse impacts.

Applicant-proposed noise mitigation measures include the following (HBEP 2012a, AFC § 5.7.4.3.3; HBEP 2012u, Data Response 2):

- heat recovery steam generator (HRSG) stack silencing;
- inlet air silencing;
- gas compressor enclosure;
- acoustical shrouding of HRSG transition duct;
- combustion turbine generator auxiliary enclosure; and
- localized sound walls.

In addition, the project would avoid the creation of annoying tonal (pure-tone) noises by balancing the noise emissions of various power plant features during plant design (HBEP 2012a, AFC § 5.7.4.3.3).

Compliance with LORS

The applicant performed noise modeling to determine the project's noise impacts on sensitive receptors (HBEP 2012u, Figure DR PYLE 6-1). The summary of this modeling is in **Noise Table 6** below. The LORS maximum exterior level that is considered acceptable for single family and mobile residential use, similar to those in the project area, is 55 dBA for daytime (7 a.m. – 10 p.m.) and 50 dBA for nighttime (10 p.m. – 7 a.m.).

Noise Table 6
Predicted Operational Noise Levels at Sensitive Residential Receptors and LORS Limits

Receptor	Operational Noise Level (dBA)[10]	LORS Limit (dBA), Daytime	LORS Limit (dBA), Nighttime	In excess of Daytime LORS (dBA)	In excess of Nighttime LORS (dBA)	In Compliance with LORS?	Distance Power Block 1 (PB-1) (feet)	Distance Power Block 2 (PB-2) (feet)
M2	61	62[11]	62[11]	-1	-1	Yes	1,800	1,000
M3	45	55	50	-10	-5	Yes	1,850	2,500
M4	49	55	50	-6	-1	Yes	2,350	1,100

[10] Table DR PYLE 6-1, Additional Responses to Jason Pyle's Data Requests, Set 1 (#1-16)
[11] From **Noise Table 3**

As shown in **Noise Table 6**, the cumulative effect of operational noise from PB-1 and PB-2 yield a cumulative noise level of 61 dBA at M2, 45 dBA at M3, and 49 dBA at M4. Because the cumulative noise levels for M3 and M4 fall below the most stringent limit, the nighttime limit of 50 dBA in the local noise ordinance (see **Noise Table 6**), and comply with the noise element's maximum exterior noise level of 65 dBA L_{DN} (equivalent to 58 dBA for a constant L_{eq} level) allowed for new industrial and commercial uses, the LORS limits are met at these locations.

At first glance, one might conclude that similar to M3 and M4 the operational noise level of 61 dBA at M2 must drop also to 55 dBA between 7 a.m. and 10 p.m. and to 50 dBA between 10 p.m. and 7 a.m. in order to comply with the LORS. But, the existing ambient level at M2, or 62 dBA L_{eq} (see **Noise Table 6**), already exceeds these prescribed limits. This existing level, then, becomes the standard at the M2 location. Thus, project operation at M2 must not create a noise level above 62 dBA L_{eq} (see **Noise Table 6**). As seen in **Noise Table 6**, project noise would be 61 dBA at M2, 1 dBA below this limit.

To ensure that the project would comply with the above noise level limits, staff proposes Condition of Certification **NOISE-4**. This condition of certification requires an operational noise survey to ensure project compliance. This survey would be conducted in two parts. Part 1 would measure project noise when PB-1 becomes operational and Part 2 would measure the combined noise levels from PB-1 and PB-2 when PB-2 becomes operational, almost three years later. The reason for this two-part survey is the long timeframe between the expected online dates for PB-1 and PB-2. It would ensure that PB-1 remains in compliance within that timeframe instead of waiting until the entire project becomes fully operational.

Similar to construction compliance, and in addition to **NOISE-4**, staff proposes Conditions of Certification **NOISE-1** and **NOISE-2**, which would establish a public notification and noise complaint process requiring the applicant to resolve any problems that may be caused by operational noise.

With implementation of these conditions of certification, noise due to project operation would comply with the applicable LORS.

CEQA Impacts

Power plant noise is unique. A power plant under base load 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. This would be more noticeable at nighttime when background noises are particularly low. Where power plant noise is audible, it tends to define the background noise level. For this reason, staff typically compares projected power plant noise to existing ambient background (L_{90}) 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.

In many cases, a power plant operates around the clock for much of the year. HBEP is expected to operate as an intermediate load and peaking facility, and thus, it could likely operate at night, which could affect nearby residences if the noise impacts are left unmitigated. For residential receptors, staff evaluates project noise emissions by comparing them with nighttime ambient background levels; this evaluation assumes that the potential for public nuisance from power plant noise is greatest at night when residents are trying to sleep. Nighttime ambient noise levels are typically lower than daytime levels; differences in background noise levels of 5 to 10 dBA are common. Staff believes it is prudent to average the lowest nighttime hourly background noise levels in terms of the L_{90} metric (the noise level that's exceeded 90 percent of the time) to arrive at a reasonable baseline for comparison with the project's predicted noise level.

Adverse impacts on residential receptors can be identified by comparing predicted power plant noise levels with the nighttime ambient background noise levels at the nearest sensitive residential receptors.

The applicant has predicted operational noise levels, which are summarized in **Noise Table 7** below.

Noise Table 7
Predicted Operational Noise Levels at Sensitive Residential Receptors and CEQA Limits

Receptor	Measured Ambient, Four Quietest Consecutive Nighttime Hours, L_{90} (dBA)[12]	Operational Noise Level (dBA)[13]	Cumulative, Project Plus Ambient (dBA)	Change (dBA)
M2	61	61	64	+3
M3	41	45	46	+5
M4	46	49	51	+5

Staff regards an increase of up to 5 dBA as a less-than-significant impact (see **METHOD AND THRESHOLD FOR DETERMINING SIGNIFICANCE** above). In the M2 row of **Noise Table 7**, combining the ambient noise level of 61 dBA L_{90} with the project noise level of 61 dBA would yield a cumulative value of 64 dBA, 3 dBA above the ambient at M2; this results in a less-than-significant impact.

For M3, the 41 dBA L_{90} and 45 dBA plant level accumulates to 46 dBA L_{90} for a 5 dBA increase above ambient; not a significant impact. M4 background measured at 46 dBA L_{90} at 49 dBA plant level yields 51 dBA at M4 for a 5 dBA increase above the ambient; not a significant impact.

Staff proposes Condition of Certification **NOISE-4** to ensure that the changes in noise levels due to project operation would neither cause the cumulative effect of operational noise to exceed the LORS limits nor increase noise above the 5 dBA differential at the nearest sensitive receptors.

[12] Average of the 4-quiettest nighttime-hour measurements conducted in September 2012 (HBEP 2012u, Appendix A and Figure DR PYLE 7-1)
[13] Table DR PYLE 6-1, Additional Responses to Jason Pyle's Data Requests, Set 1 (#1-16)

Tonal Noises

One possible source of nuisance could be strong tonal noises. Tonal noises are individual sounds (such as pure tones) which, while not louder than permissible levels, stand out in sound quality. The applicant plans to address overall noise in project design, and to take appropriate measures, as needed, to eliminate tonal noises as possible sources of complaints (HBEP 2012a, AFC § 5.7.4.3.3). To ensure that tonal noises do not cause nuisance, staff proposes Condition of Certification **NOISE-4**, which would require mitigation measures, if necessary, to ensure the project would not create tonal noises.

Linear Facilities

All water pipes and gas pipes would be underground and therefore silent during plant operation. Noise effects from electrical interconnection lines typically do not extend beyond the lines' right-of-way easements and would be inaudible to receptors.

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 three-on-one combined cycle power plant consist of high-speed gas turbines, heat recovery steam generators, 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 Mitsubishi MHI 501 system have not resulted in ground-borne or airborne vibration impacts. Staff agrees with the applicant that ground-borne vibration from the HBEP project would be undetectable by any likely receptor.

Airborne vibration (low frequency noise) can rattle windows and objects on shelves, and can rattle the walls of lightweight structures. The HBEP's chief source of airborne vibration would be the gas turbines' exhaust. In a power plant such as the HBEP, 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 HBEP would cause perceptible airborne vibration effects.

Worker Effects

The applicant acknowledges the need to protect plant operating and maintenance workers from noise hazards and commits to compliance with all applicable LORS (HBEP 2012a, AFC § 5.7.7). 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 and provided. To ensure that plant operation and maintenance workers are adequately protected, staff has proposed Condition of Certification **NOISE-5**. For further discussion of proposed worker safety conditions of certification, please see **WORKER SAFETY AND FIRE PROTECTION** section of this document.

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.

There is one major planned project in the area that when combined with HBEP could create a significant adverse noise impact at M2-M4; the Poseidon Seawater Desalination Project (Poseidon) planned to be located immediately northeast of HBEP. Poseidon is designed to provide 50 million gallons per day (mgd) of potable water to the City of Huntington Beach and adjacent municipalities. As currently proposed, Poseidon would utilize the existing HBGS seawater cooling system by circulating sea water from the existing intake and sending it through water treatment for potable use. Excess concentrated seawater solution from the treatment process would combine with bypassed seawater, diluting the seawater concentrate before the combined flow discharges back to sea from the existing ocean outfall.

Construction

As a means of enforcement of construction-related mitigation measures, the Poseidon environmental impact report incorporates condition **CON-15**, which includes the requirement for adequate mufflers on vehicles, compliance with the City's noise ordinance, the use of temporary barriers, and routing control of construction vehicles.

At the same time HBEP would require a number of conditions of certification, which would assure the effective control of construction noise:

- **NOISE-2**: Noise complaint, documentation and resolution.
- **NOISE-6**: Noise control of construction activities.
- **NOISE-7**: Steam blow control.
- **NOISE-8**: Noise control during pile driving activities.

Staff recognizes that various construction activities of the two projects might be concomitant, terminating in the coincident operation of HBEP and Poseidon. Nevertheless, staff concludes that both projects would incorporate adequate restrictions and controls to handle any combination of construction activities which would generate noise.

Operation

Condition of Certification **NOISE-4** limits nighttime operational noise levels resulting from HBEP alone to 61 dBA at M2, 45 dBA at M3, and 49 dBA at M4. The Final Subsequent Environmental Impact Report for Poseidon (City of Huntington Beach 2010, Table N-13) predicts the noise levels from the Poseidon's operational activities to be 49 dBA near M2, 41 dBA near M3, and 43 dBA near M4 (see **Noise Table 8** below).

Noise Table 8
Cumulative Noise Levels at Sensitive Residential Receptors

Receptor	Measured Ambient, Four Quietest Consecutive Nighttime Hours, L_{90} (dBA)[14]	Operational Noise Level (dBA) from HBEP	Operational Noise Level (dBA) from Poseidon	Cumulative from Both Projects (dBA)	Change (dBA)
M2	61	61	49	61	0
M3	41	45	41	46	+5
M4	46	49	43	50	+4

Combining 61 dBA and 49 dBA at M2 results in 61 dBA, which does not affect the existing ambient level (See **Noise Table 8** below). Combining 45 dBA and 41 dBA at M3 results in 46 dBA, which is 5 dBA above the existing ambient level (See **Noise Table 8**). Combining 49 dBA and 43 dBA at M4 results in 50 dBA, which is 4 dBA above the existing ambient level (See **Noise Table 8**).

Staff considers an increase of up to 5 dBA to be less-than-significant. Therefore, HBEP would create a less-than-significant cumulative impact.

FACILITY CLOSURE

All operational noise from the project would cease when the HBEP 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 Energy Commission decision would also apply.

RESPONSE TO PUBLIC AND AGENCY COMMENTS

As of the publication of the Final Staff Assessment, staff has not received any public or agency comments regarding noise and vibration issues.

CONCLUSIONS

If built and operated in conformance with the proposed conditions of certification, staff believes that HBEP would comply with all applicable noise and vibration LORS. 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 minority populations, directly, indirectly, or cumulatively. Staff further concludes that conditions requiring ongoing measurement, feedback and resolution, particularly those under **NOISE-4**, ensure the newly configured power facility would be acoustically compatible with nearby residential neighborhoods and public access areas.

[14] Average of the 4-quiettest nighttime-hour measurements conducted in September 2012 (HBEP 2012u, Appendix A and Figure DR PYLE 7-1)

PROPOSED CONDITIONS OF CERTIFICATION

PUBLIC NOTIFICATION PROCESS

NOISE-1 Prior to the start of ground disturbance, the project owner shall notify all residents within one mile of the project site and one-half mile of the linear facilities, by mail or by other effective means, of the commencement of project construction. At the same time, the project owner shall establish a telephone number for use by the public to report any undesirable noise conditions associated with the construction and operation of the project. If the telephone is not staffed 24 hours a day, the project owner shall include an automatic answering feature, with date and time stamp recording, to answer calls when the phone is unattended. This, or a similarly effective telephone number, shall be posted at the project site during construction where it is visible to passersby. This telephone number shall be maintained until the project has been operational for at least one year.

Verification: At least 15 days prior to ground disturbance, the project owner shall transmit to the compliance project manager (CPM) a statement, signed by the project owner's project manager, stating that the above notification has been performed, and describing the method of that notification. This communication shall also verify that the telephone number has been established and posted at the site, and shall provide that telephone number.

NOISE COMPLAINT PROCESS

NOISE-2 Throughout the construction and operation of the project, the project owner shall document, investigate, evaluate, and attempt to resolve all legitimate project-related noise complaints[15]. The project owner or authorized agent shall:

- use the Noise Complaint Resolution Form (below), or a functionally equivalent procedure acceptable to the CPM, to document and respond to each project-related noise complaint;
- attempt to contact the person(s) making the noise complaint within 24 hours;
- conduct an investigation to determine the source of noise in the complaint;
- if the noise is project related, take all feasible measures to reduce the source of the noise; and
- submit a report documenting the complaint and actions taken. The report shall include: a complaint summary, including the final results of noise reduction efforts and, if obtainable, a signed statement by the complainant that states that the noise problem has been resolved to the complainant's satisfaction.

[15] A legitimate complaint refers to a complaint about noise that is caused by the HBEP project as opposed to another source (as verified by the CPM). A legitimate complaint constitutes a violation by the project of any noise condition of certification (as confirmed by the CPM), which is documented by an individual or entity affected by such noise.

Verification: Within five days of receiving a noise complaint, the project owner shall file with the CPM a Noise Complaint Resolution Form, shown below, that documents the resolution of the complaint. If mitigation is required to resolve the complaint, and the complaint is not resolved within a three business-day period, the project owner shall submit an updated Noise Complaint Resolution Form when the mitigation is implemented.

EMPLOYEE NOISE CONTROL PROGRAM

NOISE-3 The project owner shall submit to the CPM for review and approval a noise control program. The noise control program shall be used to reduce employee exposure to high (above permissible) noise levels during construction in accordance to the applicable OSHA and Cal-OSHA standards.

Verification: At least 30 days prior to the start of ground disturbance, the project owner shall submit the noise control program to the CPM. The project owner shall make the program available to Cal-OSHA upon request.

NOISE RESTRICTIONS

NOISE-4 The project design and implementation shall include appropriate noise mitigation measures adequate to ensure that the operation of the project will not cause the noise levels due to normal steady-state plant operation alone, to exceed an hourly average of 61 dBA L_{eq}, measured at or near monitoring location M2.

Also, the project design and implementation shall include appropriate noise mitigation measures adequate to ensure that the operation of the project will not cause the noise levels due to plant operation alone, during the four quietest consecutive hours of the nighttime, to exceed an average of 45 dBA L_{90} measured at or near monitoring location M3 and an average of 49 dBA L_{90} measured at or near monitoring location M4.

No new pure-tone components (as defined in **Noise Table A1**) shall be caused by the project. No single piece of equipment shall be allowed to stand out as a source of noise that draws legitimate complaints[16].

When the project first achieves a sustained output of 85 percent or greater of its rated capacity, the project owner shall conduct a 25-hour community noise survey at monitoring locations M2, M3 and M4, or at a closer location acceptable to the CPM and include L_{eq} and L_{90} readings. This survey shall also include measurement of one-third octave band sound pressure levels to ensure that no new pure-tone noise components have been caused by the project.

[16] A legitimate complaint refers to a complaint about noise that is caused by the HBEP project as opposed to another source (as verified by the CPM). A legitimate complaint constitutes a violation by the project of any noise condition of certification (as confirmed by the CPM), which is documented by an individual or entity affected by such noise.

The measurement of power plant noise for the purposes of demonstrating compliance with this condition of certification may alternatively be made at a location, acceptable to the CPM, closer to the plant (e.g., 400 feet from the plant boundary) and this measured level then mathematically extrapolated to determine the plant noise contribution at the affected residence. The character of the plant noise shall be evaluated at the affected receptor locations to determine the presence of pure tones or other dominant sources of plant noise.

If the results from the noise survey indicate that the power plant noise at the affected receptor sites exceed the above values, mitigation measures shall be implemented to reduce noise to a level of compliance with these limits.

If the results from the noise survey indicate that pure tones are present, mitigation measures shall be implemented to reduce the pure tones to a level that complies with **Noise Table A1**, below.

Verification: The above noise survey shall be conducted in two parts. Part one shall take place within 90 days of Power Block 1 (PB-1) first achieving a sustained output of 85 percent or greater of its rated capacity. Part 2 of this survey shall be performed within 90 days of Power Block 2 (PB-2) first achieving 85 percent or greater of its rated capacity and shall include the combined operation of PB-1 and PB-2 at 85 percent or greater of the overall plant rated capacity with all turbine generators operating. The exception to the above is that for the daytime portions of the survey only (between 7:00 a.m. and 10:00 p.m.) the above rated capacity can be 80 percent or higher rather than 85 percent or higher.

Within 15 days after completing each part, the project owner shall submit a summary report to the CPM. Included in the survey report shall be a description of any additional mitigation measures necessary to achieve compliance with the above listed noise limits, and a schedule, subject to CPM approval, for implementing these measures. When these measures are implemented and in place, the project owner shall repeat the noise survey.

Within 15 days of completion of the new survey, the project owner shall submit to the CPM a summary report of the new noise survey, performed as described above and showing compliance with this condition.

OCCUPATIONAL NOISE SURVEY

NOISE-5 Following PB-1's attainment of a sustained output of 90 percent or greater of its rated capacity, the project owner shall conduct an occupational noise survey to identify any noise hazardous areas in the facility. Following PB-2's attainment of a sustained output of 90 percent or greater of its rated capacity, the project owner shall repeat this survey.

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 to be employed in order to comply with the applicable California and federal regulations.

Verification: Within 30 days after completing each survey, the project owner shall submit the noise survey report to the CPM. The project owner shall make the report available to OSHA and Cal-OSHA upon request from OSHA and Cal-OSHA.

CONSTRUCTION RESTRICTIONS

NOISE-6 Heavy equipment operation and noisy[17] construction work relating to any project features, including pile driving, shall be restricted to the times delineated below:

Mondays through Saturdays:	7:00 a.m. to 8:00 p.m.
Sundays and Federal Holidays:	Construction not allowed

Limited construction activities may be performed outside of the above hours, with CPM approval.

Haul trucks and other engine-powered equipment shall be equipped with adequate mufflers and other state-required noise attenuation devices. Haul trucks shall be operated in accordance with posted speed limits. Truck engine exhaust brake use (jake braking) shall be limited to emergencies.

Verification: Prior to ground disturbance, the project owner shall transmit to the CPM a statement acknowledging that the above restrictions will be observed throughout the construction of the project.

In consultation with the CPM, construction equipment generating excessive noise[18] shall be updated or replaced if beneficial in reducing the noise and if feasible. In addition, temporary acoustic barriers shall be installed around stationary construction noise sources if beneficial in reducing the noise and if feasible. The project owner shall reorient construction equipment, and relocate construction staging areas, when possible, to minimize the noise impact at nearest noise-sensitive receptors.

At least 15 days prior to working outside of the above hours, the project owner shall submit a statement to the CPM, specifying the time of night and the number of nights for which activities will occur, the approximate distance of activities to residential receptors, and the expected sound levels at these receptors, stating that the activities will be performed in a manner to ensure excessive noise is prohibited as much as practicable.

[17] Noise that draws legitimate complaint (for the definition of “legitimate complaint”, see the footnote in Condition of Certification **NOISE-2**)

[18] Noise that draws a legitimate complaint (for the definition of “legitimate complaint”, see the footnote in Condition of Certification **NOISE-2**)

STEAM BLOW RESTRICTIONS

NOISE-7 If a traditional, high-pressure steam blow process is used the project owner shall equip steam blow piping with a temporary silencer that quiets the noise of steam blows to no greater than 89 dBA measured at a distance of 50 feet. The steam blows shall be conducted between 8:00 a.m. and 5:00 p.m. If a low-pressure, continuous steam blow process is used, the project owner shall submit to the CPM a description of the process, with expected noise levels and planned hours of steam blow operation.

Verification: At least 15 days prior to the first steam blow, the project owner shall notify all residents or business owners within one mile of the project site boundary. The notification may be in the form of letters, phone calls, fliers, or other effective means, as approved by the CPM. The notification shall include a description of the purpose and nature of the steam blow(s), the planned schedule, expected sound levels, and explanation that it is a one-time activity and not part of normal plant operation.

PILE DRIVING MANAGEMENT

NOISE-8 The project owner shall perform pile driving in a manner to reduce the potential for any legitimate noise complaints. The project owner shall notify the residents in the vicinity of pile driving prior to start of pile driving activities.

Verification: At least 15 days prior to first pile driving, the project owner shall submit to the CPM a description of the pile driving technique to be employed, including calculations showing its projected noise impacts at monitoring locations M2-M4.

At least 10 days prior to first production pile driving, the project owner shall notify the residents within one-half mile of the pile driving. In this notification, the project owner shall state that it will perform this activity in a manner to reduce the potential for any legitimate noise complaints, as much as practicable. The project owner shall submit a copy of this notification to the CPM prior to the start of pile driving.

EXHIBIT 1 - NOISE COMPLAINT RESOLUTION FORM

Huntington Beach Energy Project
(12-AFC-2)

NOISE COMPLAINT LOG NUMBER ________________________

Complainant's name and address:

Phone number: ________________________

Date complaint received: ________________________
Time complaint received: ________________________

Nature of noise complaint:

Definition of problem after investigation by plant personnel:

Date complainant first contacted: ________________________

Initial noise levels at 3 feet from noise source _________ dBA Date: _____________

Initial noise levels at complainant's property: __________ dBA Date: ____________

Final noise levels at 3 feet from noise source: ________ dBA Date: _____________

Final noise levels at complainant's property: __________ dBA Date: ____________

Description of corrective measures taken:

Complainant's signature: ________________________ Date: ____________

Approximate installed cost of corrective measures: $ ____________
Date installation completed: ____________
Date first letter sent to complainant: ____________ (copy attached)
Date final letter sent to complainant: ____________ (copy attached)

This information is certified to be correct:

Plant Manager's Signature: ________________________

(Attach additional pages and supporting documentation, as required).

REFERENCES

City of Huntington Beach 1996 – City of Huntington Beach General Plan, Noise Element

City of Huntington Beach 2012 – City of Huntington Beach Municipal Code, Noise Ordinance, Chapter 8.40, Noise Control

City of Huntington Beach 2010 – Final Subsequent Environmental Impact Report for Poseidon Seawater Desalination Project, August 23, 2010

Effects of Noise on People, U.S. Environmental Protection Agency, December 31, 1971

HBEP 2012a – (tn 66003) Huntington Beach Energy Project, submitted by AES. Application for Certification, Volumes 1 & 2, dated June, 2012

HBEP 2012u – Stoel Rives LLP / Melissa A. Foster (tn 68876). *Applicant's Responses to Intervenor Jason Pyle's Data Requests, Set 1 (#1-16), dated December 13, 2012.* Submitted to CEC/ Dockets on December 13, 2012

Kryter, Karl D., The Effects of Noise on Man, 1970

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	
Pile Driver (50')	100		
Ambulance Siren (100')	90	Boiler Room	
Freight Cars (50')	85		
Pneumatic Drill (50')	80	Printing Press Kitchen with Garbage Disposal Running	Loud
Freeway (100')	70		Moderately Loud
Vacuum Cleaner (100')	60	Data Processing Center Department Store/Office	
Light Traffic (100')	50	Private Business Office	
Large Transformer (200')	40		Quiet
Soft Whisper (5')	30	Quiet Bedroom	
	20	Recording Studio	
	10		Threshold of Hearing
Source: Handbook of Noise Measurement, Arnold P.G. Peterson, 1980			

Subjective Response to Noise

The adverse effects of noise on people can be classified into three general categories:

- Subjective effects of annoyance, nuisance, dissatisfaction.
- Interference with activities such as speech, sleep, and learning.
- Physiological effects such as anxiety or hearing loss.

The sound levels associated with environmental noise, in almost every case, produce effects only in the first two categories. Workers in industrial plants can experience noise effects in the last category. There is no completely satisfactory way to measure the subjective effects of noise, or of the corresponding reactions of annoyance and dissatisfaction, primarily because of the wide variation in individual tolerance of noise.

One way to determine a person's subjective reaction to a new noise is to compare the level of the existing (background) noise, to which one has become accustomed, with the level of the new noise. In general, the more the level or the tonal variations of a new noise exceed the previously existing ambient noise level or tonal quality, the less acceptable the new noise will be, as judged by the exposed individual.

With regard to increases in A-weighted noise levels, knowledge of the following relationships can be helpful in understanding the significance of human exposure to noise.

1. Except under special conditions, a change in sound level of one dB cannot be perceived.

2. Outside of the laboratory, a three dB change is considered a barely noticeable difference.

3. A change in level of at least five dB is required before any noticeable change in community response would be expected.

4. A ten dB change is subjectively heard as an approximate doubling in loudness and almost always causes an adverse community response. (Kryter, Karl D., The Effects of Noise on Man, 1970).

Combination of Sound Levels

People perceive both the level and frequency of sound in a non-linear way. A doubling of sound energy (for instance, from two identical automobiles passing simultaneously) creates a three dB increase (i.e., the resultant sound level is the sound level from a single passing automobile plus three dB). The rules for decibel addition used in community noise prediction are:

Noise Table A3
Addition of Decibel Values

When two decibel values differ by:	Add the following amount to the larger value
0 to 1 dB	3 dB
2 to 3 dB	2 dB
4 to 9 dB	1 dB
10 dB or more	0
Figures in this table are accurate to ± 1 dB.	

Source: Architectural Acoustics, M. David Egan, 1988

Sound and Distance

Doubling the distance from a noise source reduces the sound pressure level by six dB.

Increasing the distance from a noise source 10 times reduces the sound pressure level by 20 dB.

Worker Protection

OSHA noise regulations are designed to protect workers against the effects of noise exposure, and list permissible noise level exposure as a function of the amount of time to which the worker is exposed:

Noise Table A4
OSHA Worker Noise Exposure Standards

Duration of Noise (Hrs/day)	A-Weighted Noise Level (dBA)
8.0	90
6.0	92
4.0	95
3.0	97
2.0	100
1.5	102
1.0	105
0.5	110
0.25	115

Source: 29 C.F.R. § 1910.

PUBLIC HEALTH

Testimony of Huei-An (Ann) Chu, Ph.D.

SUMMARY OF CONCLUSIONS

California Energy Commission staff has analyzed the potential human health risks associated with construction, demolition and operation of the proposed Huntington Beach Energy Project (HBEP). Staff's analysis of potential health impacts was based on a highly conservative health protective methodology that accounts for impacts to the most sensitive individuals in a given population. Staff concludes that there would be no significant health impacts from the project's air emissions.

INTRODUCTION

The purpose of this Final Staff Assessment (FSA) is to determine if emissions of toxic air contaminants (TACs) from the proposed HBEP would have the potential to cause significant adverse public health impacts or to violate standards for the protection of public health. If potentially significant health impacts are identified, staff would identify and recommend mitigation measures necessary to reduce such impacts to insignificant levels.

In addition to the analysis contained in this **PUBLIC HEALTH** section that focuses on potential effects to the public from emissions of toxic air contaminants, Energy Commission staff address the potential impacts of regulated, or criteria, air pollutants in the **AIR QUALITY** section of this FSA, and assess the impacts on public and off-site worker health from accidental releases of hazardous materials in the **HAZARDOUS MATERIALS MANAGEMENT** and **WORKER SAFETY AND FIRE PROTECTION** sections. The health and nuisance effects from electric and magnetic fields are discussed in the **TRANSMISSION LINE SAFETY AND NUISANCE** section. Pollutants released from the project's wastewater streams are discussed in the **SOIL AND SURFACE WATER** and **WATER SUPPLY** sections. Releases in the form of hazardous and nonhazardous wastes are described in the **WASTE MANAGEMENT** section.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS (LORS)

Public Health Table 1 lists the federal, state, and local laws and policies applicable to the control of TAC emissions and mitigation of public health impacts for HBEP. This section evaluates compliance with these requirements and summarizes the applicable laws, ordinances, regulations and standards (LORS).

Public Health Table 1
Laws, Ordinances, Regulations, and Standards (LORS)

Applicable LORS	Description
Federal	
Clean Air Act section 112 (Title 42, U.S. Code section 7412)	Section 112 of the Clean Air Act addresses emissions of hazardous air pollutants (HAPs). This act requires new sources that emit more than 10 tons per year of any specified HAP or more than 25 tons per year of any combination of HAPs to apply Maximum Achievable Control Technology (MACT).
40 Code of Federal Regulations (CFR) Part 63 Subpart YYYY (National Emission Standard for Hazardous Air Pollutants for Stationary Combustion Turbines)	This regulation applies to gas turbines located at major sources of HAP emissions. A major source is defined as a facility with emissions of 10 tons per year (tpy) or more of a single HAP or 25 tpy or more of a combination of HAPs based on the potential to emit.
40 Code of Federal Regulations (CFR) Part 68 (Risk Management Plan)	This rule requires facilities storing or handling significant amounts of acutely hazardous materials to prepare and submit Risk Management Plans.
State	
California Health and Safety Code section 25249.5 et seq. (Proposition 65)	These sections establish thresholds of exposure to carcinogenic substances above which Proposition 65 exposure warnings are required.
California Health and Safety Code, Article 2, Chapter 6.95, Sections 25531 to 25541; California Code of Regulations (CCR) Title 19 (Public Safety), Division 2 (Office of Emergency Services), Chapter 4.5 (California Accidental Release Prevention Program)	These regulations require facilities storing or handling significant amounts of acutely hazardous materials to prepare and submit Risk Management Plans.
California Health and Safety Code section 41700	This section states that “no person shall discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or which endanger the comfort, repose, health, or safety of any such persons or the public, or which cause, or have a natural tendency to cause injury or damage to business or property.”
California Health and Safety Code Sections 44300 et seq.	Air Toxics Hot Spots Program requires participation in the inventory and reporting program at the local air pollution control district level.
California Health and Safety Code Sections 44360 to 44366 (Air Toxics “Hot Spots” Information and Assessment Act—AB 2588)	This act requires that based on results of a health risk assessment (HRA) conducted per ARB (California Air Resources Board) / OEHHA (Office of Environmental Health Hazard Assessment) guidelines, toxic contaminants do not exceed acceptable levels.
California Public Resource Code section 25523(a); Title 20 California Code of Regulations (CCR) section 1752.5, 2300–2309 and Division 2 Chapter 5, Article 1, Appendix B, Part (1); California Clean Air Act, Health and Safety Code section 39650, et seq.	These laws and regulations require a quantitative health risk assessment for new or modified sources, including power plants that emit one or more toxic air contaminants (TACs).
Local	
SCAQMD Rule 1401 (New Source Review of Toxic Air Contaminants)	This rule specifies limits for maximum individual cancer risk (MICR), cancer burden, and noncancer acute and chronic hazard index (HI) from new permit units, relocations, or modifications to existing permit units which emit toxic air contaminants (TACs).

Applicable LORS	Description
SCAQMD Rule 1403 (Asbestos Emissions from Demolition/Renovation Activities)	This rule specifies work practice requirements to limit asbestos emissions from building demolition and renovation activities, including the removal and associated disturbance of asbestos-containing materials.
SCAQMD Rule 212(c)(3) (Permits – Public Notice)	This rule requires public notification if the maximum individual cancer risk (MICR), based on Rule 1401, exceeds one in 1 million (1×10^{-6}), due to a project's proposed construction, modification, or relocation for facilities with more than one permitted source unless the applicant can show the total facility-wide MICR is below 10 in 1 million (10×10^{-6}).

SETTING

This section describes the environment in the vicinity of the proposed project site from a public health perspective. Characteristics of the natural environment, such as meteorology and terrain, affect the project's potential for impacts on public health. An emission plume from a facility would affect elevated areas before lower terrain areas because of reduced opportunity for atmospheric mixing. Consequently, areas of elevated terrain can often be subjected to increased pollutant impacts compared to lower-level areas. Also, the land use around a project site can influence impacts due to population distribution and density, which, in turn, can affect public exposure to project emissions. Additional factors affecting potential public health impacts include existing air quality and environmental site contamination.

SITE AND VICINITY DESCRIPTION

The proposed HBEP site is located in the city of Huntington Beach at 21730 Newland Street, just north of the intersection of the Pacific Coast Highway (Highway 1) and Newland Street, within the South Coast Air Quality Management District (SCAQMD). Huntington Beach is a seaside city in Orange County in Southern California. The project is located on the site of the existing Huntington Beach Generating Station (HBGS), an operating power plant. The HBEP site is bounded on the west by a manufactured home/recreational vehicle park, on the north by a tank farm, on the north and east by the Huntington Beach Channel and residential areas, on the southeast by the Huntington Beach Wetland Preserve/Magnolia Marsh wetlands, and to the south and southwest by the Huntington Beach State Park and the Pacific Ocean. The site is located on a gently sloping coastal plain (HBEP 2012a, section 5.9).

The HBEP is proposed as a natural gas-fired, combined-cycle, air-cooled, nominal 939-megawatt (MW) electrical generating facility. It would include two independently operating, three-on-one, combined cycle gas turbine power blocks (HBEP Block 1 and HBEP Block 2) and a shared common area. Each power block would consist of three natural gas-fired combustion turbine generators (CTGs), three supplemental duct-fired heat recovery steam generators (HRSGs), one steam turbine generator, one air-cooled condenser, and other related ancillary facilities. The turbines would use dry low NOx (oxides of nitrogen) burners and selective catalytic reduction to limit NOx emissions to 2 parts per million by volume (ppmv). Emissions of carbon monoxide (CO) would be limited to 2 ppmv and volatile organic compounds (VOCs) to 2 ppmv through the use of the best combustion practices and the use of an oxidation catalyst. The HBEP would retain the use of the two existing 275-horsepower diesel-fired emergency fire water pumps, which were installed during the existing Huntington Beach Generating Station's Units 3 and 4 retooling project in 2001. Because the existing fire pumps are already permitted by the South Coast Air Quality Management District (SCAQMD) and are considered part of the existing background conditions, they were not included in the public health analysis for HBEP (HBEP 2012a, section 2.0 and HBEP 2014d).

The proposed HBEP site is located in an industrial area in Huntington Beach (HBEP 2012a, section 5.6). According to the Application for Certification (AFC), approximately 353,173 residents live within a 6-mile radius of HBEP, and the sensitive receptors within a 6-mile radius of the project site include (HBEP 2012a, section 5.9.2):

- 275 preschool/daycare centers
- 12 nursing homes
- 81 schools
- 579 hospitals, clinics, and/or pharmacies
- 7 colleges

The nearest sensitive receptor is a daycare facility located 0.3 mile east of the project site. The nearest school is Edison High School, located approximately 0.5 mile to the northeast of the project site. The nearest resident is approximately 250 feet west-northwest of the facility along Newland Street. The nearest businesses are located along Edison Drive, just north of the project site (HBEP 2012a, section 5.9.2).

METEOROLOGY AND CLIMATE

Meteorological conditions, including wind speed, wind direction, and atmospheric stability, affect the extent to which pollutants are dispersed into the air and the direction of pollutant transport. This, in turn, affects the level of public exposure to emitted pollutants along with the associated health risks. When wind speeds are low and the atmosphere is stable, for example, dispersion is reduced, and localized exposures may be increased.

Atmospheric stability is one characteristic related to turbulence, or the ability of the atmosphere to disperse pollutants from convective air movement. Mixing heights (the height marking the region within which the air is well mixed below the height) are lower during mornings because of temperature inversions. These heights increase during warm afternoons. Staff's **AIR QUALITY** section presents a more detailed description of meteorological data for the area.

The climate of the South Coast Air Basin is mild, tempered by cool sea breezes. The area's climatic conditions are strongly influenced by its terrain and geographical location. The basin is a coastal plain with connecting broad valleys and low hills, bounded by the Pacific Ocean in the southwest quadrant with high mountains forming the remainder of the perimeter. The general region lies in the semi-permanent high pressure zone of the eastern Pacific. This usually mild climatological pattern is interrupted infrequently by periods of extremely hot weather, winter storms, or Santa Ana winds (HBEP 2012a, section 5.1.3.2).

The annual and quarterly wind rose plots (from 2008 to 2012) for the John Wayne Airport meteorological station[1] show that the prevailing winds that blow to the proposed HBEP were mostly from the southwest. Only a small percent of prevailing winds blow to the proposed HBEP were from other directions (HBEP 2014b). Please refer to the **AIR QUALITY** section for more details.

EXISTING SETTING

As previously noted, the proposed HBEP site is located within the South Coast Air Basin (SCAB) and within the South Coast Air Quality Management District (SCAQMD). By examining average toxic concentration levels from representative air monitoring sites, together with cancer risk factors specific to each carcinogenic contaminant, a lifetime cancer risk can be calculated to provide a background risk level for inhalation of ambient air. When examining such risk estimates, staff considers it important to note that the overall lifetime risk of developing cancer for the average female in the United States is about 1 in 3, or 333,333 in 1 million and about 1 in 2, or 500,000 in 1 million for the average male (ACS 2013). From 2005 to 2009, the cancer incidence rates in California are 51.05 in 1 million for males and 39.89 for females. Also, from 2005 to 2009, the cancer death rates for California are 19.49 in 1 million for males and 14.17 in 1 million for females (ACS 2013).

EXISTING PUBLIC HEALTH CONCERNS

When evaluating a new project, staff usually conducts a study and analysis of existing public health issues in the project vicinity (i.e. areas within the same county or air basin). This analysis is prepared in order to identify the current status of respiratory diseases (including asthma), cancer, and childhood mortality rates in the population located within the same county or air basin of the proposed project site. Such assessment of existing health concerns provides staff with a basis on which to evaluate the significance of any additional health impacts from the proposed HBEP and assess the need for further mitigation.

The asthma diagnosis rates in Orange County are lower than the average rates in California for both adults (age 18 and over) and children (ages 1-17). The percentage of adults diagnosed with asthma was reported as 6.0 percent in 2005-2007, compared to 7.7 percent for the general California population. Rates for children for the same 2005-2007 period were reported as 9.5 percent compared to 10.1percent for the state in general (Wolstein et al., 2010).

By examining the State Cancer Profiles presented by the National Cancer Institute, staff found that cancer death rates in Orange County have been falling between 2006 and 2010. These rates (of 15.08 per 1,000,000, combined male/female) were somewhat lower than the statewide average of 16.03 per 1,000,000 (National Cancer Institute 2013).

[1] A wind rose plot is a diagram that depicts the distribution of wind direction and speed at a location over a period of time. The applicant provided wind rose plots for the Costa Mesa meteorological station in the Appendix 5.1C of AFC. The applicant didn't update the wind rose plots after switching to use meteorological date from the John Wayne Airport. Staff generated wind rose plots using AREMOD.

There are some ambient monitoring sites for TACs in the SCAB. Air quality and health risk data in Table C-20 of California Almanac of Emissions and Air Quality – 2009 Edition (ARB 2009) are for SCAB for years 1990 - 2005. The data show a downward trend in TAC annual average concentrations, along with related cancer risks (ARB 2009).

The Multiple Air Toxics Exposure Study II and III (MATES II and III) have been conducted in the SCAB by the SCAQMD Governing Board. MATES II and III consisted of a comprehensive monitoring program, an updated emissions inventory, and a modeling effort to characterize health risks associated with human exposures to ambient concentrations of TACs in the SCAB. Both the MATES II and MATES III studies showed that mobile sources, such as cars, trucks, trains, ships, and aircraft, represent the greatest contributors to estimated health risks in Orange County. About 70 percent of all carcinogenic risk is attributed to diesel particulate matter (DPM) emissions in MATES II; while about 84 percent of all carcinogenic risk is attributed to DPM emissions in MATES III. Overall, the general trend in risk exposure has been decreasing with the estimated cancer risk from exposure to airborne toxics (HBEP 2012a, section 5.9.2). The comparison of the county-wide population-weighted risk in Table 4-5 in the final report of MATES III showed the TAC reductions that occurred in Orange County, from 833 per million to 781 per million. SCAB follows the same trend, showing that TACs reduced from 931 per million to 853 per million (MATES III 2008).

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

METHOD AND THRESHOLD FOR DETERMINING SIGNIFICANCE

This section discusses TAC emissions to which the public could be exposed during project construction/demolition and routine operation. Following the release of TACs into the air, water or soil, people would come into contact with them through inhalation, dermal contact, or ingestion, via contaminated food, water or soil.

Air pollutants for which no ambient air quality standards have been established are called non-criteria pollutants. Unlike criteria pollutants such as ozone, carbon monoxide, sulfur dioxide, or nitrogen dioxide, non-criteria pollutants have no ambient (outdoor) air quality standards that specify levels considered safe for everyone[2]. Since non-criteria pollutants do not have such standards, a health risk assessment (HRA) is used to determine if people might be exposed to those types of pollutants at unhealthy levels.

The standard approach currently used for a HRA involves four steps: 1) hazard identification, 2) exposure assessment, 3) dose-response assessment, and 4) risk characterization (OEHHA 2003). These four steps are briefly discussed below:

1. Hazard identification is conducted to determine the potential health effects that could be associated with project emissions. For air toxics sources, the main purpose is to identify whether or not a hazard exists. Once a hazard has been identified, staff evaluates the exact toxic air contaminant(s) of concern and determines whether a TAC is a potential human carcinogen or is associated with other types of adverse health effects.

[2] Carbon dioxide (CO_2) is also a non-criteria pollutant, but it is also not considered a TAC at normal concentrations and is not evaluated in this analysis.

2. An exposure assessment is conducted to estimate the extent of public exposure to project emissions, including: (1) the worst-case concentrations of project emissions in the environment using dispersion modeling; and (2) the amount of pollutants that people could be exposed to through inhalation, ingestion, and dermal contact. Therefore, this step involves emissions quantification, modeling of environmental transport and dispersion, evaluation of environmental fate, identification of exposure routes, identification of exposed populations and sensitive subpopulations, and estimation of short-term and long-term exposure levels.

3. A dose-response assessment is conducted to characterize the relationship between exposure to an agent and incidence of an adverse health effect in exposed populations. The assumptions and methodologies of dose-response assessment are different between cancer and noncancer health effects. In cancer risk assessment, the dose-response relationship is expressed in terms of a potency (or slope) factor that is used to calculate the probability of getting cancer associated with an estimated exposure. In cancer risk assessment, it is assumed that risk is directly proportional to dose. It is also assumed that there is no threshold for carcinogenesis. In non-cancer risk assessment, dose-response data developed from animal or human studies are used to develop acute and chronic non-cancer Reference Exposure Levels (RELs). The acute and chronic RELs are defined as the concentration at which no adverse non-cancer health effects are anticipated. Unlike cancer health effects, non-cancer acute and chronic health effects are generally assumed to have thresholds for adverse effects. In other words, acute or chronic injury from a TAC would not occur until exposure to the pollutant has reached or exceeded a certain concentration (i.e., threshold).

4. Risk characterization is conducted to integrate the health effects and public exposure information and to provide quantitative estimates of health risks resulting from project emissions. Staff characterizes potential health risks by comparing worst-case exposure to safe standards based on known health effects.

Staff conducts its public health analysis by evaluating the information and data provided in the AFC by the applicant. Staff also relies upon the expertise and guidelines of the California Environmental Protection Agency (Cal/EPA) Office of Environmental Health Hazard Assessment (OEHHA) in order to: identify contaminants that cause cancer or other noncancer health effects, and identify the toxicity, cancer potency factors and non-cancer RELs of these contaminants. Staff relies upon the expertise of the California Air Resources Board (ARB) and the local air districts to conduct ambient air monitoring of TACs and on the California Department of Public Health to evaluate pollutant impacts in specific communities. It is not within the purview or the expertise of the Energy Commission staff to duplicate the expertise and statutory responsibility of these agencies.

For each project, a screening-level risk assessment is initially performed using simplified assumptions that are intentionally biased toward protection of public health. That is, staff uses an analysis designed to overestimate public health impacts from exposure to project emissions. In reality, it is likely that the actual risks from the source in question would be much lower than the risks as estimated by the screening-level assessment. The risks for such screening purposes are based on examining conditions that would lead to the highest, or worst-case, risks and then using those assumptions in the assessment. Such an approach usually involves the following:

- using the highest levels of pollutants that could be emitted from the plant;
- assuming weather conditions that would lead to the maximum ambient concentration of pollutants;
- using the type of air quality computer model which predicts the greatest plausible impacts;
- calculating health risks at the location where the pollutant concentrations are estimated to be the highest;
- assuming that an individual's exposure to carcinogenic (cancer-causing) agents would occur continuously for 70 years; and
- using health-based objectives aimed to protect the most sensitive members of the population (i.e., the young, elderly, and those with respiratory illnesses).

A screening-level risk assessment would, at a minimum, include the potential health effects from inhaling hazardous substances. Some facilities would also emit certain substances (e.g. semi-volatile organic chemicals and heavy metals) that could present a health hazard from non-inhalation pathways of exposure (OEHHA 2003, Tables 5.1, 6.3, 7.1). When these multi-pathway substances are present in facility emissions, the screening-level analysis would include the following additional exposure pathways: soil ingestion, dermal exposure, consumption of locally grown plant foods, mother's milk and water ingestion[3] (OEHHA 2003, p. 5-3).

The HRA process addresses three categories of health impacts: (1) acute (short-term) health effects, (2) chronic (long-term) noncancer effects, and (3) cancer risk (also long-term).

Acute Noncancer Health Effects

Acute health effects are those that result from short-term (one-hour) exposure to relatively high concentrations of pollutants. Such effects are temporary in nature and include symptoms such as irritation of the eyes, skin, and respiratory tract.

[3] The exposure pathways of HRA for HBEP included inhalation, home grown produce, dermal absorption, soil ingestion, and mother's milk, not including water ingestion.

Chronic Noncancer Health Effects

Chronic noncancer health effects are those that result from long-term exposure to lower concentrations of pollutants. Long-term exposure has been defined as more than 12% of a lifetime, or about 8 years (OEHHA 2003, p. 6-5). Chronic noncancer health effects include diseases such as reduced lung function and heart disease.

Reference Exposure Levels (RELs)

The analysis for both acute and chronic noncancer health effects compares the maximum project contaminant levels to safe levels known as Reference Exposure Levels, or RELs. These are amounts of toxic substances to which even sensitive individuals could be exposed without suffering any adverse health effects (OEHHA 2003, p. 6-2). These exposure levels are specifically designed to protect the most sensitive individuals in the population, such as infants, the aged, and people with specific illnesses or diseases which make them more sensitive to the effects of toxic substance exposure. The RELs are based on the most sensitive adverse health effect reported in the medical and toxicological literature and include specific margins of safety. The margins of safety account for uncertainties associated with inconclusive scientific and technical information available at the time of standard setting. They are therefore meant to provide a reasonable degree of protection against hazards that research has not yet identified.

Concurrent exposure to multiple toxic substances would result in health effects that are equal to, less than, or greater than effects resulting from exposure to the individual chemicals. Only a small fraction of the thousands of potential combinations of chemicals have been tested for the health effects of combined exposures. In conformity with California Air Pollution Control Officers Association (CAPCOA) guidelines, the HRA assumes that the effects of each substance are additive for a given organ system (OEHHA 2003, pp. 1-5, 8-12). Other possible mechanisms due to multiple exposures include those cases where the actions would be synergistic or antagonistic (where the effects are greater or less than the sum, respectively). For these types of exposures, the health risk assessment could underestimate or overestimate the risks.

Cancer Risk and Estimation Process

For carcinogenic substances, the health assessment considers the risk of developing cancer and assumes that continuous exposure to the carcinogen would occur over a 70-year lifetime. The risk that is calculated is not meant to project the actual expected incidence of cancer, but rather a theoretical upper-bound estimate based on the worst-case assumptions.

Cancer Potency Factors

Cancer risk is expressed in terms of chances per million of developing cancer. It is a function of the maximum expected pollutant concentration, the probability that a particular pollutant would cause cancer (called potency factors), and the length of the exposure period. Cancer risks for individual carcinogens are added together to yield a total cancer risk for each potential source. The conservative nature of the screening assumptions used means that the actual cancer risks from project emissions would be considerably lower than estimated.

As previously noted, the screening analysis is performed to assess the worst-case risks to public health associated with the proposed project. If the screening analysis were to predict a risk below significance levels, no further analysis would be necessary and the source would be considered acceptable with regard to carcinogenic effects. If however, the risk were to be above the significance level, then further analysis using more realistic site-specific assumptions would be performed to obtain a more accurate estimate.

SIGNIFICANCE CRITERIA

Energy Commission staff assesses the maximum cancer impacts from specific carcinogenic exposures by first estimating the potential impacts on the maximally exposed individual. This is a person hypothetically exposed to project emissions at a location where the highest ambient impacts were calculated using the worst-case assumptions. Since the individual's exposure would produce the maximum impacts possible around the source, staff uses this risk estimate as a marker for acceptability of the project's carcinogenic impacts.

Acute and Chronic Noncancer Health Risks

As described earlier, non-criteria pollutants are evaluated for short-term (acute) and long-term (chronic) non-cancer health effects, and the noted cancer impacts from long-term exposures. The significance of project-related impacts is determined separately for each of the three health effects categories. Staff assesses the noncancer health effects by calculating a hazard index. A hazard index is a ratio obtained by comparing exposure from facility emissions to the safe exposure level (i.e. REL) for that pollutant. A ratio of less than 1.0 suggests that the worst-case exposure would be below the limit for safe levels and would thus be insignificant with regard to health effects. The hazard indices for all toxic substances with the same type of health effect are added together to yield a Total Hazard Index for the source. The Total Hazard Index is calculated separately for acute effects and chronic effects. A Total Hazard Index of less than 1.0 would indicate that cumulative worst-case exposures would be not lead to significant noncancer health effects. In such cases, noncancer health impacts from project emissions would be considered unlikely even for sensitive members of the population. Staff would therefore conclude that there would be no significant noncancer project-related public health impacts. This assessment approach is consistent with risk management guidelines of both California OEHHA and U.S. EPA.

Cancer Risk

Staff relies upon regulations implementing the provisions of Proposition 65, the Safe Drinking Water and Toxic Enforcement Act of 1986, (Health & Safety Code, §§25249.5 et seq.) for guidance in establishing significance levels for carcinogenic exposures. Title 22, California Code of Regulations section 12703(b) states that “the risk level which represents no significant risk shall be one which is calculated to result in one or less excess cancer cases within an exposed population of 100,000, assuming lifetime exposure.” This risk level is equivalent to a cancer risk of 10 in 1 million, which is also written as 10×10^{-6}. In other words, under state regulations, an incremental cancer risk greater than 10 in 1 million from a project should be regarded as suggesting a potentially significant carcinogenic impact on public health. The 10 in 1million risk level is also used by the Air Toxics "Hot Spots" (AB 2588) program as the public notification threshold for air toxic emissions from existing sources.

An important distinction between staff's and the Proposition 65 risk characterization approach is that the Proposition 65 significance level applies separately to each cancer-causing substance, whereas staff determines significance based on the total risk from all the cancer-causing pollutants to which the individual might be exposed in the given case. Thus, the manner in which the significance level applied by staff is more conservative (health-protective) than the manner applied by Proposition 65. The significant risk level of 10 in 1 million is also consistent with the level of significance adopted by many California air districts. In general, these air districts would not approve a project with a cancer risk estimate more than 10 in 1 million.

As noted earlier, the initial risk analysis for a project is typically performed at a screening level, which is designed to overstate actual risks, so that health protection could be ensured. Staff's analysis also addresses potential impacts on all segments of the population including the young, the elderly, and people with existing medical conditions that would render them more sensitive to the adverse effects of toxic air contaminants and any minority or low-income populations that are likely to be disproportionately affected by impacts. To accomplish this goal, staff uses the most current acceptable public health exposure levels (both acute and chronic) set to protect the public from the effects of air toxics being analyzed. When a screening analysis shows the cancer risks to be above the significance level, refined assumptions would be applied for likely a lower, more realistic risk estimate. If after refined assumptions, the project's risk is still found to exceed the significance level of 10 in 1 million, staff would require appropriate measures to reduce the risk to less than significance levels. If, after all feasible risk reduction measures have been considered and a refined analysis still identifies a cancer risk of greater than 10 in 1 million, staff would deem such a risk to be significant and would not recommend project approval.

DIRECT/INDIRECT IMPACTS AND MITIGATION

PROPOSED PROJECT'S CONSTRUCTION/DEMOLITION IMPACTS AND MITIGATION MEASURES

The construction and demolition period for HBEP would be approximately 7.5 years (HBEP 2013j). Construction of HBEP Power Blocks 1 and 2 would be coordinated with the operation and demolition of existing HBGS Units 1, 2, 3, 4, and 5. Demolition of Unit 5, fuel tanks and Unit 3 & 4 stack, scheduled to occur between the first quarter of 2015 and the second quarter of 2016, would provide the space for the construction of HBEP Block 1. Construction of Power Blocks 1 and 2 are expected to take approximately 30 and 28 months, respectively, with Block 1 construction scheduled to occur from the third quarter of 2016 through the fourth quarter of 2018, and Block 2 construction scheduled to occur from the third quarter of 2018 through the second quarter of 2020. Removal/demolition of existing HBGS Units 1 and 2 is scheduled to occur from the fourth quarter of 2020 through the third quarter of 2022. Demolition of existing HBGS Units 3 and 4 is scheduled to occur from the first quarter of 2016 through the first quarter of 2018. However, the demolition of Units 3 and 4 is not part of the HBEP project definition. Although demolition of existing HBGS Units 3 and 4 is not part of the HBEP project definition, demolition of the Units 3 and 4 stacks would occur during removal of Unit 5 and is included in applicant's analysis. Please see **Project Description – Table 1** in this FSA for the details regarding the timeline of construction/demolition activity.

The potential construction/demolition risks are normally associated with exposure to asbestos, fugitive dust, and combustion emissions (i.e. diesel exhaust).

Asbestos

The demolition of buildings containing asbestos would cause the emission of asbestos. Asbestos is a mineral fiber that occurs in rock and soil. Because of its fiber strength and heat resistance, it has been used in a variety of building construction materials for insulation and as a fire-retardant. Asbestos has been used in a wide range of manufactured goods, mostly in building materials (roofing shingles, ceiling and floor tiles, paper products, and asbestos cement products), friction products (automobile clutch, brake, and transmission parts), heat-resistant fabrics, packaging, gaskets, and coatings (US EPA 2012). Structures built before 1980 are more likely to have asbestos containing materials (ACM). Thermal system insulation (formed or spray-on) is the ACM of greatest concern for response and recovery worker exposure (OSHA).

Exposure to asbestos and asbestos containing materials (ACM) increases workers' and residences' risk of developing lung diseases, including asbestosis, lung cancer, and mesothelioma.

In Figure 2.2-2 and Figure 2.2-3 of the AFC, asbestos is listed under the removal of insulation of piping and boiler. Also, in page 4 of Appendix 5.14A (Phase I Environmental Site Assessment), Environmental Management Strategies, Inc. (EMS), it was noted that "the site buildings were constructed prior to 1980; therefore, asbestos-containing building materials and lead based paint may be present on-site." In Table 5.1-38, the applicant stated that they would comply with all requirements outlined in SCAQMD Rule 1403, which requires the notification and special handling of asbestos-containing materials during demolition activities (HEBA 2012a). The following actions were proposed by the applicant to comply with SCAQMD Rule 1403 (HEBA 2012n):

1. Prior to starting demolition activities, the applicant would conduct a facility survey to identify and quantify the presence of all friable and non-friable Class I and Class II asbestos-containing material (ACM). The survey would document the contact information and written qualifications for the person conducting the survey, survey dates, a listing of ACM, a sketch of where all samples were collected, contact information and a statement of qualifications for the laboratory conducting the ACM sample analyses, and sample test methods used with sampling protocols and laboratory methods.

2. The applicant (or its contractor) would notify the SCAQMD and California Energy Commission construction project manager (CPM) by letter of the intent to conduct demolition activities in a district-approved format no later than 10 working days prior to the start of any demolition activities. The notification would include:

   - whether it is original or revised,

- contact information for the applicant, supervising person, operator, asbestos removal contractor,
- facility address and location,
- a description of the affected parts (square feet/meters, number of floors, age, and present or prior uses) of the facility to be demolished,
- the specific location of ACM removal at the facility,
- schedule for starting and completing the demolition activity,
- a brief description of work practices and engineering controls to be employed to remove and handle ACM,
- an estimate of the amount of friable ACM and non-friable (Class I and Class II) ACM to be removed,
- name and location of the ACM waste disposal facility,
- procedures describing the identification of unexpected ACM or Class II non-friable asbestos,
- State Contractors License and Cal/OSHA Registration Numbers,
- procedures used to detect and analyze friable and non-friable asbestos, and
- certification that a trained person would supervise stripping and removal activities.

Notifications would be updated as appropriate to document if the quantity of affected asbestos changes by more than 20 percent and changes in the start and completion dates.

3. Asbestos removal would employ one or more of the following methods: High Efficiency Particulate Air (HEPA) Filtration, Glovebag or Minienclosures, Dray Removal, or an alternative approved method.

4. Collected ACM would be placed in a leak-tight container and would be handled and stored to avoid releasing ACM to the atmosphere. Storage containers would be appropriately marked with warning labels.

5. The applicant would designate an onsite representative to be present during all ACM demolition or handling procedures. The onsite representative would successfully complete the Asbestos Abatement Contractor/Supervisor course pursuant to the Asbestos Hazard Emergency Response Act and Provision of Title 40, Code of Federal Regulations, Parts 61.145 to 61.147, 61.152, and Part 763.

6. The applicant would dispose of ACM wastes at a licensed waste disposal facility and would maintain copies of the waste shipment records. ACM wastes would be hauled from the site by an appropriately licensed ACM waste transporter and the applicant would maintain copies of all manifests.

Small quantities of other hazardous wastes would also be generated during construction or demolition phases of the project. The applicant stated that “hazardous waste management plans would be in place so the potential for public exposure is minimal.”

The mitigation measures needed to reduce the impacts of asbestos, ACM and other hazardous wastes from the construction or demolition phases of the project are covered in the **WASTE MANAGEMENT** section. As for asbestos, Conditions of Certification **WASTE-2** requires that the project owner submit the SCAQMD Asbestos Notification Form to SCAQMD and the Energy Commission for review and approval prior to removal and disposal of asbestos. This program ensures there will be no release of asbestos that could impact public health and safety. Please refer to staff's **WASTE MANAGEMENT** section for detailed mitigation measures regarding the construction/demolition of asbestos and ACM, and information on the safe handling and disposal of these and all project-related wastes.

Fugitive Dust

Fugitive dust is defined as dust particles that are introduced into the air through certain activities such as soil cultivation, vehicles operating on open fields, or dirt roadways. Fugitive dust emissions during construction of the proposed project could occur from:

- dust entrained during site preparation and grading/excavation at the construction site;
- dust entrained during onsite movement of construction vehicles on unpaved surfaces;
- fugitive dust emitted from an onsite concrete batch plant; and
- wind erosion of areas disturbed during construction activities.

The effects of fugitive dust on public health are covered in the **AIR QUALITY** section, which includes staff's recommended mitigation measures, including **AQ-SC3 (Construction Fugitive Dust Control)** and **AQ-SC4 (Dust Plume Response Requirement)** to prevent fugitive dust plumes from leaving the project boundary. As long as the dust plumes are kept from leaving the project site, there will be no significant concern of fugitive dust adversely affecting public health.

Diesel Exhaust

Emissions of combustion byproducts during construction would result from:

- exhaust from diesel construction equipment used for site preparation, grading, excavation, trenching, and construction of onsite and offsite (transmission- and gas pipeline-related) structures;
- exhaust from water trucks used to control construction dust emissions;
- exhaust from portable welding machines, small generators, and compressors;
- exhaust from diesel trucks used to transport workers and deliver concrete, fuel, and construction supplies to construction areas; and
- exhaust from vehicles used by construction workers to commute to and from the project areas.

Construction Health Risk Assessment (HRA) for Diesel Exhaust

The primary air toxic pollutant of concern from construction/demolition activities is diesel particulate matter (diesel PM or DPM). Diesel exhaust is a complex mixture of thousands of gases and fine particles and contains over 40 substances listed by the U.S. Environmental Protection Agency (EPA) as hazardous air pollutants (HAPs) and by ARB as toxic air contaminants. The diesel particulate matter (DPM) is primarily composed of aggregates of spherical carbon particles coated with organic and inorganic substances. Diesel exhaust deserves particular attention mainly because of its ability to induce serious noncancer effects and its status as a likely human carcinogen.

Diesel exhaust is also characterized by ARB as "particulate matter from diesel-fueled engines." The impacts from human exposure would include both short- and long-term health effects. Short-term effects can include increased coughing, labored breathing, chest tightness, wheezing, and eye and nasal irritation. Effects from long-term exposure can include increased coughing, chronic bronchitis, reductions in lung function, and inflammation of the lung. Epidemiological studies strongly suggest a causal relationship between occupational diesel exhaust exposure and lung cancer. Diesel exhaust is listed by the EPA as "likely to be carcinogenic to humans" (U.S. EPA 2003).

Based on a number of health effects studies, the Scientific Review Panel on Toxic Air Contaminants in 1998 recommended a chronic REL for diesel exhaust particulate matter of 5 micrograms per cubic meter of air ($\mu g/m^3$) and a cancer unit risk factor of $3x10^{-4}$ $(\mu g/m^3)^{-1}$. The Scientific Review Panel did not recommend a specific value for an acute REL since available data in support of a value was deemed insufficient. Therefore, there is no acute relative exposure level (REL) for diesel particulate matter. In 1998, ARB listed particulate emissions from diesel-fueled engines as a toxic air contaminant and approved the panel's recommendations regarding health effects (OEHHA 2009, Appendix A). In 2000, ARB developed a "Risk Reduction Plan to Reduce Particulate Matter Emissions From Diesel-Fueled Engines and Vehicles" and has been developing regulations to reduce diesel particulate matter emissions since that time.

In Applicant's Response to Data Requests 74-77 and 107-109, a screening construction HRA for diesel particulate matter was conducted to assess the potential impacts associated with diesel emissions during the construction and demolition activities at HBEP. The results of the analysis are contained in **Public Health Table 2** (HBEP 2013j, HBEP 2013k, HBEP 2013aa, HBEP 2013ll).

The construction HRA was performed for a shorter exposure duration and different receptor locations. The total DPM exhaust emissions from construction/demolition activities were averaged over the 7.5-year construction period and spatially distributed in the area associated with the demolition of the Unit 5 peaker, Units 3 and 4 stack, and construction of Block 1; the area associated with the construction of Block 2; and the area associated with the demolition of Units 1 and 2 and the construction of buildings 33 and 34 (HBEP 2012c and HBEP 2013j).

This HRA was based on the annual average emissions of diesel particulate matter (DPM), assumed to occur each year for 9 years of continuous exposure[4]. This is because the HARP model limits short-term, continuous residential exposure to 9 years. OEHHA Derived Methodology was used to determine the residential and sensitive receptor exposure cancer risk. An adjusted 9-year, 5-days-per-week, 10 hours-per-day, exposure duration was used for commercial/industrial receptors[5]. Staff only evaluates the health impact of off-site workers because on-site workers are protected by Cal OSHA and are not required to be evaluated under the Hot Spots Program, unless the worker also lives on the facility site or property (OEHHA 2003, Chapter 8, pp. 8-5 and 8-6).

Based on the applicant's analysis, the predicted incremental increases in cancer risk at the Point of Maximum Impact (PMI), Maximally Exposed Individual Resident (MEIR) and Maximally Exposed Individual Worker (MEIW) associated with construction/demolition activities are 12.3 in one million, 3.5 in one million and 11 in one million, respectively. The PMI for children is 18.2 per million. The predicted chronic health index at the PMI, MEIR and MEIW are 0.0461, 0.0131, and 0.115, respectively (HBEP 2013j, HBEP 2013k, HBEP 2013aa, HBEP 2013ll).

Public Health Table 2
Construction Hazard/Risk from DPMs calculated by the Applicant

				Significance Level	Significant?
Derived Cancer Risk (per million)	PMI	Adults	**12.3**	10	**Yes**
		Children	**18.2**	10	**Yes**
	MEIR	Adults	3.5	10	No
		Children	5.18	10	No
	at a Sensitive Receptor (Daycare)		1.86	10	No
	MEIW		**11**	10	**Yes**
Chronic HI (dimensionless)	PMI		0.0461	1	No
	MEIR		0.0131	1	No
	MEIW		0.115	1	No

Sources: HBEP 2013j, HBEP 2013k, HBEP 2013aa, and HBEP 2013ll.

The excess cancer risks at the PMI for both adults and children are higher than the California Environmental Quality Act (CEQA) significance threshold of 10 in one million, a level that does not necessary mean that adverse impacts are expected, but rather that further analysis and refinement of the exposure assessment is warranted. The applicant stated in Resubmission of Data Responses, Set 1B, 4, and 5 "*although the PMI and MEIW excess cancer risk is greater than 10 in one million, the elevated risk only occurs in areas where public access is controlled (i.e., within the AES-controlled fence line) or in areas that are not considered residential, commercial, or habitable, as presented in Figure DR109-1R. Additionally, any potential exposure would be sporadic and limited in length. Further, the predicted incremental increase in cancer risk at the MEIR and MEIW*

[4] According to OEHHA's guideline, health risk assessment was conducted for different durations of exposure based on how long people live at a single location (9 years for the average, 30 years for a high end estimates, and 70 years for a lifetime) (OEHHA 2012, page 1-6). The scenario of 9-year exposure is consistent with construction activities because HARP cannot be used for shorter periods of time.

[5] Since the annual average determined by air modeling program is 24 hours per day, 7 days per week , 365 days per year regardless of the actual operating schedule of the facility, the adjustment factor = (7/5)×(24/10) = 3.36 (OEHHA 2003, Chapter 8, pp.8-6).

and chronic health index at the PMI, MEIR, and MEIW are less than the California Environmental Quality Act (CEQA) significance thresholds of 10 in one million and 1.0, respectively. Therefore, impacts associated with the finite construction activities are less than significant" (HBEP 2013ll, page 27).

Figure DR109-1R: HBEP Construction Excess Cancer Risk Assessment Isopleths 10 in One Million provided by the applicant, shows that the construction cancer risk exceeds the threshold of 10 in one million on the eastern fence line, in the adjacent open space area and a fuel oil tank farm - neither of which includes residential or commercial/industrial buildings (HBEP 2013ll). Staff agrees with the applicant and regards the related conditions of certification of **AQ-SC5** (Diesel-Fueled Engine Control) in the **AIR QUALITY** section as adequate to ensure that cancer-related impacts of diesel exhaust emissions for the public and off-site workers are mitigated during construction/demolition to a point where they are not considered significant. Also, since the adjacent wetland and Tank Farm are already fenced by their property owners, there would not be any public access to this area during construction/demolition period. However, since the risk value is higher than the public notification levels of SCAQMD (i.e. ≥ 10 in one million), staff recommends the applicant be required to follow SCAQMD's notification procedures (SCAQMD 2011 and HBEP 2014d).

The chronic hazard indices for diesel exhaust during construction/demolition activities are lower than the significance level of 1.0. This means that there would be no chronic non-cancer impacts from construction/demolition activities.

The potential levels of criteria pollutants from operation of construction-related equipment are discussed in staff's **AIR QUALITY** section along with mitigation measures and related conditions of certification. The pollutants of most concern in this regard are particulate matter (PM), carbon monoxide (CO), sulfur dioxide (SO_2), and nitrogen dioxide (NO_2).

PROPOSED PROJECT'S OPERATIONAL IMPACTS AND MITIGATION MEASURES

Emission Sources

As previously noted, the proposed HBEP would be a natural gas-fired, combined-cycle, air-cooled, nominal 939-megawatt (MW) electrical generating facility. Pollutants that could potentially be emitted are listed in **Public Health Table 3,** including both criteria and non-criteria pollutants. These pollutants include certain volatile organic compounds (VOCs) and polycyclic aromatic hydrocarbons (PAHs). Criteria pollutant emissions and impacts are examined in staff's **AIR QUALITY** analysis. Since the facility would use dry cooling, there would be no emissions of toxic metals or VOCs from cooling tower mist or drift and no health risk from the potential presence of the Legionella bacterium responsible for Legionnaires' disease.

Tables 5.9-1, Table 5.9-2 and Table 5.1B.5 of the AFC (HBEP 2012a) list the specific non-criteria pollutants that would be emitted as combustion byproducts from the HBEP natural-gas-fired turbines. The emission factors for these pollutants were obtained from the ARB California Air Toxics Emission Factors (CATEF) emission database (ARB 2012) and the AP-42 emission factors (HBEP 2013ll), with the exception of polyaromatic hydrocarbons (PAH) and formaldehyde. The PAH emission factor was based on two separate source tests (2002 and 2004) at the Delta Energy Center in Pittsburg, California (Avogadro Group 2002 and 2004). The formaldehyde emission factor was 3.6 x 10^{-4} lbs/MMBtu, which was recommended by the SCAQMD (HBEP 2013ll).

The health risk from exposure to each project-related pollutant is assessed using the "worst case" emission rates and impacts. Maximum hourly emissions are used to calculate acute (one-hour) noncancer health effects, while estimates of maximum emissions on an annual basis are used to calculate cancer and chronic (long-term) noncancer health effects.

Public Health Table 3
The Main Pollutants Emitted from the Proposed Project

Criteria Pollutants	Non-criteria Pollutants
Carbon monoxide (CO)	Acetaldehyde
Oxides of nitrogen (NO_x)	Acrolein
Particulate matter (PM10 and PM2.5)	Ammonia
Oxides of sulfur (SO_2)	Benzene
Volatile Organic Compounds (VOCs)	1,3-Butadiene
	Ethylbenzene
	Formaldehyde
	Hexane
	Naphthalene
	Polycyclic Aromatic Hydrocarbons (PAHs, as BaP[a])
	Propylene
	Propylene oxide
	Toluene
	Xylene

Source: HBEP 2012a, Table 5.1-12, Table 5.9-1 and Table 5.9-2
[a] Benzo[a]pyrene

Hazard Identification

Numerous health effects have been linked to exposure to TACs, including development of asthma, heart disease, Sudden Infant Death Syndrome (SIDS), respiratory infections in children, lung cancer and breast cancer (OEHHA 2003). According to the HBEP AFC, the toxic air contaminants emitted from the natural gas-fired CTGs/HRSGs include acetaldehyde, acrolein, ammonia, benzene, 1,3-buadine, ethylbenzene, formaldehyde, napthalene, polycyclic aromatics, propylene oxide, toluene and xylene. **Public Health Table 3** and **Public Health Table 4** list each such pollutant.

Public Health Table 4
Types of Health Impacts and Exposure Routes Attributed to Toxic Emissions

Substance	Oral Cancer	Oral Noncancer	Inhalation Cancer	Noncancer (Chronic)	Noncancer (Acute)
Acetaldehyde			✔	✔	✔
Acrolein				✔	✔
Ammonia				✔	✔
Benzene			✔	✔	✔
1,3-Butadiene			✔	✔	
Ethyl Benzene			✔	✔	
Formaldehyde			✔	✔	✔
Napthalene		✔	✔	✔	
Polycyclic Aromatic Hydrocarbons (PAHs, as BaP)	✔		✔		
Propylene Oxide			✔	✔	✔
Toluene				✔	✔
Xylene				✔	✔

Source: OEHHA / ARB 2011 and HBEP 2012a, Table 5.9-1

Exposure Assessment

Public Health Table 4 shows the exposure routes of TACs and how they would contribute to the total risk obtained from the risk analysis. The applicable exposure pathways for the toxic emissions include inhalation, home grown produce, dermal (through the skin) absorption, soil ingestion, and mother's milk. This method of assessing health effects is consistent with OEHHA's Air Toxics Hot Spots Program Risk Assessment Guidelines (OEHHA 2003) referred to earlier.

The next step in the assessment process is to estimate ambient concentrations using a screening air dispersion model and assuming conditions that would result in maximum impacts. The applicant used the EPA-recommended air dispersion model, AERMOD, along with 5 years (2008–2012) of compatible meteorological data from the John Wayne Airport meteorological station (HBEP 2014b).

Dose-Response Assessment

Public Health Table 5 (modified from Table 5.9-2 of the AFC, including neither oral cancer potency factor nor chronic oral REL) lists the toxicity values used to quantify the cancer and noncancer health risks from the project's combustion-related pollutants. The listed toxicity values include RELs and the cancer potency factors are published in the OEHHA's Guidelines (OEHHA 2003) and OEHHA/ARB Consolidation Table of OEHHA/ARB Approved Risk Assessment Health Values (ARB 2011). RELs are used to calculate short-term and long-term noncancer health effects; while the cancer potency factors are used to calculate the lifetime risk of developing cancer.

Public Health Table 5
Toxicity Values Used to Characterize Health Risks

Toxic Air Contaminant	Inhalation Cancer Potency Factor $(mg/kg\text{-}d)^{-1}$	Chronic Inhalation REL ($\mu g/m^3$)	Acute Inhalation REL ($\mu g/m^3$)
Acetaldehyde	0.010	140	470 (1-hr) 300 (8-hr)
Acrolein	—	0.35	2.5 (1-hr) 0.7 (8-hr)
Ammonia	—	200	3,200
Benzene	0.10	60	1,300
1,3-Butadiene	0.60	20	—
Ethylbenzene	0.0087	2,000	—
Formaldehyde	0.021	9	55 (1-hr) 9 (8-hr)
Napthalene	0.12	9.0	—
Polycyclic Aromatic Hydrocarbons (PAHs, as BaP)	3.9	—	—
Propylene Oxide	0.013	3	3100
Toluene	—	300	37,000
Xylene	—	700	22,000

Sources: ARB 2011 and HBEP 2012a, Table 5.9-2

Characterization of Risks from TACs

As described above, the last step in HRA is to integrate the health effects and public exposure information, provide quantitative estimates of health risks resulting from project emissions, and then characterize potential health risks by comparing worst-case exposure to safe standards based on known health effects.

The applicant's HRA was prepared using the ARB's HARP model, version 1.4f (ARB 2012) and HARP On-ramp program (version 1.0). The HARP On-ramp tool was used to import the American Meteorological Society/EPA Regulatory Model (AERMOD) air dispersion modeling results into the HARP Risk Module. Emissions of non-criteria pollutants from the project were analyzed using emission factors, as noted previously, obtained mainly from the ARB California Air Toxics Emission Factors (CATEF) emission database (ARB 2012). Air dispersion modeling combined the emissions with site-specific terrain and meteorological conditions to analyze the mean short-term and long-term concentrations in air for use in the HRA. Ambient concentrations were used in conjunction with RELs and cancer unit risk factors to estimate the cancer and noncancer risks from operations. In the following sub-sections, staff reviews and summarizes the work of applicant, and evaluated the adequacy of applicant's analysis by conducting an independent HRA.

To evaluate the applicant's analysis, staff conducted another analysis of cancer risks and acute and chronic hazards due to combustion-related emissions from the proposed HBEP. The analysis was conducted for the general population, sensitive receptors, nearby residences and the project's work force. The sensitive receptors, as previously noted, are subgroups that would be at greater risk from exposure to emitted pollutants, and include the very young, the elderly, and those with existing illnesses.

Effective August 2012, all air toxics HRAs should use the new OEHHA's Air Toxics Hot Spots Program Risk Assessment Guideline (OEHHA 2012) which recommends breaking down exposure/risk by age group using age-dependent adjustment factors (i.e. Age Sensitivity Factors) to calculate the cancer risk. This new methodology is used to reflect the fact that exposure varies among different age groups and exposure occurring in early life has a higher weighting factor. Since HARP has not updated this new guideline, staff hand calculated the cancer risk at the Point of Maximum Impact (PMI) to check if cancer risks at this point exceed the threshold[6]. Human health risks associated with emissions from the proposed and similar projects are unlikely to be higher at any location other than the PMI. Therefore, if there is no significant impact associated with concentrations at the PMI, it can be reasonably assumed there would not be significant impacts in any other location in the project area.

Health risks potentially associated with ambient concentrations of carcinogenic pollutants were calculated in terms of excess lifetime cancer risks. The total cancer risk at any specific location is found by summing the contributions from the individual carcinogens. Health risks from non-cancer health effects were calculated in terms of hazard index as a ratio of ambient concentration of TACs to RELs for that pollutant.

The following is a summary of the most important elements of staff's heath risk assessment for the HBEP:

- the analysis was conducted using the latest version (1.4f) of ARB/OEHHA Hotspots Analysis and Reporting Program (HARP);
- emissions are based upon concurrent operation of all six natural-gas-fired turbines. The existing fire pumps are already permitted by the SCAQMD and are considered part of the existing background conditions, so they were not included in the public health analysis for HBEP;
- exposure pathways included inhalation, home grown produce, dermal absorption, soil ingestion, and mother's milk;
- the local meteorological data, local topography, grid, residence and sensitive receptors, source elevations and site-specific and building-specific input parameters used in the HARP model were obtained from the AFC, Applicant's Responses to Data Requests (Public Health #74-77), Applicant's Responses to Data Requests (Public Health #107-109), and modeling files provided by the applicant;

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[6] Staff used the simplified formula modified from the one from OEHHA by assuming that the Average Daily Doses (ADD) are all the same at different time periods. The formula for Lifetime (70 year) exposure duration - Calculation of Cancer Risk from Third Trimester to Age 70 (OEHHA 2012, page 1-7) is:
Cancer Risk = $[(ADD_{\text{third trimester}} \text{ X CPF X } 10) \text{ X } 0.3 \text{ yrs}/70 \text{ yrs}] + [(ADD_{0 \text{ to } <2\text{yrs}} \text{ X CPF X } 10) \text{ X } 2 \text{ yrs}/70 \text{ yrs}] + [(ADD_{2 < 16\text{yrs}} \text{ X CPF X } 3) \text{ X } 14 \text{ yrs}/70 \text{ yrs}] + [(ADD_{16 < 70\text{yrs}} \text{ X CPF X } 1) \text{ X } 54 \text{ yrs}/70 \text{ yrs}]$
where:

ADD = Average Daily Dose, mg/kg-d, for the specified time period
CPF = Cancer Potency Factor $(mg/kg\text{-}d)^{-1}$
Age Sensitivity Factor third trimester to less than 2 years = 10
Age Sensitivity Factor age 2 to less than 16 years = 3
Age Sensitivity Factor age 16 to less than 70 years = 1

- the emission factors and toxicity values used in staff's analysis of cancer risk and hazard were obtained from the AFC and Applicant's Responses to Data Requests (Public Health #74-77), Applicant's Responses to Data Requests (Public Health #107-109) .The toxicity values are listed in **Public Health Table 5**; and,
- cancer risk was determined using the derived (OEHHA) risk assessment method. Staff applied the Age Sensitivity Factors recommended on OEHHA 2012 Guideline on the calculation of the cancer risk at the Point of Maximum Impact (PMI).

Cancer Risk at the Point of Maximum Impact (PMI)

The most significant result of HRA is the numerical cancer risk for the maximally exposed individual (MEI) which is the individual located at the point of maximum impact (PMI) and risks to the MEI at a residence (MEIR). As previously noted, human health risks associated with emissions from the proposed project are unlikely to be higher at any other location than at the PMI. Therefore, if there is no significant impact associated with concentrations at the PMI location, it can be reasonably assumed that there would not be significant impacts in any other location in the project area. The cancer risk to the MEI at the PMI is referred to as the Maximum Incremental Cancer Risk (MICR). However, the PMI (and thus the MICR) is not necessarily associated with actual exposure because in many cases, the PMI is in an uninhabited area. Therefore, the MICR is generally higher than the maximum residential cancer risk. MICR is based on 24 hours per day, 365 days per year, 70 year lifetime exposure. As shown in **Public Health Table 6**, total worst-case individual cancer risk was calculated by staff to be 4.32 in one million (the applicant calculated 2.54 in one million [HBEP 2013ll, Table DR107-1R] without applying the Age Sensitivity Factors) at the PMI. The PMI is approximately 0.27 miles northeast of the HBEP facility boundary. As **Public Health Table 6** shows, the cancer risk value at PMI is below the significance level, 10 in one million, whether the applicant's or staff's cancer risk is used, indicating that no significant adverse cancer risk is expected.

Chronic and Acute Hazard Index (HI)

The screening HRA for the project included emissions from all sources and resulted in a maximum chronic Hazard Index (HI) of 0.00778 and a maximum acute HI of 0.0781 (HBEP 2013ll, Table DR107-1R). As **Public Health Table 6** shows, both acute and chronic hazard indices are less than 1.0, indicating that no short- or long-term adverse health effects are expected.

Project-Related Impacts at Area Residences

Staff's specific interest in the risk to the maximally exposed individual in a residential setting (MEIR is because this risk most closely represents the maximum project-related lifetime cancer risk. Residential risk is presently assumed by the regulatory agencies to result from exposure lasting 24 hours per day, 365 days per year, over a 70- year lifetime. Residential risks were presented in terms of MEIR and health hazard index (HHI) at residential receptors in **Public Health Table 6**. The cancer risk for the MEIR[7] is 2.2, which is below the significance level. The maximum resident chronic HI and acute

[7] The AFC states the nearest resident is approximately 250 feet west-northwest of the facility along Newland Street (HBEP 2012a, Section 5.9.1.1); however, MEIR is not located at this position, but is located approximately 0.42 mile northeast of the HBEP fenceline.

HI[8] are 0.00691 and 0.0502, respectively (HBEP 2013ll, Table DR107-1R). They are both less than 1.0, indicating that no short- or long-term adverse health effects are expected at these residents.

Risk to Workers

The cancer risk to potentially exposed workers was presented by the applicant in terms of risk to the maximally exposed individual worker or MEIW at PMI and is summarized in **Public Health Table 6**. The applicant's assessment is for potential workplace risks uses a shorter duration exposure rather than the 70-year exposure used residential risks. Workplace risk is presently calculated by regulatory agencies using exposures of 8 hours per day, 245 days per year, over a 40- year period. As shown in **Public Health Table 6**, the cancer risk for workers at MEIW (i.e. 0.446 in 1 million) is below the significance level (HBEP 2013ll, Table DR107-1R). All risks are below the significance level.

Risk to Sensitive Receptors

As previously noted, the nearest sensitive receptor is a daycare facility located 0.3 mile east of the project site. The cancer risk at this daycare is 0.458 in one million, the chronic HI is 0.00144 and the acute HI is 0.018. The nearest school is the Edison High School, located approximately 0.5 mile to the northeast of the project site. The cancer risk at this school is 1.65 in one million, the chronic HI is 0.00519 and the acute HI is 0.0129 (HBEP 2013ll, Table DR107-1R). All risks are below the significance level.

In **Public Health Table 6**, it is notable that the cancer and noncancerous risks from HBEP operation would be below their respective significance levels. This means that no health impacts would occur within all segments of the surrounding population. Therefore, staff concludes there is no need for conditions of certification to protect public health.

The regulation applied to gas turbines located at major sources of HAP emissions is 40CFR Part 63 Subpart YYYY. A major source is defined as a facility with emissions of 10 tons per year (tpy) or more of a single HAP or 25 tpy or more of a combination of HAPs based on the potential to emit. Although the total combined potential HAP emissions from all 6 turbines at the site are approximately 21 tpy, formaldehyde emissions from the turbines exceed 10 tpy. Therefore, HBEP is classified as a major source of HAPs, subject to this subpart (SCAQMD 2014a and SCAQMD 2014b). Subpart YYYY sets emissions limits and requires notifications, source testing, monitoring, and recordkeeping for gas turbines. However, EPA proposed to delist natural gas fired turbines from the NESHAP's on August 14, 2004. Therefore, in accordance §63.6095(d) of this subpart, natural gas fired turbines are exempt from all requirements other than the initial notification to the Administrator (SCAQMD 2014a and SCAQMD 2014c).

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8 Resident chronic HI and resident acute HI are also located at different positions from the one specified in AFC.

Public Health Table 6
Cancer Risk and Chronic Hazard from HBEP Operations

Receptor Location	Cancer Risk (per million)	Chronic HI[e]	Acute HI[e]
PMI[a]	2.54 **4.32**[d]	0.00778	0.0781
Residence MEIR[b]	2.2	0.00691	0.0502
Worker MEIW[c]	0.446	0.00778	0.0781
Highest Cancer Risk at a Sensitive Receptor (Daycare)	0.458	0.00144	0.0183
Highest Cancer Risk at a Sensitive Receptor (Edison High School)	1.65	0.00519	0.0129
Significance level	10	1	1

[a] PMI = Point of Maximum Impact
[b] MEIR = MEI of residential receptors. Location of the residence of the highest risk with a 70-year residential scenario.
[c] MEIW = MEI for offsite workers. Occupational exposure patterns assuming standard work schedule, i.e. exposure of 8 hours/day, 5 days/week, 49 weeks/year for 40 years (OEHHA 2003, Chapter 8, pp.8-5).
[d] Cancer risk calculated by using the Age Sensitivity Factors recommended by OEHHA (OEHHA 2012). The cancer risk of PMI= ADD X CPF X [(10 X 0.3 yrs/70 yrs) + (10 X 2 yrs/70 yrs) + (3 X 14 yrs/70 yrs)+ (1 X 54 yrs/70 yrs)] = (2.54 x10^{-6}) x (10 x0.3/70+10 x2/70+3 x14/70+1 x54/70) =4.32 x10^{-6}
[e] HI = Hazard Index

CUMULATIVE IMPACTS AND MITIGATION

A project would result in a significant adverse cumulative impact if 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 (California Code Regulation, Title 14, section 15130). As for cumulative impacts for cumulative hazards and health risks, if the implementation of the proposed project, as well as the past, present, and probable future projects, would not cumulatively contribute to regional hazards, then it could be considered a less than cumulatively considerable impact.

The geographic scope of analysis for cumulative effects to public health is a six-mile buffer zone around the project site. This is the same six-mile buffer zone for localized significant cumulative air quality impacts described and evaluated in the **AIR QUALITY** section. While MATES II and MATES III studies were discussed, cumulative impacts of the proposed project along with other projects within a 6-mile radius were not quantitatively evaluated in the AFC (HBEP 2012a, section 5.9.4).

The SCAQMD identified three facilities within 6 miles (~10 km) of HBEP for inclusion in the cumulative impact assessment of 1-hour NO_2 (HBEP 2013ee):

- Orange County Sanitation District (Facility ID 29110): located in Huntington Beach, California with seven emission sources

- Orange County Sanitation District (Facility ID 17301): located in Fountain Valley, California with five emission sources
- Beta Offshore (Facility ID 166903): located in Huntington Beach, California with 21 emission sources.

In addition to the above facilities, the SCAQMD also requested that emissions from shipping lane activity off the California coast be included in the cumulative impact assessment. The emissions from shipping lane activity off the California coast are not analyzed in the cumulative impact assessment due to different temporal and spatial factors.

Orange County Sanitation District's Huntington Beach facility is located approximately 1 mile southeast of the proposed HBEP site, Orange County Sanitation District's Fountain Valley facility is located approximately 3 miles northeast of the proposed HBEP site, while Beta Offshore is located approximately 3 miles northwest of the proposed HBEP site. The maximum cancer risk and non-cancer hazard index (both acute and chronic) for operations emissions from the HBEP estimated independently by the applicant, staff, and the SCAQMD are all below the level of significance. While air quality cumulative impacts could occur with sources within a 6-mile radius, cumulative public health impacts are usually not significant unless the emitting sources are extremely close to each other, within a few blocks, not miles. Staff, therefore, concludes that the proposed HBEP project, even when combined with these projects, would not contribute to cumulative impacts in the area of public health.

Moreover, as previously noted, the maximum impact location would be the spot where pollutant concentrations for the proposed project would theoretically be highest. Even at this hypothetical location, staff does not expect any significant change in lifetime risk to any person, given the calculated incremental cancer risk of 4.32 in one million, which staff regards as not contributing significantly to the previously noted county-wide population-weighted risks of MATES III, 781 per million for Orange County and 853 per million for SCAB. Modeled facility-related risks are much lower for more distant locations. Given the previously noted conservatism in the calculation method used, the actual risks would likely be much smaller. Therefore, staff does not consider the incremental risk estimate from HBEP's operation as suggesting a potentially significant contribution to the area's overall or cumulative cancer risk that includes the respective risks from the background pollutants from all existing area sources.

COMPLIANCE WITH LORS

Staff has conducted a HRA for the proposed HBEP and found no potentially significant adverse impacts for any receptors, including sensitive receptors. In arriving at this conclusion, staff notes that its analysis complies with all directives and guidelines from the Cal/EPA Office of Environmental Health Hazard Assessment and the California Air Resources Board. Staff's assessment is biased towards protection of public health and takes into account the most sensitive individuals in the population. Using extremely conservative (health-protective) exposure and toxicity assumptions, staff's analysis demonstrates that members of the public potentially exposed to toxic air contaminant emissions of this project, including sensitive receptors such as the elderly, infants, and people with pre-existing medical conditions would not experience any acute or chronic significant health risk or any significant cancer risk as a result of that exposure.

Staff incorporated every conservative assumption called for by state and federal agencies responsible for establishing methods for analyzing public health impacts. The results of that analysis indicate that there would be no direct or cumulative significant public health impact on any population in the area. Therefore staff concludes that construction and operation of the HBEP would comply with all applicable LORS regarding long-term and short-term project impacts in the area of public health.

Additionally, staff reviewed the **Socioeconomics Figure 1**, which shows the environmental justice population (see the **SOCIOECONOMICS** and **EXECUTIVE SUMMARY** sections of this FSA for further discussion of environmental justice) is not greater than fifty percent within a six-mile buffer of the proposed HBEP site. Because no members of the public potentially exposed to toxic air contaminant emissions of this project would experience acute or chronic significant health risk or cancer risk as a result, there would not be a disproportionate **Public Health** impact resulting from construction and operation of the proposed project to an environmental justice population.

PUBLIC AND AGENCY COMMENTS

Comment #1: John F. Scott submitted comments to the Energy Commission, dated October 23, 2012. Scott raised concerns regarding the health risk.

Comment #2: Morinka Horack submitted comments to the Energy Commission, dated November 14, 2012. Horack raised concerns that the residents have suffered greater health risks than they should.

Response: Staff has researched these issues and our report can be found above in the “Existing Public Health Concerns” and “Direct/Indirect Impacts and Mitigation” sections of this FSA. According to staff’s analysis, staff does not expect any significant adverse cancer, short-term, or long-term health effects to any members of the public, including low income and minority populations, from project toxic emissions.

CONCLUSIONS

Staff has analyzed the potential public health risks associated with construction and operation of the HBEP using a highly conservative methodology that accounts for impacts to the most sensitive individuals in a given population. Staff concludes that there would be no significant health impacts from the project’s air emissions. According to the results of staff’s HRA, both construction and operating emissions from the HBEP would not contribute significantly or cumulatively to morbidity or mortality in any age or ethnic group residing in the project area.

PROPOSED CONDITIONS OF CERTIFICATION

No public health conditions of certification are proposed.

ACRONYMS

AFC	Application for Certification
ARB	California Air Resources Board
ATC	Authority to Construct
Btu	British thermal unit
CAA	Clean Air Act (Federal)
CAL/EPA	California Environmental Protection Agency
CAPCOA	California Air Pollution Control Officers Association
CEC	California Energy Commission (or Energy Commission)
CEQA	California Environmental Quality Act
CTGs	Combustion Turbine Generators
CO	Carbon Monoxide
CO_2	Carbon Dioxide
DPMs	Diesel Particulate Matter
FSA	Final Staff Assessment
HAPs	Hazardous Air Pollutants
HARP	Hot Spots Reporting Program
HRA	Health Risk Assessment
HBEP	Huntington Beach Energy Project (proposed project)
HI	Hazard Index
HRSGs	Heat Recovery Steam Generators
lbs	Pounds
LORS	Laws, Ordinances, Regulations and Standards
MACT	Maximum Achievable Control Technology
MICR	Maximum Individual Cancer Risk
mg/m^3	Milligrams per Cubic Meter
MMBtu	Million British thermal units
MW	Megawatts (1,000,000 Watts)
NO	Nitric Oxide
NO_2	Nitrogen Dioxide
NO_3	Nitrates
NOx	Oxides of Nitrogen *or* Nitrogen Oxides
O_2	Oxygen
O_3	Ozone
OEHHA	Office of Environmental Health Hazard Assessment
PAHs (as BaP)	Polycyclic Aromatic Hydrocarbons (as Benzo[a]pyrene)

PM	Particulate Matter
PM10	Particulate Matter less than 10 microns in diameter
PM2.5	Particulate Matter less than 2.5 microns in diameter
ppm	Parts Per Million
ppmv	Parts Per Million by Volume
ppmvd	Parts Per Million by Volume, Dry
FSA	Final Staff Assessment (this document)
RELs	Reference Exposure Levels
SCAB	South Coast Air Basin
SCAQMD	South Coast Air Quality Management District
SO_2	Sulfur Dioxide
SO_3	Sulfate
SOx	Oxides of Sulfur
SRP	Scientific Review Panel
TACs	Toxic Air Contaminants
T-BACT	Best Available Control Technology for Toxics
TDS	Total Dissolved Solids
tpy	Tons per Year
VOCs	Volatile Organic Compounds

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SOCIOECONOMICS

Testimony of Lisa Worrall

SUMMARY OF CONCLUSIONS

Energy Commission staff concludes that construction and operation of the Huntington Beach Energy Project (HBEP) would not cause significant direct, indirect, or cumulative adverse socioeconomic impacts on the project area's housing, schools, law enforcement services, and parks. 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-proposed Conditions of Certification **SOCIO-1** and **SOCIO-2** would ensure project compliance with state and local laws, ordinances, regulations, and standards (LORS).

Staff concludes the population in the six-mile project buffer does not constitute an environmental justice population as defined by *Environmental Justice: Guidance Under the National Environmental Policy Act*, and would not trigger further scrutiny for purposes of an environmental justice analysis.

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 HBEP 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

Socioeconomics Table 1 contains socioeconomics laws, ordinances, regulations, and standards (LORS) applicable 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	
Huntington Beach Municipal Code	
Chapter 17.67	Library development impact fees
Chapter 17.75	Police facilities development impact fees
Chapter 17.76	Parkland acquisition and park facilities development impact fees

SETTING

The proposed HBEP is located in the city of Huntington Beach, Orange County, on the existing AES Huntington Generating Station property. The existing power plant is in an industrial area of Huntington Beach on Newland Street, north of the intersection with Pacific Coast Highway. The existing power plant has four operating steam generating units (units 1, 2, 3, and 4) and unit 5, a retired 133-megawatt (MW) peaking unit. A total of 22 acres of construction laydown would be required for the HBEP; 6 acres on the existing AES Huntington Generation Station property for construction staging and parking (approximately 1.5 acres) and 16 acres at the AES Alamitos Generating Station, for construction staging only. Additional demolition and construction worker parking is proposed at four locations: 3 acres of existing paved parking adjacent to HBEP, across Newland Street, 2.5 acres of existing paved parking at the corner of Pacific Coast Highway and Beach Boulevard, 225 stalls at the city of Huntington Beach shore parking west of the HBEP site, and 1.9 acres at the Plains All American Tank Farm on Magnolia Street. Shuttle service would be provided between the parking areas and the HBEP site:

For the purposes of assessing project impacts, staff defines the “local workforce” during project construction as residing within a two-hour commute of the project. This includes Santa Ana-Anaheim-Irvine Metropolitan Statistical Area (MSA) (Orange County), Los Angeles-Long Beach-Glendale Metropolitan Division (Los Angeles County), and Riverside-San Bernardino-Ontario MSA (Riverside and San Bernardino counties).The “local workforce” during project operation is defined as 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 Huntington Beach and nearby cities of Costa Mesa, Fountain Valley, and Newport Beach. The city of Huntington Beach is the study area for impacts to police services and parks. The Huntington Beach Elementary City School District and Huntington Beach Union High School District are the study areas for impacts to education. The study area for indirect and induced economic impacts is defined as Orange County. The study area for environmental justice impacts is within a six-mile buffer of the project site.

USING THE 2010 US CENSUS AND US CENSUS BUREAU’S AMERICAN COMMUNITY SURVEY IN STAFF ASSESSMENTS

The detailed social, economic, and housing information previously collected only in the decennial census was not collected for the 2010 Census (US Census 2011). This information is now collected through the U.S. Census Bureau’s American Community Survey (ACS). 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)).[1] Census Bureau staff recommends the use of data no smaller than the Census tract level.[2,3] Data from the five-year estimates is 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 of 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 by aggregating estimates of adjacent geographic areas, such as cities.

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 (CEQ 1997) and *Final Guidance for Incorporating Environmental Justice Concerns in EPA's Compliance Analyses* (US 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.

[1] 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. http://www.census.gov/dmd/www/glossary.html.

[2] 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 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. http://www.census.gov/dmd/www/glossary.html.

[3] Census Workshop: Using the American Community Survey (ACS) and The New American Factfinder (AFF) hosted by Sacramento Area Council of Governments on May 11 & 12, 2011. Workshop presented by Barbara Ferry, U.S. Census Partnership Data Services Specialist.

Staff's demographic screening is designed to identify the presence of minority and below-poverty-level populations within a six-mile area 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. Once 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.[4] When staff's screening analysis does not identify the population in the six-mile buffer to be an environmental justice population, as defined by *Environmental Justice: Guidance Under the National Environmental Policy Act*, no further scrutiny of this population 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 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 the minority population percentage 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 367,721 persons, with a minority population of 141,559 persons, or about 39 percent of the total population (US Census 2010a). The population in the six-mile buffer lives primarily within the cities of Huntington Beach, Costa Mesa, Fountain Valley, and Newport Beach, and to a much lesser extent, in the cities of Westminster and Santa Ana. **Socioeconomics Figure 2** shows the cities in and around the six-mile buffer. When compared with minority populations in the Census County Divisions (CCD) that encompass the project buffer and Orange County, the minority population in the six-mile buffer is less than the minority populations in these comparison geographies (**Socioeconomics Table 2**).

[4] The thirteen technical staff/areas are Air Quality, Hazardous Materials Management, Land Use, Noise and Vibration, Public Health, Socioeconomics, Soils and Surface Water Resources, Water Supply, Traffic and Transportation, Transmission Line Safety and Nuisance, Visual Resources, Cultural Resources, and Waste Management.

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**)	367,721	226,162	141,559	38.50
Costa Mesa (city)	109,960	56,993	52,967	48.17
Fountain Valley (city)	55,313	27,234	28,079	**50.76**
Huntington Beach (city)	189,992	127,640	62,352	32.82
Newport Beach (city)	85,186	70,142	15,044	17.66
Santa Ana (city)	324,528	29,950	294,578	**90.77**
Westminster (city)	89,701	22,972	66,729	**74.39**
Project Area CCDs*- Total	612,276	349,324	262,952	42.95
--North Coast CCD	366,151	197,280	168,871	46.12
--Central Coast CCD	246,125	152,044	94,081	38.22
Orange County	3,010,232	1,328,499	1,681,733	**55.87**
California	37,253,956	14,956,253	22,297,703	**59.85**

Notes: Bold text- minority population 50 percent or greater. *CCD - Census County Division.
Source: US Census 2010a.

Staff concludes that the minority population in the six-mile buffer is not meaningfully greater than the minority populations in the comparison geographies and therefore does not constitute an environmental justice population as defined by *Environmental Justice: Guidance Under the National Environmental Policy Act*, and would not trigger further scrutiny for purposes of an environmental justice analysis.

Below-Poverty-Level-Populations

The poverty status of households and individuals is determined based on a set of income thresholds, set by the U.S. Census Bureau, that vary by family size and composition. If the total income of the family is less than the family's threshold, that family and every individual in it is considered in poverty. 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 place level data from the 2008-2012[5] ACS Five-Year Estimates from the U.S. Census (US Census 2012a).[6] Within six miles of the HBEP, approximately ten percent, or 41,234 people, live below the federal poverty threshold.[7] **Socioeconomics Table 3** presents poverty data for the area in a six-mile buffer of the project site.

[5] Data has been updated to reflect the current poverty data released by the U.S. Census since the publication of the HBEP Preliminary Staff Assessment – Part A.

[6] Staff determined that the data at the place 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.

[7] ACS estimates for the tracts within a six-mile buffer of the project site were aggregated using the ACS calculator at the Oklahoma Department of Commerce, consistent with instructions received during the May 11 & 12, 2011 Census Workshop.

The Council on Environmental Quality (CEQ) and US EPA guidance documents identifies 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. As an initial indicator of whether a low-income population of sufficient size is present and would warrant status as an environmental justice community, 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 of Santa Ana and Westminster, Census County Divisions, and Orange 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
Cities Used to Determine Poverty Status-Total	437,448	±424	0.06	41,234	±4,446	3.61	9.60	±0.56	3.61
--Costa Mesa	108,776	±256	0.14	15,360	±1,527	6.04	14.10	±1.4	6.04
--Fountain Valley	55,360	±158	0.17	3,688	±648	10.68	6.70	±1.2	10.89
--Huntington Beach	190,448	±260	0.08	15,802	±1,550	5.96	8.30	±0.8	5.86
--Newport Beach	84,864	±148	0.11	6,384	±910	8.67	8.00	±1.0	8.92
Comparison Geographies									
Santa Ana (city)	319,512	±704	0.13	66,246	±3,290	3.02	20.70	±1.0	2.94
Westminster (city)	89,387	±316	0.21	13,644	±1,493	6.65	15.30	±1.7	6.75
Project Area CCDs**- Total	604,411	±1,748	0.18	69,533	±3,216	2.81	11.50	±0.53	2.80
--North Coast CCD	365,969	±1,293	0.21	36,797	±2,402	3.97	10.10	±0.7	4.21
--Central Coast CCD	238,442	±1,176	0.30	32,736	±2,139	3.97	13.7	±0.9	3.99
Orange County	2,985,156	±1,694	0.03	349,220	±7,939	1.38	1011.70	±0.3	1.56
California	36,575,460	±3,416	0.01	5,590,100	±38,396	0.42	15.30	±0.1	0.40

Note: * Population for whom poverty status is determined. **CCD – Census County Division.
Sources: US Census 2012a and OK Dept. of Commerce 2010.

Roughly ten percent of the population within six miles of the project site lives below the poverty level. Of the cities used to determine the poverty status within the six-mile buffer, the city of Costa Mesa stands out with 14 percent of the population living below the poverty level, compared with the three other cities' (Fountain Valley, Huntington Beach, and Newport Beach) more moderate 7 to 8 percent below-poverty-level population. By contrast, city of Santa Ana had 20.7 percent population below the poverty level. Other comparison geographies had percentages ranging from 12 percent for the project area CCDs to California's 15 percent. Staff concludes that the below-poverty-level population in the six-mile buffer is not meaningfully greater than the below-poverty-level population in the comparison geographies and does not constitute an environmental justice population as defined by *Environmental Justice: Guidance Under the National Environmental Policy Act*.

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

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: "[e]conomic and social changes resulting from the project shall not be treated as significant effects on the environment.", Section 15064(e) states that when "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. Emergency medical services, capacities, and response times are analyzed in the **WORKER SAFETY AND FIRE PROTECTION** section of this document.

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 Santa Ana-Anaheim-Irvine

Metropolitan Statistical Area (MSA[8]) (Orange County), Los Angeles-Long Beach-Glendale Metropolitan Division (Los Angeles 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.

Socioeconomics Table 4 shows the historical and projected populations for the cities within the six-mile buffer plus Orange County for reference. The city of Huntington Beach is projected to grow about eight percent between 2010 and 2035, compared with a more sizable growth of fourteen percent for Orange County. Population growth within the study area is projected to be concentrated in the cities of Huntington Beach and Fountain Valley.

Socioeconomics Table 4
Historical and Projected Populations

Population	Cities within the Project Study Area					Orange County
	Total	Costa Mesa	Fountain Valley	Huntington Beach	Newport Beach	
2000[1]	423,328	108,724	54,978	189,594	70,032	2,846,289
2010[2]	440,451	109,960	55,313	189,992	85,186	3,010,232
2020[3]	460,500	113,700	58,300	199,800	88,700	3,266,000[3] 3,198,279[4]
2035[3]	469,300	114,000	59,500	205,500	90,300	3,421,000[3] 3,311,811[4]
2040[4]	-	-	-	-	-	3,321,037[4]
2050[4]	-	-	-	-	-	3,324,920[4]
Projected Population Change 2010-2035						
Number	28,849	4,040	4,187	15,508	5,114	410,768*
Percent	6.15	3.67	7.57	8.16	6.00	13.65

Note: - Data not available. *Calculated using the highest 2035 population projection.
Sources: [1]US Census 2000, [2]US Census 2010b, [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 and Santa Ana-Anaheim-Irvine and Riverside-San Bernardino-Ontario MSAs would be more than adequate to provide construction labor for the project. **Socioeconomics Table 6** shows the project labor needs for each of the phases of construction compared with the total labor supply in the study area.

The applicant identified the primary trades required for the project’s demolition and construction as boilermakers, carpenters, electricians, ironworkers, laborers, millwrights, operators, and pipefitters (HBEP 2012a, pg. 5.10-9). The applicant has updated the project’s demolition and construction schedule, including an adjustment to the phasing of these activities from the AFC (HBEP 2013t). Demolition and construction activities are estimated to begin in the first quarter of 2015 with the demolition of the existing peaker (Unit 5), fuel tank area, and the stacks from Units 3 and 4. The construction of block 1 would follow beginning in the third quarter of 2016 and the construction of block 2 would begin in the third quarter of 2018. Units 1 and 2 are scheduled for demolition

[8] 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.

beginning in the fourth quarter of 2020 and construction would conclude with the construction of buildings 33 and 34 (control and maintenance) beginning in the third quarter of 2021 and wrapping up in the third quarter of 2022. The demolition and construction schedule overlaps a few months between each phase of construction during the 7.5-year demolition and construction period for the HBEP. The demolition of Units 3 and 4 is authorized under 00-AFC-13C and is not part of the HBEP. However, the demolition of Units 3 and 4 are considered in the HBEP cumulative setting. In preparation for construction of block 2, demolition of Units 3 and 4 is estimated to begin in the first quarter of 2016, with completion in the first quarter of 2018.

The peak month reported below in **Socioeconomics Table 6** is based on the demolition and construction reported in the revised table (Table 5.10-B-R1Construction and Demolition Personnel by Month) submitted in a response to staff's data request, Socioeconomics 40 (HBEP 2013e). The applicant later updated the project schedule and some of the activities in the first phase of the project. However, as staff did not receive an update to the table presenting the demolition and construction personnel by month, staff could not update the peak labor months for each phase of demolition and construction. Staff understands from the applicant that the number of overall construction and demolition personnel would not change from what was proposed in the AFC and revised table. The applicant would employ an average of 192 workers (HBEP 2012a, pg. 5.10-9). The workforce would peak during months 82 and 83 with 236 workers.

The applicant anticipates most of the construction workforce would come from Orange County or the neighboring counties of Los Angeles and Riverside and portions from other nearby counties in Southern California. However, for the purpose of this analysis, the applicant assumed that because of the size of the local construction workforce, the majority of construction workers would come from Orange County (HBEP 2012a, pg. 5.10-10). Energy Commission staff contacted the local building and construction trades council (Los Angeles/Orange Counties Building and Construction Trades Council [BCTC]) for more information about the local construction workforce in Orange County and Los Angeles County. BCTC staff, Ron Miller and Jim Adams explained that information from their local unions shows there are more than sufficient union members available within a commuting distance of the HBEP (BCTC 2012a). In addition, BCTC staff indicated the recession has caused huge unemployment in their trades with 15 to 40 percent unemployment in their local unions.

Socioeconomics Table 5
Total Labor by Skill in the Study Area: Santa Ana-Anaheim-Irvine MSA, Los Angeles-Long Beach-Glendale Metropolitan Division, Riverside-San Bernardino-Ontario MSA

Craft	Santa Ana-Anaheim-Irvine MSA (Orange County)				Los Angeles-Long Beach-Glendale Metropolitan Division (Los Angeles 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
Piling Crew	2,400 [1]	2,690	290	12.1	3,310 [1]	4,030	720	21.8	2,510 [1]	3,030	520	20.7
Carpenter	12,410	12,320	-90	-0.7	15,530	17,960	2,430	15.6	10,140	10,450	310	3.1
Laborer	11,900	12,700	790	6.6	23,160	27,810	4,650	20.1	11,870	13,380	1,510	12.7
Teamster	3,540 [2]	3,880	340	9.6	16,510 [2]	20,280	3,770	22.8	7,810 [2]	9,660	1,850	23.7
Electrician	4,880	5,150	270	5.5	10,310	11,360	1,050	10.2	4,000	4,520	520	13.0
Ironworker	380	390	10	2.6	1,130	1,270	140	12.4	700	670	-30	-4.3
Millwright	12,800 [3]	14,390	1,590	12.4	300	270	-30	-10.0	140	140	0	0.0
Boilermaker	59,590 [4]	61,660	2,080	3.5	240	280	40	16.7	52,650 [4]	57,040	4,390	8.3
Plumber	3,770 [5]	4,000	220	5.8	8,180 [5]	9,230	1,050	12.8	3,160 [5]	3,570	410	13.0
Pipefitter	3,770 [5]	4,000	220	5.8	8,180 [5]	9,230	1,050	12.8	3,160 [5]	3,570	410	13.0
Insulation Worker	250 [6]	270	20	8.0	93,060 [4]	108,580	15,520	16.7	52,650 [4]	57,040	4,390	8.3
Operating Engineer	2,400 [1]	2,690	290	12.1	3,310 [1]	4,030	720	21.8	2,510 [1]	3,030	520	20.7
Oiler/ Mechanic	12,800 [3]	14,390	1,590	12.4	34,450 [3]	39,640	5,190	15.1	11,260 [3]	13,030	1,770	15.7
Cement Finisher	1,760	1,930	170	9.7	2,420	3,020	600	24.8	2,420	2,570	150	6.2
Masons	1,760	1,930	170	9.7	2,420	3,020	600	24.8	2,420	2,570	150	6.2
Roofers	59,590 [4]	61,660	2,080	3.5	93,060 [4]	108,580	15,520	0.0	1,700	1,310	-390	-22.9
Sheet Metal Worker	950	960	10	1.1	2,230	2,320	90	4.0	1,440	1,580	140	9.7
Sprinkler Fitters	3,770 [5]	4,000	220	5.8	8,180 [5]	9,230	1,050	12.8	3,160 [5]	3,570	410	13.0
Painters	6,430	6,550	110	1.7	9,360	10,740	1,380	14.7	4,320	4,570	250	5.8
Sheetrockers	3,810 [8]	3,910	100	2.6	3,690 [8]	4,680	990	26.8	2,270 [8]	2,510	240	10.6

Notes: [1] Operating engineers and other construction equipment; [2] Industrial Truck and Tractor Operators; [3] Industrial Machinery Mechanics and [3] Maintenance and Repair Workers, General and [3] Maintenance Workers, Machinery; [4] Construction trades workers; [5] Plumbers, Pipefitters, and Steamfitters; [6] Insulation Workers, Floor, Ceiling, and Wall; [6] Insulation workers, mechanical.; [7] Helpers- Roofers; [8] Drywall and Ceiling Tile Installers; I & C - Control Room craft not included as data is not available.
Sources: HBEP 2012a Appendix 5.10B, Table 5.10B, EDD 2012.

Socioeconomics Table 6
Total Labor by Skill in the Study Area MSAs/MD versus Project Labor Needs

Study Area MSAs					HBEP Construction Workforce Needs- Peak Month by Phase						
Craft	Total Workforce (2010)	Total Projected Workforce (2020)	Growth from 2010		Craft		Demo Peaker & Tank Area	Construct Block 1	Construct Block 2	Demo Units 1 & 2	Construct Bldg 33 & 34 Control Bldg & Maintenance
					Demolition/ Construction Period*		Nov. 2014 to Dec. 2015 (14 mo.)	Feb. 2015 to June 2018 (41 mo.)	March 2018 to June 2020 (28 mo.)	Oct. 2020 to Sept. 2022 (24 mo.)	Aug. 2021 to Aug. 2022 (13 mo.)
			Number	Percent	Peak Month*		June 2015	April 2017	Aug & Sept 2021	March 2023	July 2022
Piling Crew	8,220	9,750	1,530	18.6	Piling Crew		0	10	10	0	0
Carpenter	38,080	40,730	2,650	7.0	Carpenter		0	20	25	20	8
Laborer	46,930	53,890	6,960	14.8	Laborer		30	25	30	8	10
Teamster	27,860	33,820	5,960	21.4	Teamster		8	8	8	0	4
Electrician	19,190	21,030	1,840	9.6	Electrician		0	18	25	3	10
Ironworker	2,210	2,330	120	5.4	Ironworker		0	25	12	3	8
Millwright	13,240	14,800	1,560	11.8	Millwright		0	8	6	4	0
Boilermaker	112,480	118,980	6,500	5.8	Boilermaker		4	20	15	0	0
Plumber	15,110	16,800	1,690	11.2	Plumber		0	10	14	0	4
Pipefitter	15,110	16,800	1,690	11.2	Pipefitter		0	12	12	2	6
Insulation Worker	145,960	165,890	19,930	13.7	Insulation Worker		2	8	8	3	4
Operating Engineer	8,220	9,750	1,530	18.6	Operating Engineer		3	15	15	2	4
Oiler/ Mechanic	58,510	67,060	8,550	14.6	Oiler/ Mechanic		2	4	4	0	4
Cement Finisher	6,600	7,520	920	13.9	Cement Finisher		0	10	12	0	6
Masons	6,600	7,520	920	13.9	Masons		0	0	0	0	4
Roofers	154,350	171,550	17,200	11.1	Roofers		0	6	8	0	0
Sheet Metal Worker	4,620	4,860	240	5.2	Sheet Metal Worker		0	8	8	0	6
Sprinkler Fitters	15,110	16,800	1,690	11.2	Sprinkler Fitters		0	8	8	0	5
Painters	20,110	21,860	1,750	8.7	Painters		0	6	6	0	6
Sheetrockers	9,770	11,100	1,330	13.6	Sheetrockers		0	0	0	0	6
I & C-Control Room	-	-	-	-	I & C-Control Room		0	0	0	0	8
					Total	Craft	47	205	216	45	75
						Supervision	4	25	20	5	4
						Workforce	51	230	236	50	79

Notes: - Data not available. *Dates, duration, and peak month based on Table 5.10.B-R1 (HBEP 2013e).
Sources: HBEP 2013e; EDD 2012.

Energy Commission staff considers the majority of construction workers would commute daily to the project site and a small workforce, about ten percent (24 workers at peak construction), would come from outside of the local commute area.

Currently, 33 workers are employed at the Huntington Beach Generation Station (HBEP 2013g). HBEP would require 33 full-time employees during project operation; one plant manager, one operations leader, one maintenance leader, one environmental engineer, one maintenance planner, twenty power plant operators, five controls specialty workers, two mechanics and one administrative worker (HBEP 2012a, pg. 5.10-13). The number of workers by job type needed for the HBEP is different from the existing workforce at the Huntington Beach Generating Station. While it seems reasonable that some or even most of the existing workforce would be employed by the new facility, staff is not aware of any labor agreement. If any of the existing employees work at the new facility, the number of new workers needed would be less than 33. The reduction in new workforce hired would not change this staff analysis. The applicant anticipates most of the facility employees would be drawn from the local population within Orange County, although some facility employees may commute from other neighboring counties on a daily basis or choose to relocate permanently to Huntington Beach or Orange County. **Socioeconomics Table 7** presents the occupational employment projections by occupation type for the Santa Ana-Anaheim-Irvine MSA. Based on these employment projections, there would be sufficient labor to supply project operational staffing needs.

Socioeconomics Table 7
2010 to 2020 Occupational Employment Projections:
Santa Ana-Anaheim-Irvine MSA

Occupational Title	Average Annual Workforce		Employment Change			Project Operations Staff	
	2010	2020	Number	Percent			
Industrial Production Managers	2,300	2,380	80	3.5		Plant Manager	1
General and Operations Managers	25,280	25,540	260	1.0			
General and Operations Managers	25,280	25,540	260	1.0		Operations Leader	1
Supervisors of Installation, Maintenance, and Repair Workers	3,670	3,990	320	8.7		Maintenance Leader	1
Environmental Engineers	450	580	140	31.1		Environmental Engineer	1
Electrical and Electronic Equipment Mechanics, Installers, and Repairers	8,090	8,650	560	6.9		Maintenance Planner	1
Plant and System Operators	920	990	70	7.6		Power Plant Operator	20
Control and Valve Installers and Repairers, Except Mechanical Door	530	570	40	7.5		Controls Specialty	5
Electrical and Electronic Equipment Mechanics, Installers, and Repairers	8,090	8,650	560	6.9		Mechanic	2
Industrial Machinery Mechanics	1,470	1,730	260	17.7			
Secretaries and Administrative Assistants	42,440	47,140	4,690	11.1		Admin	1
Office Clerks, General	31,770	36,420	4,660	14.7			

Source: EDD, 2012a.

Staff considers the majority of permanent workers would be hired locally and conservatively a small non-local workforce, about ten percent (24 workers at peak construction), may be hired from outside of the local commute area. The few non-local workers hired for the project would likely move permanently to the area. The additional new residents would not create a substantial population influx in an area where the population within the six-mile buffer totals 440,451 (see **Socioeconomics Table 4**).

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 create a less than significant impact.

Housing Supply

Socioeconomics Table 8 presents housing supply data for the project area. As of April 1, 2010, there were 183,480 housing units within a six-mile buffer of the project site with a vacancy of 11,850 units, representing a 6.5 percent vacancy rate. A five percent vacancy is industry-accepted as a 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 in a six-mile buffer of the project site.

Socioeconomics Table 8
Housing Supply in the Project Area

Subject	Area			
	Cities in a Six Mile Buffer of Project Site		Orange County	
	Number	Percent	Number	Percen t
OCCUPANCY STATUS				
Total housing units	183,480	100	1,048,907	100
--Occupied housing units	171,630	93.5	992,781	94.6
--Vacant housing units	11,850	6.5	56,126	5.4
VACANCY STATUS				
Vacant housing units	11,850	100	56,126	100
--For rent	4,916	41.5	25,254	45
--For sale only	1,200	10.1	8,434	15
--Other**	5,734	48.4	22,438	40.0

Notes: *Cities include Costa Mesa, Fountain Valley, Huntington Beach, and Newport Beach. **Other includes other miscellaneous vacancy status types reported in US Census QT-H1 table.
Source: US Census 2010c

Orange County has a large supply of lodging options with about 500 hotels and 55,000 rooms (AnaheimOC 2012). In Huntington Beach, there are 21 hotels/motels with total of 1,926 rooms and 177 suites (HB Marketing & Visitors Bureau 2012a). Alternative lodging options include recreational vehicle camping sites. In Huntington Beach, there are three recreational vehicle camping sites, two operate year round and the third operates from October 1st through May 31st (HB Marketing & Visitors Bureau 2012b). Between the two year-round sites, there are 147 spaces with electric, water, and dump out amenities, and 10 overflow spaces without hookups. The seasonal campsite offers 47 spaces with electric, water, and dump out amenities.

Given the large supply of lodging choices in Huntington Beach and Orange County and the estimated 10 percent non-local project construction workers (peak estimate- 24 non-local workers), staff expects no new housing would be required as a result of the project.

The project would require 33 full-time employees during project operation. The majority of these workers are expected to commute to the project site daily. Staff estimates that three workers would relocate to the immediate project area. The three new residents would not impact the housing supply in the area.

Staff concludes the project's construction and operation workforce would not have a significant adverse impact on the housing supply in the project area, Huntington Beach or Orange County and therefore, the project would create a less than significant impact.

Displace Substantial Numbers of Existing Housing and People

The HBEP is proposed on the site of the existing AES Huntington Beach Generating Station, replacing the existing power plant, so 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 HBEP would not cause significant impacts to service ratios, response times, or other performance objectives relating to law enforcement, schools, or parks.

Law Enforcement

The HBEP proposed project site is located within the jurisdiction of the city of Huntington Beach Police Department (HBPD). Their single station serves as headquarters and is located at 2000 Main Street; approximately 3.5 miles from the HBEP site. HBPD's staff includes 200 sworn police officers and 115 civilians (HBPD 2012a). HBPD has a minimum standard of 10 sworn officers per shift and a service standard of 1.1 officers per 1,000 in population. Based on the 2010 population count in Huntington Beach, a staff of approximately 209 officers would meet HBPD's service standard. With 200 officers, HBPD is slightly understaffed based on their service standards. HBPD has a formal mutual aid agreement throughout Orange County law enforcement agencies (HBPD 2012a).

Staff contacted HBPD to discuss the proposed project, ascertain their ability to provide law enforcement services to the project, and solicit comments or concerns they might have about the project. Lieutenant Thomas Donnelly does not anticipate the project would trigger the need for additional law enforcement services or affect emergency response times (HBPD 2012a). Lieutenant Donnelly estimates a response time of seven minutes to the project site for priority calls and 30 minutes to the project site for non-priority calls.

The California Highway Patrol (CHP) is the primary law enforcement agency for state highways and roads. The city of Huntington Beach includes segments of the 405 freeway, Beach Boulevard (State Route 39), and Pacific Coast Highway. The CHP is the primary law enforcement agency for the 405 freeway and both CHP and HBPD serve the portions of Beach Boulevard and Pacific Coast Highway within the city of Huntington Beach. CHP services include law enforcement, traffic control, accident investigation and the management of hazardous material spill incidents. The nearest CHP office is located in Westminster (CHP 2012). 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, 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 create a less than significant impact.

Education

The HBEP site is located within the Huntington Beach Elementary City School District (HBCSD) and the Huntington Beach Union High School District (HBUHSD). HBCSD provides kindergarten through eighth grade education at six elementary schools and two middle schools with a combined enrollment of 7,002 students for the 2013/2014[9] school year (CDE 2014). HBUHSD provides 9th grade through12th grade education at seven high schools, one day-school, one continuation school, and a non-public non-sectarian school with a combined enrollment of 16,431 students for the 2013/2014 school year (CDE 2014). **Socioeconomics Table 9** presents the current enrollment data for the HBCSD and HBUHSD and enrollment for the 2013/2014 school year and the average pupil-to-teacher ratio, and average classroom size for the previous school years for both the school districts. Correlating data for Orange County is provided for reference.

[9] Data has been updated to reflect the current education data released by the California Department of Education since the publication of the PSA, Part A.

Socioeconomics Table 9
Current School District Data

	Year	Enrollment	Pupil-to-Teacher Ratio	Average Class Size
Huntington Beach City Elementary School District	2013/2014	7,002	-	-
	2012/2013	7,056	26.7	29.8
	2011/2012	7,124	27.9	30.3
	2010/2011	7,002	31.6	29.0
Huntington Beach Union High School District	2013/2014	16,431	-	-
	2012/2013	16,400	25.8	25.3
	2011/2012	16,442	26.0	24.7
	2010/2011	16,317	27.2	25.2
Orange County*	2013/2014	500,487	-	-
	2012/2013	501,801	25.8	28.3
	2011/2012	502,205	25.5	28.8
	2010/2011	502,895	26.4	29.0

Notes: * Includes both elementary and high school districts. – Data not available.
Source: CDE 2014.

Based on the pupil-to-teacher ratio and the average class size for both school districts compared with the corresponding data for Orange County, presented in **Socioeconomics Table 9** above, both the HBCSD and HBUHSD appear slightly more crowded than Orange County. Staff contacted HBCSD staff to ascertain their district capacity. HBCSD is tightly staffed so additional students can quickly be considered overflow students and would need to be sent to another school within their district (CEC 2012i). At the elementary school level, the California Department of Education (CDE) sets a pupil to teacher cap and allows class size exceptions through waivers. This classroom cap enables Energy Commission staff to gage an elementary school district's capacity. The CDE allows a pupil to teacher ratio of 33:1 for Kindergarten and under the Education Code, 33 students are allowed in a single Kindergarten class as long as the district does not exceed an overall Kindergarten average of 31 students. HBCSD does not have a waiver for Kindergarten. HBCSD has obtained Class Size Waivers from the CDE for a 32:1 ratio for grades first through third where no class can be larger than 32 students, and a 32:1 ratio for grades fourth through eighth on average district-wide (CEC 2012i). Unlike the elementary schools, high schools do not have a pupil to teacher cap that staff can use to ascertain district capacity. Staff contacted HBUHSD staff to ascertain district capacity and was told that one high school is close to capacity (Fountain Valley High School) and the rest of the schools are not at capacity (CEC 2013a).

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 Orange County area. Based on a peak employment of 236 workers during months 88 and 89, approximately 24 new residents could temporarily relocate closer to the project site. 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 adverse impact to the schools from construction of the proposed project.

Thirty-thee workers are needed to operate the HBEP; most would likely be hired locally and a few would relocate closer to the project site. With an average family size of 2.99 (assuming a two-adult household) in Orange County, and an estimated three workers relocating closer to the project site, approximately three children could permanently relocate within these two school districts (US Census 2010c). Even under this scenario, the possible addition of three students when compared with the HBCSD and HBUHSD enrollments would not constitute a substantial school population growth and by extension would not necessitate the provision of new or physically altered government facilities (e.g. schools) in order to maintain acceptable service ratios.

Parks

Huntington Beach has 73 parks and public facilities totaling 778 acres, offering such amenities as playground equipment, dog park, amphitheatre, picnic facilities, exercise course, sports fields (e.g. softball and soccer), nature center, fishing, lakes, horseshoes, equestrian trails, sports courts (e.g. volleyball, basketball, tennis, racquetball, and handball) (HB City 2012b). The closest parks to the project site are Edison Community Park and Eader Park. Of the 778 acres of parkland, 208 acres are public beach. Other recreational facilities include the Edison Community Center, Huntington Central Park Sports Complex, city gym and pool, Murdy Community Center, Newland House Museum, and Rodgers Senior Center.

The city has a park standard of five acres per 1,000 people (HB City 1996). ACS five year data (2008-2012) show the estimated population in Huntington Beach as 191,403[10] (US Census 2012b). Based on this current estimate, approximately 957 acres of parks would be needed to meet the park standard. The city currently has 778 acres of parks.

Staff's analysis shows there would not be a large number of workers moving into the project area during project construction or operation and therefore, there would be little, if any increase in the usage of or demand for parks or other recreational facilities.

Staff concludes the project would not result in substantial adverse 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 parks. The project would not increase the use of neighborhood or regional 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. For the above reasons, staff concludes the project would have a less than significant impact on neighborhood or regional parks and recreational facilities.

[10] Five-Year ACS Estimate for population in Huntington Beach is 191,403, with a margin of error of +/-82, and a coefficient of variation of 0.03.

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].

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.

As a result of the large labor supply in the Orange County and Los Angeles area and the mobility of the labor supply, staff included projects in Orange County and the cities within the county that would likely employ a similar workforce to the HBEP as part of the project's cumulative impact analysis for socioeconomics.

Staff contacted planning staff with Orange County, Huntington Beach, and the cities adjacent to Huntington Beach (Costa Mesa, Newport Beach, Westminster, Santa Ana, and Fountain Valley) to develop a list of large residential development, industrial, and commercial projects that could have construction schedules overlapping with the HBEP. The applicant anticipates that if the HBEP were approved, the project's 7.5-year demolition and construction period would begin in the first quarter of 2015.

Staff considers the following projects in **Socioeconomics Table 10** part of the cumulative setting for socioeconomic resources. Construction timing is estimated based on the best information available during the preparation of this analysis.

Socioeconomics Table 10
Cumulative Projects

Project Name	Location	Status	Estimated or Actual Construction State Date & Duration	Project Description
International West Hotel East (Site C)	NW corner Harbor Blvd & Twintree Ln, Garden Grove	Approved Dec. 2012	Construction estimated to start between August and October 2013 with a 24 to 30-month construction period.	One full-service hotel and two limited-service hotels, with a total of 769 rooms.
Water Park	Garden Grove	Approved	Construction estimated to start in August 2013 with a 24 to 30-month construction period.	100,000 sq. ft. indoor water park, 600-room hotel, 4+ level parking garage.
Beach Walk	19891 & 19895 Beach Blvd., Huntington Beach	Approved, March 2012, construction permits anticipated April 2013	April 2013 with 1 to 1.5 year construction period.	173 apartment units within a four-story building.
Beach and Ellis Project- Elan Apartments	18502 &18508 Beach Blvd., Huntington Beach	Approved, demo existing gas station completed, demo permits pending for existing 2-story commercial bldg	1 to 2 year construction period	274- unit apartments, including 8,500 sq. ft. of commercial property and 48,000 sq. ft. of open space.
The Boardwalk (fka Murdy Commons)	7441 Edinger Ave, Huntington Beach	Approved Feb. 2011, construction permits anticipated May 2013	May 2013 with completion in 2016/2017	487 apartment units and 14,500 sq. ft. commercial area on 12.5 acres.
Huntington Beach Generating Station (Demolition of Units 3 & 4)	HBEP project site, Huntington Beach	Approved	First quarter 2016 to first quarter 2018 (27 months)	Demolition/ Removal of Units 3 & 4 from the existing Huntington Beach Generating Station
Huntington Beach Lofts	7302-7400 Center Ave, Huntington Beach	Approved Sept. 2008. In plan check/building permits	May 2013 with 2-year construction period	385 apartment units with 10,000 sq. ft. retail on 3.8 acres.
Pacific City	21002 Pacific Coast Highway, Huntington Beach	Approved 2004. Pending building permits	Construction estimated late 2013 / early 2014 with a 3-year construction period.	516 apartments, commercial, retail, and hotel (250-room, 8 stories).
Poseidon Desalination Plant	HBGS facility, Huntington Beach	Approved by city in 2006, pending California Coastal Commission action	Summer 2014 to Summer 2017	Seawater intake pretreatment facilities.

Project Name	Location	Status	Estimated or Actual Construction State Date & Duration	Project Description
17872 Cartwright, Metropolis residential project	17872 Cartwright, Irvine	Approved	Late Summer/early Fall 2013 start of construction, 18 to 20-month construction period	457-unit (5+stories) residential project.
2501 Alton, Alton & Millikan Apts, Phase II	2501 Alton, Irvine	Under review	Mid 2014 with a 15-month construction period	154-unit apartments.
2801 Kelvin	2801 Kelvin, Irvine	Under review	18-month construction period	384-unit apartments.
Campus and Jamboree	Northwest corner of Campus and Jamboree, Irvine	Revised application received on June 18, 2013. Phased construction and development (3 Phases). First phase submitted for approval in next few months for approximately 400 residential units.	Built in three phases. The first phase is primarily residential. Construction estimated to start on phase 1 in mid 2015 with a.20-24 month construction period. The second phase is predominantly residential, but moving into retail. Estimated 15-month const period beginning mid/end 2016. The third phase has some residential and the majority is retail. The earliest construction can begin is 2017, but existing retail is still under lease, where some leases do not expire until 2020.	Master plan, park plan, and development agreement, 1,600 residential units (5 to 6-story apartments), 17,000 sq. ft. plus primary retail in the Irvine Technology Center, and up to 23,000 square feet of accessory retail and/or residential-serving amenities, 1 acre public park, and two 0.5-acre public plazas.
Jamboree /Michelson SEC	Jamboree/ Michelson, Irvine	Approved. Estimate bldg permits mid May 2013	Mid May 2013	987-unit apartments.
Laguna Canyon Rd. & Old Laguna Canyon Rd.	Laguna Canyon Rd. and Old Laguna Canyon Rd., Irvine	Under review. Estimate early Summer hearing date	Possible Summer 2013 construction start, 1 to 2 year construction period	256 to 258 single family dwelling units.
Pacifica and Spectrum NWC	Pacifica and Spectrum, Irvine	Approved Aug. 16, 2012	Estimated 24-month construction period	573-unit apartments.
Irvine Center Drive and Alton, NWC.	Irvine Center Drive and Alton, Irvine	Approved Aug. 16, 2012	Estimated 24-month construction period	766-unit apartments.

Project Name	Location	Status	Estimated or Actual Construction State Date & Duration	Project Description
Spectrum Lots 105, 107, and 108	Irvine Spectrum, Irvine	Approved Summer 2012. Not in hurry to build as developer is currently constructing approx. 3,000 units.	No planned date for construction, unknown construction period	Development of up to 1,350 multi-family residential units
City of Newport Beach General Plan Update EIR	North Newport Center Planned Community, Newport Beach	Amendment approved Aug. 2012	End of 2014 with an 18-month construction period	Amendment to increase unbuilt multi-family residential development allocation from 430 units to 524 units on 121 acres.
Newport Beach City Hall Reuse Project	Via Lido/Newport Blvd, Newport Beach	Mitigated Neg. Dec., Nov. 2012 for land use change. Additional enviro. review needed once development plan finalized	Early 2015 with a 1.5 to 2 year construction period	The mixed use land use that could include up to 15,000 sf. of retail commercial or a community center and up to 99,675 sf. for hotel use (120-130 rooms).
Uptown Newport Village Specific Plan Project	Jamboree Rd. and Fairchild Rd., Newport Beach	Draft FEIR submitted Nov. 2012	Two phases of construction. Phase 1 2014 to 2017. Phase 2 Spring 2017 to 2021. Phase 2 construction start contingent on existing building lease set to expire March 2017, but has the option to extend the lease to 2027.	Mixed-use project with 1,244 residential units, 11,500 sq. ft. of retail, and a 2-acre park.
The 301	301 Jeanette Lane, Santa Ana	Under review	2014 with an 18 to 24 month construction period	182 residential units.
Bristol St. Widening	Bristol Street, Santa Ana	Phase 1 complete out of four phases	Phase 2 out to bid with 11-month construction period. Phase 3 June 2015 to June 2016. Phase 4 currently unfunded.	Widening to six lanes.
Grand Avenue Widening	Grand Avenue, Santa Ana	Approved	July 2015 to March 2016.	Widening to six lanes.
The Met	200 East First American, Santa Ana	Approved 2012	Fall 2013 with an 18 to 24 month construction period	271 residential units, approximately 2,000 sq. ft. retail.
Warner Avenue Widening	Warner Avenue, Santa Ana	Approved	Construction in four phases. Phase 1 Jan. 2016 to Jan 2017.	Widening to six lanes.

Project Name	Location	Status	Estimated or Actual Construction State Date & Duration	Project Description
I-5 / Ortega Highway (SR-74) Interchange Improvement Project	I-5 & SR-74 interchange, City of San Juan Capistrano	Approved, 2009	Early 2013 until Spring 2015	Realign Ortega Highway west of the I-5 southbound ramps and widen I-5 southbound off-ramp.
I-5 Central County Improvement Project	I-5 between SR-55 and SR-57, cities of Santa Ana, Tustin and Orange.	Environmental review. Draft environmental document is estimated to be released Spring 2013	Late 2015 to late 2017	Add second carpool lane in each direction on I-5 between the SR-55 and the SR-57. Increase weave length between southbound I-5 First Street on-ramp and southbound SR-55 connector.
I-5, SR-73 to El Toro Road	I-5 between SR-73 to El Toro Rd, cities of Laguna Hills, Laguna Woods, Laguna Niguel, Mission Viejo, Lake Forest, and San Juan Capistrano.	Environmental review.	2018 to 2022	Widen the I-5 to accommodate general purpose lanes in each direction. Reestablish existing auxiliary lanes. Extend second carpool lane from El Toro Rd. to Alicia Parkway in both directions and modify ramps as needed. Reconstruct Avery Parkway and La Paz Rd. interchanges.
Avenida Pico to San Juan Creek Road	I-5 between Avenida Pico and San Juan Creek Rd, cities of San Clemente, and San Juan Capistrano, Dana Point.	Approved, 2011	2013 to 2017	Add carpool lane both directions on I-5 between Avenida Pico to San Juan Creek Road. Improve sight distance on southbound horizontal curve north of PCH. Reconstruct interchange at Avenida Pico. Widen northbound Avenida Pico on-ramp to three lanes. Provide dual left-turn lanes to both northbound and southbound Avenida Pico on-ramps. Add soundwalls where needed.
Interstate 405 Improvement Project	Interstate 405 between SR-73 and I-605, cities of Seal Beach, Huntington Beach, Westminster, Fountain Valley, and Costa Mesa.	Final environmental doc. being prepared	2015 to 2019	Widen I-405 between SR-73 and I-605.

HBEP would employ an average of 192 workers per month during the 7.5-year demolition and construction period. Construction workforce would peak during months 82 and 83 with 236 workers onsite. Once operational, the HBEP would permanently employ 33 workers. Approximately ten percent of the workforce is anticipated to be non-local and would likely relocate closer to the project site. **Socioeconomics Table 11** presents the total labor force for the crafts specifically needed for the construction of HBEP. As shown in the table, the labor force within the Santa Ana-Anaheim-Irvine MSA and the surrounding MSAs are more than sufficient to accommodate the labor needs for construction and operation of the HBEP including other future planned projects in the cumulative study area.

Socioeconomics Table 11
Total Labor Supply for Selected MSAs/MD

Total Labor for Selected MSAs/MD (**Construction Workforce**)*	**Total Workforce for 2010**	**Total Projected Workforce for 2020**	**Growth from 2010**	**Percent Growth from 2010**
Santa Ana-Anaheim-Irvine MSA	208,960	219,470	10,510	5.0
Los Angeles-Long Beach-Glendale Metropolitan Division	339,030	395,560	56,530	16.7
Riverside-San Bernardino-Ontario MSA	180,290	197,810	17,520	9.7
TOTALS	728,280	812,840	84,560	11.6
Total Labor for the Santa Ana-Anaheim-Irvine MSA (**Operations Workforce**)**	**Total Workforce for 2010**	**Total Projected Workforce for 2020**	**Growth from 2010**	**Percent Growth from 2010**
Operational Power Plant Workforce	116,920	127,990	11,070	9.47

Note: Total workforce includes only the crafts specifically needed for the HBEP. *See **Socioeconomics Table 6** for a list of crafts included in the total construction workforce figures. **See **Socioeconomics Table 7** for a list of occupations included in the total power plant workforce figures.
Source: EDD 2012

As there is a large supply of lodging choices in Huntington Beach and Orange County and there is sufficient housing supply, staff does not anticipate the project's limited increase in area population would create a significant reduction in the housing supply. A few operational workers would relocate closer to the project site (approximately ten percent) which could add about three children between the HBCSD and HBUSD. The few additional children would be a minimal addition. Staff's proposed Condition of Certification **SOCIO-1** would ensure applicable school fees are paid by the project. The increased usage of neighborhood or regional parks or other 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 would not increase the demand for law enforcement services.

Staff concludes the proposed HBEP would not result in any significant and adverse cumulative impacts on population, housing, schools, parks and recreation, or law enforcement. **Socioeconomics Table 11** shows there is a more than sufficient workforce available for the HBEP project plus other future planned projects. Therefore, for the reasons discussed above, staff does not expect the construction or operation of the HBEP to contribute to any significant adverse cumulative socioeconomic impacts.

COMPLIANCE WITH LORS

SCHOOL IMPACT FEES

The statutory school fees, as authorized under Section 17620 of the Education Code, are collected and distributed by the HBUHSD for both their district and the HBCSD combined. The rate for the 2011-2012 fiscal year for new commercial or industrial development for the two districts combined is $0.47 per square foot of covered and enclosed, non-residential space (Jameson & Boomer 2012). The applicable fees are calculated prior to the issuance of building permits during plan review. Based on the preliminary project design, approximately 18,200 square feet would be considered chargeable covered and enclosed space (HBEP 2012a, pg. 5.10-15). Based on this preliminary estimate, approximately $8,554 in school fees would be assessed for HBCSD and HBUHSD combined. Staff is proposing Condition of Certification **SOCIO-1** to ensure the payment of fees to these school districts. HBEP would be in compliance with Section 17620 of the Education Code through the one-time payment of statutory school impact fees to the Huntington Beach City Elementary School District and Huntington Beach Union High School District.

CITY OF HUNTINGTON BEACH LORS

Title 17 (Buildings and Construction) in the Huntington Beach Municipal Code outlines several development impact fees that city staff (Mr. Aaron Klemm, Energy Project Manager) indicated are applicable to the HBEP if the city were the permitting authority. Chapter 17.67 (Library Development Impact Fees), Chapter 17.74 (Fire Facilities Development Impact Fee), Chapter 17.75 (Police Facilities Development Impact Fees), and Chapter 17.76 (Parkland Acquisition and Park Facilities Development Impact Fees) are applicable to the project (CEC 2012j). The Fire Facilities Development Impact Fee is discussed in the **WORKER SAFETY AND FIRE PROTECTION** section of this document.

Staff has been working with Ms. Jane James, Planning Manager with the city of Huntington Beach and Mr. Klemm to discuss the method of assessment for the development impact fees (CEC 2013c). Mr. Klemm provided staff with the current rate (effective September 2, 2012) for the development impact fees and guidance on how the city would apply those rates if they were the permitting authority. The rate is assessed at a per square foot basis according to land use (Industrial/Manufacturing Uses). Ms. James and Mr. Klemm initially informed staff that the structures of the HBEP that would be assessed would include the footprint of the power blocks, HRSGs, cooling towers, and administration buildings. Staff notes that the city of Huntington Beach adopted development impact fees under Title 17 in August 2012, and has yet to assess projects similar to the proposed HBEP for development impact fees. Since the publication of the HBEP Preliminary Staff Assessment – Part A (HBEP PSA - Part A), Ms. James notified Energy Commission staff and the applicant during a workshop for the HBEP PSA - Part A that the calculation of the development impact fees would be now based on the gross square footage of buildings.

In addition to working with city staff, Energy Commission staff reviewed the general information on development impact fees (Chapter 17.73) and notes under the definitions (17.73.010), item (j), the HBEP fits the definition of an industrial development project which means "…the construction of new Floor Area on a lot in any of the Non-Residential Zoning Districts of the City." Also, under item (m), "'Development' means the addition of new dwelling units and/or new nonresidential square footage to an undeveloped, partially developed or redeveloped site and involving the issuance of a building permit and certificate of occupancy for such construction, reconstruction or use."

The information below outlines the applicable development impact fees. A development impact fee fund is established for each of the development impact fees listed below. The applicable development impact fees also include the Fire Suppression Facilities Development Impact Fee that is discussed in the **WORKER SAFETY AND FIRE PROTECTION** section of this document.

- Chapter 17.67 of the Huntington Beach municipal code - Library Development Impact Fees (HB City 2012a). There is no fee in the current adopted Huntington Beach Fee Resolution for industrial/manufacturing land uses under the Library Development Impact Fees.
- Chapter 17.75 of the Huntington Beach municipal code - Police Facilities Development Impact Fees. The intent of this development impact fee is to assure that new development in the city of Huntington Beach pay a fair share of the proportional facility and equipment and vehicle costs required to support needed police facilities and related costs necessary to accommodate such development. The current rate for the Police Facilities Development Impact Fees for industrial/manufacturing land uses is $0.133 per square foot. Staff proposes Condition of Certification **SOCIO-2** to ensure the applicable fees are paid to the city of Huntington Beach in accordance with Chapter 17.75 of the Huntington Beach municipal code.

Pursuant to the Development Impact Fee Calculation and Nexus Report for the City of Huntington Beach, dated October 2011, as amended April 27, 2012, the fees are derived from, based upon, and do not exceed the costs of providing additional police services attributable to applicable new nonresidential development.

- Chapter 17.76 of the Huntington Beach municipal code- Parkland Acquisition and Park Facilities Development Impact Fees. The intent of this development impact fee is to assure that new development in the city of Huntington Beach pay a fair share of the proportional costs for the acquisition, relocation and expansion of parkland, park development and community use facilities and related costs necessary to accommodate such development. The current rate for the Parkland Acquisition and Park Facilities Development Fees for industrial/manufacturing land uses is $0.393 per square foot. Staff proposes Condition of Certification **SOCIO-2** to ensure the applicable fees are paid to the city of Huntington Beach in accordance with Chapter 17.76 of the Huntington Beach municipal code.

Pursuant to the Development Impact Fee Calculation and Nexus Report for the City of Huntington Beach, dated October 2011, as amended April 27, 2012, the fees are derived from, based upon, and do not exceed the costs of parkland acquisition, park development and community facilities attributable to applicable new nonresidential development.

The method of assessment for the development impact fees, timing of collection of these fees, and staff-proposed Condition of Certification **SOCIO-2** were discussed during a project workshop held for the HBEP PSA - Part A. These issues were included, along with the applicant's comments and the revised verification section of Condition of Certification **SOCIO-2** in the "Issues and Resolution" subsection of the HBEP PSA - Part A - Supplemental Focused Analysis. Condition of Certification **SOCIO-2** under the "Proposed Conditions of Certification" subsection reflects the edits agreed upon by the three parties.

ESTIMATED FEES FOR HBEP

Ms. James, city of Huntington Beach staff, notified Energy Commission staff and the applicant during the workshop for the HBEP PSA - Part A that the city's development impact fees would be calculated based on the gross square footage of buildings, instead of the footprint of the power blocks, HRSGs, cooling towers, and administration buildings previously reported by the city. Based on the current design, the applicant estimates the total area of the two new buildings (New Building No. 33-control/administration and New Building No. 34- maintenance/warehouse) at 18,720 square feet (HBEP 2013mm).

NOTEWORTHY PUBLIC BENEFITS

For the purpose of this analysis, staff defines noteworthy public benefits to include changes in local economic activity and local tax revenue that would result from project construction and operation. To assess the gross economic value of the proposed project, the applicant developed an input-output model using proprietary cost data and the IMPLAN Professional 3.0 software package. The assessment used Orange County as the unit of analysis, assuming that expenditures made outside of the county represent economic leakage. Impact estimates reflect two different scenarios representing the demolition and construction phase and the operations phase of the project. For both phases, the applicant estimated the total direct, indirect, and induced economic effects on employment and labor income.[11] Direct economic effects represent the employment, labor income, and spending associated with demolition, construction, and operation of the project. 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.

[11] The Minnesota IMPLAN Group (2012) defines Economic Output as "the value of industry production." In the manufacturing sector, output is equal to total sales, minus inventory changes. For the service sectors, output is equal to total sales. In the retail and wholesale trade sectors, output is equal to the gross margin (i.e. total sales, minus the cost of goods sold).

There are several important caveats to note with regard to input-output analysis and the IMPLAN model. First, the purpose of the analysis is to construct a reasonable profile of the project related investments and to demonstrate the overall magnitude and direction of the economic benefits that would accrue to the surrounding economy. The resulting estimates do not represent a precise forecast, but rather an approximate estimate of the overall economic effect. The IMPLAN model is a static model, meaning that it relies 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 peaker (unit 5), fuel tank, and the stacks from Units 3 and 4 would not begin until the first quarter of 2015 and completion of construction would not occur until the third quarter of 2022. 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.

Pages 5.10-11 to 5.10-14 of the AFC summarize the investment, or expenditure, profile used for the applicant's IMPLAN analysis. According to these figures, the total anticipated capital cost is between $500 and $550 million. This includes costs associated with demolition of existing units 1, 2, and 5, as well as construction of Power Blocks 1 and 2. Materials and equipment costs for demolition and construction would equal around $61.2 million. Around 74 percent of the materials and equipment spending, roughly $45 million would occur within Orange County. Based on an average hourly rate of $83 per worker, the total labor cost (including benefits) for demolition and construction would equal $241.4 million. Around 90 percent of the demolition and construction labor would come from within Orange County. This would equal $217.3 million in gross labor income to Orange County workers. According to the applicant, annual operation of the proposed project would require an estimated 33 full-time equivalent employees. At an estimated average salary of $131,920 per year, this would equal roughly $4.35 million per year in operations payroll (including benefits). Annual non-payroll operations and maintenance (O&M) costs for the HBEP would equal around $4.45 million. While the applicant assumes that 100 percent of the annual O&M expenditures would be made within Orange County, they acknowledge the likelihood that some portion of the annual O&M budget would be spent in neighboring counties. Therefore, staff anticipates that the benefits to Orange County of non-payroll O&M spending may be somewhat less than estimated.

Socioeconomics Table 12 reports the applicant's estimates of the economic impacts that would accrue to Orange County due to project construction and operation. Note that the table reports economic impact estimates on an annualized basis. All jobs are reported in job-years and must be interpreted with caution.[12] During the 90-month construction period, the project would generate almost 380 jobs (direct, indirect, and induced) and $251 million in labor income (direct, indirect, and induced). The average annual economic impact of project operations would equal roughly 73 jobs (direct, indirect, and induced) and $7.4 million in labor income (direct, indirect, and induced).

[12] One job-year is the equivalent of one full-time job held for a period of one year. For example, this could equal one full-time job held for 12 months, two full-time jobs held for six months, three full-time jobs held for four months, or two half-time jobs held for one-year, and so on.

Socioeconomics Table 12
HBEP Economic Benefits (2012 dollars)

Total Fiscal Benefits	
Estimated annual property taxes	$5.41 million to $5.96 million
State and local sales taxes:	
Construction	$3.5 million
Operation	$244,668
School Impact Fees	$8,554 est. total HBCSD and HBUHSD combined
Total Non-Fiscal Benefits	
Total capital costs	$500 million to $550 million
Construction payroll (incl. benefits)	$241.1 million
Operations payroll (incl. benefits)	$4.35 million
Construction materials and supplies	$61.15 million
Operations and maintenance supplies	$4.45 million
Total Direct, Indirect, and Induced Benefits	
Estimated Direct Benefits	
Construction Jobs	192 (average)
Operation Jobs	33
Estimated Indirect Benefits	
Construction Jobs	24
Construction Income	$1.2 million
Operation Jobs	7
Operation Income	$1.3 million
Estimated Induced Benefits	
Construction Jobs	163
Construction Income	$8.4 million
Operation Jobs	33
Operation Income	$1.7 million
Summary of Local Benefits (to Orange County)[1]	
Estimated Direct Benefits	
Construction payroll (incl. benefits) (90 percent to Orange County)	$217.3 million
Operations payroll (incl. benefits) (74 percent to Orange County)	$4.34 million
Construction materials & supplies (100 percent to Orange County)	$45.02 million
Operations & maintenance supplies (100 percent to Orange County)	4.45 million

Note: [1] Based on applicant's estimates. **Source:** HBEP 2012a.

PROPERTY TAX

The Board of Equalization (BOE) 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. The HBEP would be a 939 MW power generating facility, therefore, BOE is responsible for assessing property value. The property tax rate is set by the Orange County Auditor-Controller's office.

Assuming a capital cost of $500 to 550 million and a property tax rate consistent with the current rate for the existing Huntington Beach Generation Station property (1.08299 percent), the project would generate approximately $5.41 to 5.96 million in property tax revenues during the first operation year of the project (HBEP 2012a, pg. 5.10-14). The estimated revenue includes the assessment of the HBEP only, which would replace the existing assessed Units 1 through 5 upon demolition. The increase in property taxes resulting from the HBEP project would be about eight to nine percent of Huntington Beach's property tax revenues for FY 2011-12 (HB City 2011, pg. 443).

RESPONSE TO AGENCY AND PUBLIC COMMENTS

Energy Commission staff contacted the Huntington Beach Police Department (Lieutenant Thomas Donnelly) to discuss the proposed project, ascertain the department's ability to provide law enforcement services to the project, and solicit comments or concerns the department might have about the project. Lieutenant Donnelly's comments are 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 and Jim Adams' comments are addressed in this analysis.

Staff received comments from the applicant in response to the Socioeconomics section of the HBEP PSA- Part A. The applicant's comments were discussed during the PSA workshop for Part A and were summarized and resolved in the Socioeconomics section of the PSA- Part A Supplemental Focused Analysis. There were no other Socioeconomic- related comments on the PSA-Part A or on the PSA- Part A Supplemental Focused Analysis.

PROPOSED FINDINGS OF FACT

Staff concludes the HBEP would not cause a significant adverse direct, indirect, or cumulative socioeconomic impact as result of the construction or operation of the proposed project, 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 adverse 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 substantial adverse 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:
    - o law enforcement service
    - o education
    - o parks

4. The project would not increase the use of existing neighborhood and regional parks or recreational facilities to the extent that substantial physical deterioration of the facility would occur or be accelerated and new parks are not proposed by or needed because of the project.

5. The project's impacts would not result in any significant adverse cumulative impacts on population, housing, schools, parks and recreation, or law enforcement. There is a more than a sufficient workforce available for the HBEP project plus other future planned projects. Therefore, staff does not expect the construction or operation of the HBEP to contribute to any significant adverse cumulative socioeconomic impacts.

PROPOSED CONDITIONS OF CERTIFICATION

SOCIO-1 The project owner shall pay the one-time statutory school facility development fees to the Huntington Beach Union High 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 Compliance Project Manager (CPM) proof of payment to the Huntington Beach Union High School District of the statutory development fee.

SOCIO-2 The project owner shall pay the following one-time Development Impact Fees to the city of Huntington Beach as required by Chapter 17 of the Huntington Beach municipal code:

- Police Facilities Development Impact Fees
- Parkland Acquisition and Park Facilities Development Impact Fees

Verification: At least 90 days prior to the start of commercial operation, the project owner shall confer with the CEC's assigned Chief Building Official (CBO) for HBEP to calculate the applicable one-time development impact fee(s) as set forth in Chapter 17 of the Huntington Beach Municipal Code. At least 30 days prior to commercial operation, the project owner shall provide to the Compliance Project Manager (CPM) proof of payment to the city of Huntington Beach of the required Development Impact Fee(s).

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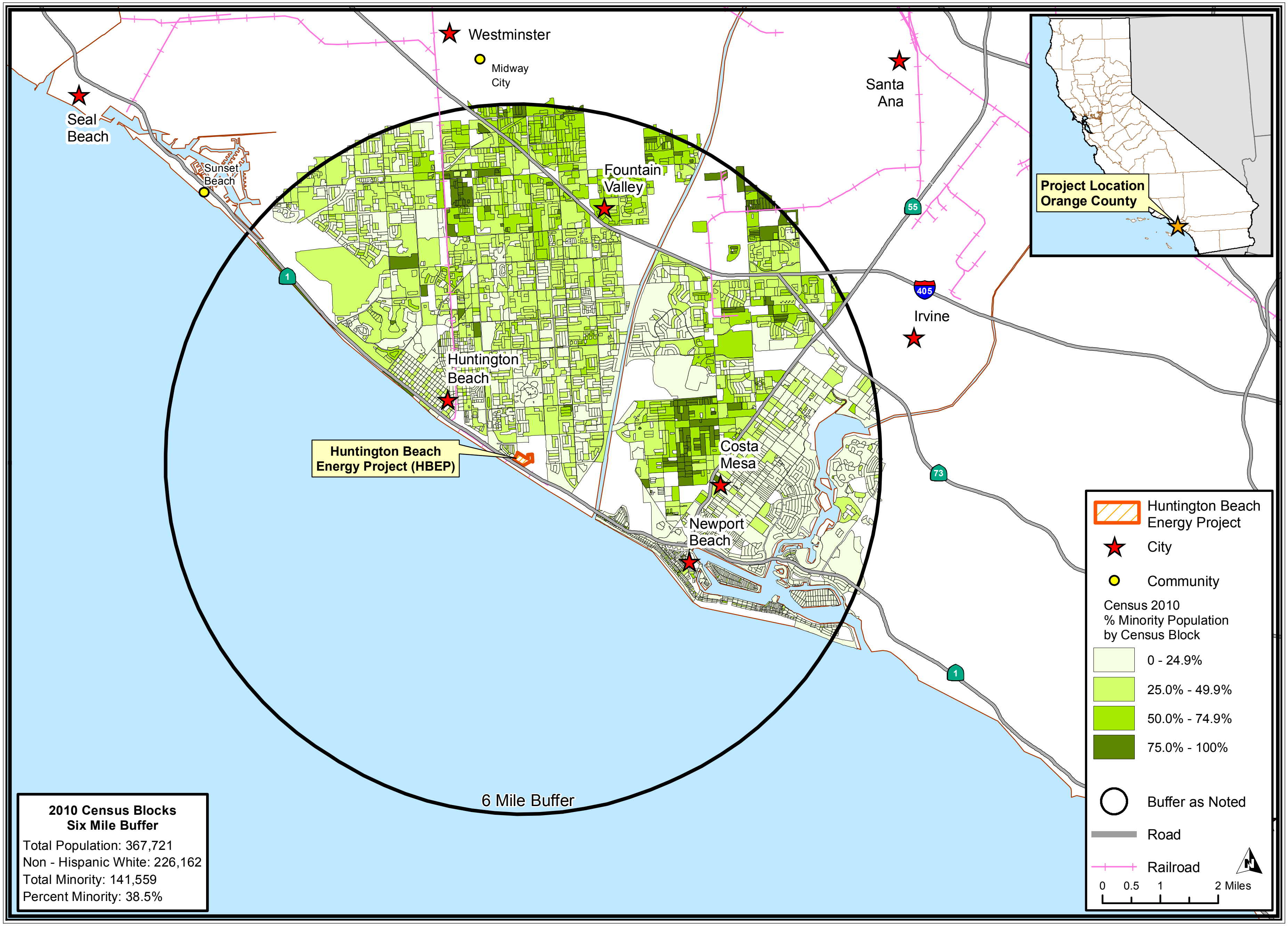
SOCIOECONOMICS - FIGURE 1

Huntington Beach Energy Project - Census 2010 Minority Population by Census Block - Six Mile Buffer



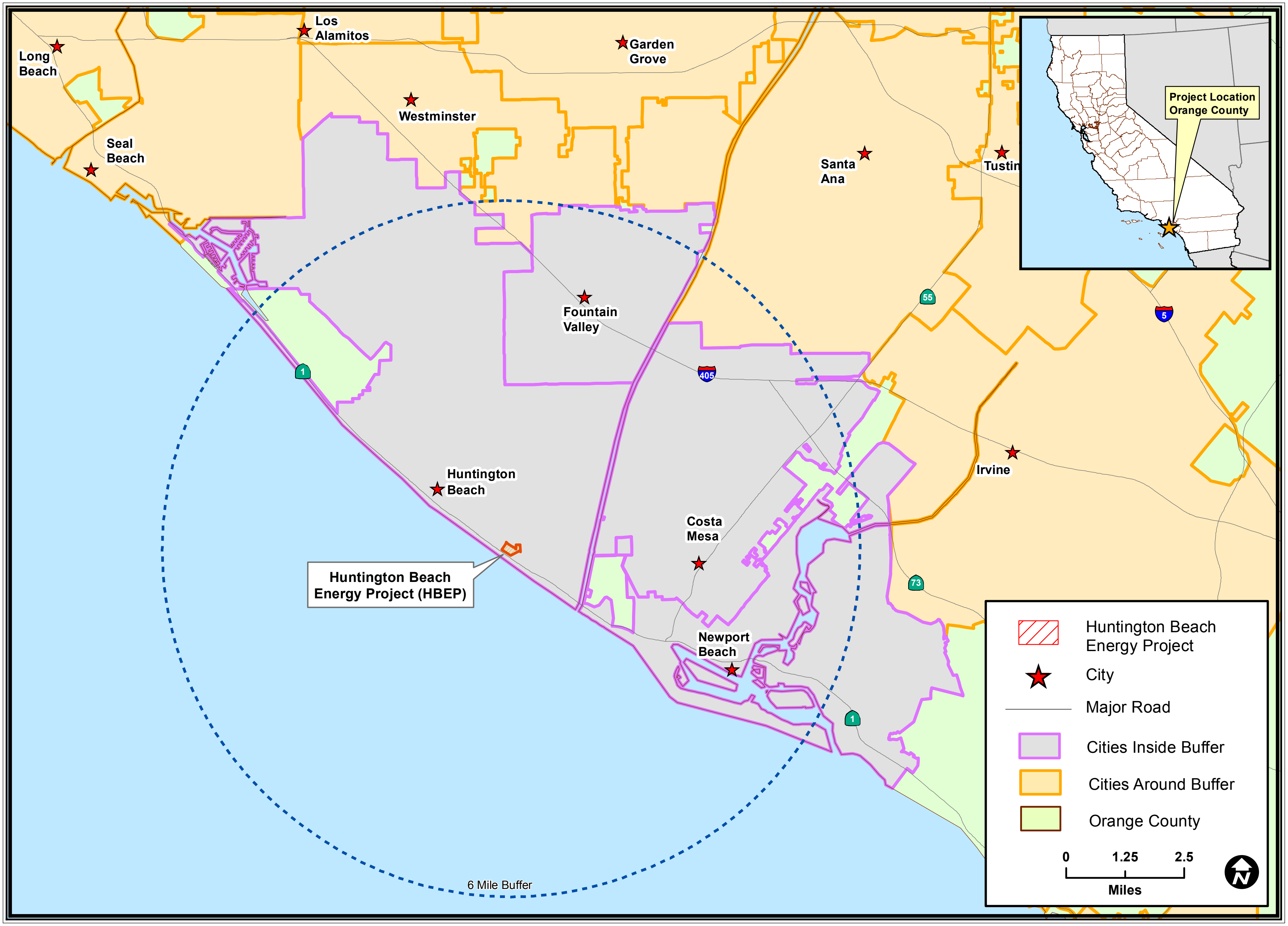
SOCIOECONOMICS

CALIFORNIA ENERGY COMMISSION, SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCE: Multinet, Census 2010 - PL94-171, Open Street Map City Data March 2013.

SOCIOECONOMICS - Figure 2

Huntington Beach Energy Project - Cities In and Around the Six Mile Buffer



SOCIOECONOMICS

CALIFORNIA ENERGY COMMISSION, SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCE: Census 2010 - PL94-171, OpenStreetMap March 2013.

SOIL AND WATER RESOURCES

Testimony of Mike Conway, P.G.

SUMMARY OF CONCLUSIONS

Based on the assessment of the proposed Huntington Beach Energy Project (HBEP), California Energy Commission (Energy Commission) staff concludes that:

- The proposed project would use potable water. However, it reduces the amount of water used relative to baseline conditions (Huntington Beach Generating Station). The reduction in water use would be about 175 acre feet per year (AFY), which would result in additional supplies for other beneficial uses.
- Although the project would reduce potable water use relative to baseline conditions, staff conducted additional analysis to evaluate whether secondary effluent from a nearby wastewater treatment plant could be used as an alternative supply. Staff investigated a number of potential routes and ways to reduce costs to deliver secondary effluent to the project site, but none were found to be economically or technically feasible.
- The proposed project would result in a 0.16 million gallon per day (mgd) reduction in industrial waste water volume to the Pacific Ocean and a similarly proportional decrease in pollutant loading.
- The proposed project would result in the elimination of once through cooling from the existing Huntington Beach Generating Station. Once-through cooling water from the Pacific Ocean would be replaced by city of Huntington Beach municipal supply water.
- 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 **SOIL&WATER-1** would adequately minimize soil loss.
- Staff proposes Condition of Certification **SOIL&WATER-1,** which would require the proposed project to comply with the Clean Water Act and obtain discharge permits for construction through the State Water Resources Control Board. This condition would ensure that the impacts to waters of the United States from construction would be less than significant.
- Staff proposes Condition of Certification **SOIL&WATER-2**, which would require the proposed project to comply with Permit Order No. R8-2009-0003, NPDES NO. CAG998001, 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.

- Groundwater at the site is relatively shallow and potentially contaminated by petroleum products. Trench and foundation excavations would likely encounter shallow groundwater and dewatering would be required for stabilization. If the applicant engages in dewatering, staff would recommend that the applicant comply with Condition of Certification **SOIL&WATER-3**, which would require the applicant to apply for coverage under a permit that would allow for the discharge of petroleum-contaminated water.
- Staff proposes Condition of Certification **SOIL&WATER-4,** which would require the proposed project to comply with the Clean Water Act and obtain discharge permits for operation through the State Water Resources Control Board. This condition would ensure that the impacts to waters of the United States from dewatering discharge would be less than significant.
- Staff proposes Condition of Certification **SOIL&WATER-5**, which would require the proposed project to comply with the city of Huntington Beach code, Title 14 Water and Sewers. This condition would ensure that connections to the city's water and sewer system are completed appropriately and that annual fees are paid to the city.
- Staff proposes Condition of Certification **SOIL&WATER-6**, which would limit the proposed project's water use to 115 acre-feet per year and require regular water use reporting to the Commission.
- Staff proposes Condition of Certification **SOIL&WATER-7**, which would require the applicant to install water meters.
- The proposed project is located in Zone X and protected from the one-percent annual chance of flooding (100-year flood) by an accredited levee along the Huntington Beach Channel.
- Recent Energy Commission studies show the Huntington Beach vicinity is at increased risk of flooding due to relative sea level rise. However the proposed site would be sufficiently above sea level to ensure power plant reliability. Even with high-end estimates of relative sea-level rise of 61 centimeters (2.0 feet) by 2050 (relative to 2000) (NAS, 2012), the site would still be about 2.0 feet above the current (2012) 100-year floodplain (FEMA, 2012).
- 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. Development of alternative water supplies for remaining industrial uses does not appear to be feasible. In addition, the project would use a number of systems to reuse wastewater and reduce wastewater volume. Staff believes the project water use is consistent with Energy Commission water policy.
- The proposed project helps the entire Huntington Beach Power Station move away from once-through-cooling (OTC). 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.

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 HBEP. This assessment incorporates information gathered by the Energy Commission staff and focuses on the potential for HBEP 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 HBEP 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 HBEP with respect to the use and management groundwater resources.

Soil & Water Table 1
Laws, Ordinances, Regulations, and Standards (LORS)

Applicable 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.
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.
California Water Code Sections 10910-10915	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 for the Santa Ana River Basin (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 provide 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 to 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 R8-2010-0062, NPDES No. CA0001163	This SWRCB permit regulates all operational water discharges from the Huntington Beach Energy Project site, including once-through cooling water, storm water, and industrial process water.
Santa Ana Regional Water Quality Control Board, Permit Order No. R8-2009-0003, NPDES NO. CAG998001	The Santa Ana Regional Water Quality Control Board issued this order to regulate discharges to surface waters that pose a *de minimus* threat.
Santa Ana Regional Water Quality Control Board, Permit Order No. R8-2007-0008, NPDES No. CAG918001	This order provides NPDES coverage for discharges of petroleum contaminated water in the Santa Ana region.
Local LORS	
City of Huntington Beach – Code Chapter 14.36 - Sewer System Service Connections, Fees, Charges, and Deposits	Defines local fees for sewer 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."
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 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. The proposed project helps achieve the goals of the OTC Plan through dry-cooling and reduced discharge.

PROJECT DESCRIPTION

The HBEP would be located in northwestern Orange County, California. The site is adjacent to Huntington Beach State Park and is approximately 900 feet inland from the Pacific Ocean. See **Soil & Water Figure 1** for a site location map.

The HBEP is a proposed natural gas-fired, combined-cycle, air-cooled, 939-megawatt (MW) electrical generating facility that would replace the AES Huntington Beach Generating Station (HBGS). HBEP would consist of two independently operating, three-on-one, and combined-cycle gas turbine power blocks. Each power block would consist of three-gas-fired combustion turbine generators (CTG), three supplemental fired heat recovery steam generators (HRSG), one steam turbine generator (STG), an air-cooled condenser, and related ancillary equipment. Other equipment and facilities to be constructed and shared by both power blocks would include natural gas compressors, water treatment facilities, emergency services, and administration and maintenance buildings.

Construction would commence with the removal of the existing Huntington Beach Generating Station unit 5 and onsite fuel tanks. Unit 5 demolition is scheduled to begin the 1st quarter of 2015; its removal would clear necessary space to construct the new Block 1, which is expected to take approximately 30 months. Demo of HBGS Units 3 and 4 would take place during the 1st quarter of 2016, with construction taking approximately 27 months. Block 1 construction would begin between mid 2016 and mid 2018 and Block 2 construction would begin between mid 2018 and mid 2020. HBGS Units 1 and 2 demolition would begin between late 2020 and late 2022 (TN 69961) after Blocks 1 and 2 would be built and be operational.

Construction would disturb about 26 acres between on- and off-site construction and staging areas. Construction laydown would require 22 acres, split between the Huntington site (on-site 6 acres) and the Alamitos Generating Station (off-site 16 acres).

Water Supply

The city of Huntington Beach would provide the proposed project both its process and domestic water through an existing 8-inch pipeline that supplies the existing Huntington Beach Generating Station. The city has already provided the applicant a will-serve letter indicating that service is available. The proposed project would use about 115 AFY, assuming 6,665 hours of operation (HBEP 2012a). The expected range in water use rates would be between 94 and 190 gallons per minute (gpm). Water from the city would be fed into a 442,500-gallon service water/fire tank. This tank would therefore be capable of providing up to 78 hours of operational water under average use conditions of 94 gpm (HBEP 2012a).

Construction would require potable water for dust suppression. Average water use during construction would be about 18,000 gallons per day (gpd) and around 24,000 gpd during hydrostatic testing and commissioning. Commissioning is expected to take about 60 days. Average annual water use for construction is not expected to exceed 22 AFY.

The proposed HBEP would employ 33 full-time employees. The expected water use for domestic purposes would be about 1 gpm, or about 1.2 AFY (HBEP 2012a).

The city’s water supply source is part groundwater (62 percent) and part imported surface water (38 percent). Groundwater is provided to the city by 10 groundwater wells operated by the Orange County Water District. The Metropolitan Water District provides Huntington Beach with surface water supplies sourced from the Colorado River and the State Water Project (Huntington, 2013).

Process Waste Water

The project would collect wash-down, general facility, and equipment floor drains and sumps and route them to an oil/water separator system. Wastewater streams that are unlikely to contain oil and grease, such as the cooler blowdown units and reverse osmosis reject, would bypass the oil/water separator. These process wastewaters would be discharged to the existing Huntington Beach Generating System outfall, directly to the Pacific Ocean. Discharge rates would range between 29 and 160 gpm, with average annual discharge equaling about 11.6 million gallons per year (HBEP 2012a).

Sanitary Waste Water

Sanitary wastewater would be discharged to the city’s sanitary sewer system and treated by Orange County Sanitation District Facilities. A discharge of approximately 0.16 gpm is expected from the proposed project during all operating conditions. The city of Huntington Beach provided the applicant with a will-serve letter, indicating the availability of this service.

Stormwater

The proposed project would use the existing site stormwater drainage system. Stormwater in contact with industrial equipment is routed through the oil/water separator system where it would comingle with process discharge water before discharging to the Pacific Ocean. Non-contact stormwater would discharge to one of two onsite retention basins.

SETTING

Groundwater

The proposed project site is in the Peninsular Ranges Physiographic Province along the California coastline, south of the Los Angeles and Orange county line. This province consists of northwest-trending synclinal trough that contains a thick sequence of water bearing marine and continental sediments (Edwards et al., 2009). The southeast most portion of this coastal aquifer system begins at the Orange county line and ends at the San Joaquin Hills in the south and the Santa Ana Mountains in the East. This portion of the coastal aquifer system is identified as the Coastal Plain of Orange County Groundwater Basin (hereafter referred to as Basin), which encompasses a 350 square mile area (DWR, 2004). The Basin underlies the lower Santa Ana River watershed (OWP, 2012).

Depth to water at the site ranges from 5 to 12 feet below land surface. The groundwater gradient beneath the site is toward the northwest at about 0.002 foot per foot. The reported seepage velocity is about one foot per day (Jamison and Associates, 2012).

Surface Water

Surface watersheds in California are divided into management areas by the state's Regional Water Boards based on political and physiographic boundaries. The HBEP would be within the area regulated by the Santa Ana Regional Water Quality Control Board (RWQCB). The proposed site is located within the Lower Santa Ana River hydrologic area and is part of the East Coastal Plain hydrologic sub-area. The greater Santa Ana watershed that encompasses these hydrologic areas is bounded by consolidated rocks exposed on the north in the Puente and Chino Hills, on the east in the Santa Ana Mountains, and on the south in the San Joaquin Hills. This hydrologic basin is bounded by the Pacific Ocean on the southwest and by a low topographic divide approximated by the Orange County - Los Angeles County line on the northwest. The East Coastal Plain hydrologic sub-area covers approximately 304 square miles and receives approximately 12.7 inches of rain annually (OWP, 2012).

The Magnolia Marsh wetland preserve is along the southeastern border of the site. Other nearby wetland preserves includes the Brookhurst Marsh, Talbert Marsh, and Newland Marsh. The Huntington Beach Channel runs along the northeastern boundary of the HBEP site and the Talbert Channel is located approximately 0.5 mile to the east of the site. The Santa Ana River runs north to south approximately 1.25 miles to the east of the project site. The Santa Ana River's headwaters are located in the San Bernardino Mountains and the river travels through Orange County and portions of Riverside, San Bernardino, and Los Angeles counties before reaching its confluence with the Pacific Ocean (HBEP 2012a).

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 HBEP. 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, staff evaluates the applicant's proposed mitigation for sufficiency and may or may not recommend additional or entirely different mitigation measures that are potentially more effective than those proposed by the applicant. Mitigation is designed to reduce the effects of potentially significant HBEP 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 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 HBEP impacts.

Water Resources

Staff evaluated the potential of HBEP 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 California Environmental Quality Act (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 applicant 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 HBEP construction and operations 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 applicant's proposed mitigation and a discussion of the adequacy of the proposed mitigation. In the absence of applicant-proposed mitigation or if mitigation proposed by the applicant is inadequate, staff mitigation measures are recommended.

Water Quality

Construction Storm Water Discharges

Approximately 25.63 acres of land would be disturbed during construction of the proposed project. HBEP construction would require both onsite and offsite laydown and construction parking areas. No new offsite linears are proposed for the project. Approximately 22 acres of construction laydown would be required, with approximately 6 acres at the Huntington Beach Generating Station used for a combination of laydown and construction parking, and 16 acres at the Alamitos Generating Station used for construction laydown.

If not managed properly, operations or construction activities at the HBEP would have the potential to contaminate storm water runoff and thereby impact local surface waters, specifically the Pacific Ocean. Ocean waters in the vicinity are protected from degradation by the Santa Ana Basin Plan.

The discharge for the site would be subject to regulation by the RWQCB based on Beneficial Uses identified in the Santa Ana Basin Plan as the Offshore Zone, "Waters Between Nearshore Zone and Limit of State Waters." The site is subject to regulation under the Santa Ana Basin Plan as the Nearshore Zone identified as "San Gabriel River to Poppy Street in Corona Del Mar." These categories of regulations help define the resources in need of protection in a specific drainage area. The RWQCB regulations protect the following beneficial uses in the site vicinity:

- Industrial Service Supply (IND)
- Navigation (NAV)
- Water Contact Recreation (REC1)
- Non-Contact Water Recreation (REC1)

- Commercial and Sportfishing (COMM)
- Wildlife Habitat (WILD)
- Rare, Threatened, or Endangered Species (RARE)
- Spawning, Reproduction, and Development (SPWN)
- Marine Habitat (MAR)

During construction and operation, 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 Huntington Beach Generating Station process drain system, which consists of oil/water separation sumps and two retention basins. Stormwater that falls within the plant-wide pavement areas and outside the process equipment containment areas would be routed to the retention basin. A small portion of stormwater may fall outside of the process containment and pavement areas and would either percolate directly into the soil or drain over the surface into the retention basins to assist with the removal of suspended solids. The oil-free stormwater from the process areas and from the pavement areas collected in the retention basins would be discharged to the Pacific Ocean via an existing outfall. The residual oil containing sludge would be collected via vacuum truck and disposed of as hazardous waste. See the **WASTE MANAGEMENT** section for details about disposal locations and quantities.

The project owner would discharge storm water to the same outfall currently utilized by the Huntington Beach Generating Station under the requirements of the Order No. R8-2010-0062, NPDES No. CA0001163.The storm water discharge would join the waste discharge pipeline that extends 1,500 feet into the ocean. The owner would be required to obtain a construction storm water permit during construction and would be covered by project-specific Waste Discharge Requirements issued by the RWQCB for industrial storm water discharges that occur during operation.

The estimated amount of soil disturbance resulting from HBEP construction activities requires that it be covered under the federal General Construction Permit (SWRCB Order No. 2009-0009-DWQ). To ensure compliance with this order, the project should be required to comply with Condition of Certification **SOIL&WATER-1** which requires a construction Storm Water Pollution Prevention Plan (SWPPP) for the HBEP site and laydown areas. The SWPPP would specify BMPs that would prevent all construction 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 applicant would 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, an additional permit may be required by the RWQCB. Permit Order No. R8-2009-0003, NPDES NO. CAG998001 allows for the discharge of water that poses a *de minimus* threat to surface water quality. If necessary, the applicant shall comply with **SOIL&WATER-2**, which would require the applicant to obtain permit coverage for hydrostatic discharges under Permit Order No. R8-2009-0003, NPDES NO. CAG998001.

Contaminated Groundwater

The Phase I ESA states that "Groundwater underlying the site is known to be impacted by metals, VOCs and 1,4-dioxane. Groundwater is monitored as part of on-going subsurface investigations regarding former Southern California Edison operations at the site including former operation of waste-water retention basins (HBEP 2012a, Phase I ESA). These investigations are currently overseen by the Department of Toxic Substances Control. The presence of groundwater contamination represents a *Recognized Environmental Condition* in connection with the site."

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 applicant did not provide a discussion of how contaminated groundwater would be discharged, what volumes may be expected, and how hazardous it could be to the environment. If groundwater dewatering is necessary, the project owner shall apply for coverage for discharges of petroleum contaminated water in the Santa Ana region. Under Order No. R8-2007-0008, NPDES No. CAG918001. Coverage under Order No. R8-2007-0008, NPDES No. CAG918001 may not be necessary if water quality tests reveal that local groundwater contamination does not exist. Staff proposes Condition of Certification **SOIL&WATER-3**, which would require the applicant to apply for coverage for the discharge of petroleum contaminated water if the applicant engages in groundwater dewatering at the proposed site.

Industrial Wastewater and Storm Water Discharge

As stated above, during operation, the existing storm water collection system would be used to collect and process stormwater from the site. The oil-free stormwater from the process areas and from the pavement areas collected in the retention basins would be discharged to the Pacific Ocean via an existing outfall. The residual oil containing sludge would be collected via vacuum truck and disposed of as hazardous waste (HBEP 2012a). See the **WASTE MANAGEMENT** section of this analysis for more details about waste streams.

The proposed HBEP would discharge its industrial waste water to the Pacific Ocean through the same outfall currently utilized by the Huntington Beach Generating Station under the requirements of the Order No. R8-2010-0062, NPDES No. CA0001163. The discharge rate could range from 29 to 161 gpm. The average annual discharge is expected to be about 11.6 million gallons or about 36 AFY, assuming 6,665 hours of annual operation.

The existing Huntington Beach Generating System discharges approximately 98 billion gallons per year (300,750 AFY) to the Pacific Ocean through once-through cooling units. Therefore the new project would allow for a 300,714 AFY reduction in discharge to the Pacific Ocean. This is a measureable reduction in pollutant loads sent to the ocean from the site.

The proposed project is expected to be issued a new NPDES permit for operations discharge that would replace the existing Order No. R8-2010-0062, NPDES No. CA0001163. The new permit would require the implementation of Best Management Practices (BMPs) for both the project's industrial discharge and the project's operational storm water discharges to the Pacific Ocean. BMPs would likely include pollutant source control, pollutant containment, a monitoring and sampling protocol, and an iterative process for improving initially implemented BMPs based on monitoring and sampling results.

The applicant submitted a draft version of the Waste Discharge Permit application that would be filed with the RWQCB following Energy Commission approval of the project and before the first quarter of 2015 when construction would begin. The applicant also submitted documentation of correspondence with the RWQCB indicating that the applicant's schedule is reasonable (HBEP 2012a, AFC, Appendix 5.15D).

With implementation of BMPs and associated monitoring activities included in Board-issued WDRs, impacts to water quality from operation of the proposed HBEP would be less than significant. Staff proposes **SOIL&WATER-4** which would require the applicant to obtain a permit for project operation from the RWQCB, prior to beginning construction.

Sanitary Wastewater

The city of Huntington Beach provided the applicant a will-serve letter dated April 3, 2012, indicating its intent to provide the site sewerage service. If the proposed HBEP discharges sanitary waste as described above, the impact from its disposal should be less than significant. Staff proposes **SOIL&WATER-5** which would require the applicant to pay sanitary sewer fees ordinarily assessed by the city, in accordance with the city of Huntington Beach Municipal Code Chapter 14.54.

Water Supply

Industrial

HBEP would use about 115 AFY of potable water provided by the city of Huntington Beach for industrial process water. Process water would be used for the generator turbine wash, evaporative cooling blowdown makeup, water treatment, and other purposes. The project would access this water through an existing 8-inch-diameter city of Huntington Beach potable water line serving the existing Huntington Beach Generating Station. The city of Huntington Beach will-serve letter (HBEP 2012a, Appendix 5.15A) indicates there is sufficient supply of potable water to accommodate the HBEP. The potable water that would be provided to the HBEP for use as process water and domestic water is currently allocated for industrial use at the existing Huntington Beach Generating Station (HBEP 2012a).

Based on water volumes from 2004 through 2011, the existing Huntington Beach Generating Station has historically used approximately 290 AFY while operating at only 15 percent of its maximum capacity. The existing Huntington Beach Generating Station therefore uses more portable water than is proposed for the HBEP, which would result in a net reduction of potable water use equal to 175 AFY and a net beneficial impact on local water supplies, despite a large increase in capacity factor and energy production (megawatt-hours).

Staff prepared an estimate of the potential maximum annual water use by the new facility and presented it in the Supplemental Focused Analysis (TN: 201471, 12/23/2013) because the applicant did not provide an estimate for analysis. In the applicant's response (HBEP 2014xx, TN: 201582, 1/21/2014), they indicated that 134 AFY would be an appropriate maximum annual water use estimate. Staff believes the applicant's estimate is reasonable and updated **SOIL&WATER-6** to require that the project's maximum annual use not exceed 134 AFY.

Construction

Construction would require potable water for dust suppression. Average water use during construction would be about 18,000 gallons per day (gpd) and around 24,000 gpd during hydrostatic testing and commissioning. Commissioning is expected to take about 60 days. Average annual construction water use is not expected to exceed 22 AFY.

The volume of water required for construction would be offset by the operational water savings during the life of the project. The water necessary for construction would allow the proposed project to proceed and result in a net reduction in local water use.

Domestic

The HBEP would employ a staff of 33 in three rotating shifts. 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. Average use is expected to be less than 1 gpm, or about 1.2 AFY.

Staff proposes **SOIL&WATER-5** which would require the applicant to pay for water supply connection fees ordinarily assessed in accordance with the Huntington Beach Municipal Code Chapter 14.54.

To ensure that project water use is within the projected volumes analyzed herein, staff proposes Conditions of Certification **SOIL&WATER-6** and **-7**, which would require the applicant to report facility water use in compliance reports. If **SOIL&WATER-6** and **-7** are implemented as proposed, impacts to local water supplies would be less than significant.

Water Supply Alternatives

Responses to staff data requests suggested that secondary effluent could be reasonably delivered to the site from Orange County Sanitation District (OCSD) (HBEP 2013ii). Through further investigation staff learned that no economically and technically reasonable means currently exists to construct conveyances, deliver, and treat secondary effluent for use at the HBEP site.

Staff considered two possible secondary effluent pipeline routes for delivery to the site. The first option would require a new connection to an OCSD interplant pipeline that delivers secondary effluent from Plant #1 in the north to Plant #2 in the south, along with about 2 miles of new pipeline along Hamilton Avenue. The second option would require conveyance of secondary effluent from Plant #2 along the Pacific Coast Highway (Highway 1), about 1.5 miles.

The first option was determined to be infeasible following discussions with the city of Huntington Beach. This option would require a pipeline installation along Hamilton Avenue where limited-to-no space is available for additional underground utilities. The city stated that the future Poseidon Desalination Plant, if permitted, would have the right to use the remaining utility space. Though the future of the Poseidon facility is uncertain at this time, it would be risky to assume that utility space would be available along Hamilton Avenue. This route for secondary effluent conveyance is considered infeasible at this time.

The second option was also evaluated by staff and the applicant. Staff had a conference call with Caltrans on April 21, 2014, in which Caltrans informed staff that they could not comment on the feasibility of placing a pipeline along Highway 1. Prior to determining whether this route is potentially feasible, Caltrans must receive a formal application and request to evaluate the feasibility of installing a pipeline. The applicant prepared a cost estimate of the same route titled “PCH Alignment,” and concluded the cost of installing the pipeline and necessary treatment facilities would be $21.8 million and would require $1.7 million annually for maintenance. The annual (present-day) cost of potable water is estimated at $116,000, not including onsite treatment. This route for secondary effluent conveyance is considered infeasible at this time.

Staff also spoke with the Orange County Water District (District) about the availability of tertiary treated water for use at the HBEP. The District indicated that all available tertiary treated water is in use for the Green Acres Project or for underground injection to prevent salt water intrusion. Besides the nearest connection to tertiary water being over five miles from the HBEP, tertiary water is not available for the project. If the District expands its treatment program in the future, additional water would be injected to further prevent salt water intrusion and indirectly provide for municipal uses. Water injected by the District ultimately adds to the same aquifers being used for municipal supply. In this way, water removed from the injection program may indirectly reduce the local municipal supply. This reduces the incentive of using this tertiary treated water at HBEP.

Staff always investigates the economical and environmental feasibility of power plants using the least amount of the lowest quality of water. Staff was not able to find a preferable alternative water supply for the HBEP. As discussed above, the use of potable water in the proposed replacement project substantially reduces the site's impact on the local water supply, which is a substantial benefit.

Flooding

Staff reviewed the Federal Emergency Management Agency (FEMA) Huntington Beach (06059C0263J) Flood Insurance Rate Map (FIRM). The proposed project is located in Zone X and protected from the 1 percent annual chance of flooding (100-year flood) by an accredited levee along the Huntington Beach Channel (FEMA, 2012). Accredited levee designations are issued by FEMA for use on Flood Insurance Rate Maps (FIRM). An accredited levee can be designated by FEMA if the owner of the levee passes a certification process and provides an adequate operations and maintenance program.

The Orange County Flood Control Maintenance Office (Maintenance Office) is responsible for the upkeep of the local levees that provide the necessary flood protection. Staff contacted the Maintenance Office (TN # 69272) in an attempt to understand active maintenance on the Huntington Channel. Following the meeting, staff understands that the recent FEMA maps incorporate current site and levee elevations. The proposed project site would not need to be raised to maintain Zone X status. Orange County is not aware of any other site improvements done to modify its flood control functions. See **Soil & Water Figure 2** for a detail of the local flood zones.

Flood hazard maps were recently revised for the county in December 2009, 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 and it should be noted that potential relative rise in sea-level would require augmentation of the Huntington Channel to maintain the current level of protection.

Projected sea-level rise has the potential to reduce the effectiveness of local flood control measures by increasing the base level (sea-level) of the Huntington Beach Channel. 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). The site geotechnical report (Ninyo & Moore, 2011) acknowledges future sea-level rise. An Energy Commission study (CEC, 2009) also shows the project site may have reduced flood protection and inundation potential in the future. A significant rise in local sea water levels would also raise groundwater levels, decrease relative flood protection currently afforded by levees along the Huntington Beach Channel, and raise the fluvial base level, thereby potentially increasing the rate and extent of flooding.

The proposed project would have final grades between 12 to 16 feet above sea level. The Huntington Beach Channel and surrounding communities are at about eight feet above sea-level. These elevations suggest that the site has four to eight feet of elevation separation from the surrounding area. The current projections of sea-level rise could reduce the separation between the site and the flood channel elevation by up to 2.0 feet by 2050. However, if the minimum separation between the site and the surrounding floodplain is reduced from four feet to two foot there would still be a 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.

Storm surge is taken into account when FEMA conducts coastal zone flood analyses. The Base Flood Elevations (BFEs) are the sum of storm surge, wave run-up, and tidal effects. The FEMA FIRM for Huntington Beach shows that the coastal zone immediately adjacent to the proposed project is classified, Zone VE, 14-feet. Though this base flood elevation is as high as the Huntington Beach site, it does not have enough lateral reach to get to the project site. The site is also higher than the surrounding areas which would provide additional buffering capacity against coastal inundation.

Tsunami and Seiche

The proposed site is within the zone identified by California Emergency Management Agency (CEMA) as a tsunami inundation zone (**Soil & Water Figure 3**). The proposed site is within a six square-mile area that could be impacted by a tsunami. However, the site is above the expected inundation elevation and therefore tsunami events are not expected to be a threat, as described in the **GEOLOGY & PALEONTOLOGY** section. 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 would result in a net reduction of 175 AFY. When considered cumulatively this 175 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 HBEP would result in a net cumulative benefit in waste discharges to the Pacific Ocean. Industrial discharge flows would decrease because of decreased plant water use. Permitted average discharge flows are 0.2 mgd for HBGS, whereas the HBEP discharges would average 0.04 mgd, which would be a 0.16 mgd reduction in water volume and a similarly proportional decrease in pollutant loading. When considered cumulatively this 0.16 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. The proposed project would also allow for the elimination of the existing once-through cooling discharge, permitted at 507 mgd, and a decrease in the ultimate discharge temperature to the ocean. Both of these factors would benefit water quality.

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 HBEP 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 HBEP would satisfy the requirements of the National Pollutant Discharge Elimination System (NPDES) permit with the adoption of Conditions of Certification **SOIL&WATER-1** and **SOIL&WATER-2**. These conditions would ensure that the appropriate NPDES permits are obtained by the applicant.

PORTER-COLOGNE WATER QUALITY CONTROL ACT

Staff has concluded that HBEP 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.

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."

Alternative sources were evaluated for their potential to supply the project's process water needs. Two nearby wastewater treatment plants were considered in the applicant's analysis for their potential to supply recycled water to HBEP. Staff agrees that these alternatives are not superior because the project's proposed water supply would significantly reduce water use at the existing facility and be a net benefit relative to the baseline. Other alternatives would require substantial construction in densely populated urban areas.

Additionally, HBEP proposes to use an alternative 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 175 AFY compared to the baseline. Staff concurs with the applicant that the use of an air cooled condenser is an economically sound practice that provides environmental benefits from significantly reduced water use. Staff also notes that although the project would include limited freshwater use for inlet air cooling, it would also include use of dry low NOx combustors which would limit 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 HBEP would not utilize ZLD technologies, because the project would allow for a substantial reduction (0.16 mgd) in wastewater volume to the Pacific Ocean. Staff notes that the applicant proposes a number of water reuse and wastewater reduction systems which would include the following:

- The reject water stream from the reverse osmosis system would be discharged to a holding tank for reuse onsite such as equipment wash down, fire water loop, and closed-loop cooling.
- Blowdown (condensate removed from the HRSGs to reduce water contaminants) would be discharged to an atmospheric flash tank, where the flash steam would be vented to the atmosphere and the condensate would be cooled prior to transfer to a holding tank for reuse.
- Blowdown from the combustion turbine evaporative coolers would be discharged to the plant process drain system and stored for reuse onsite.
- Service water would be used for makeup to the combustion turbine evaporative coolers, equipment washdown, and other miscellaneous plant uses.

Therefore, staff finds that the wastewater management would be in compliance with the intent of the water policy because it eliminates the significant portion of process wastewater discharge from the facility.

WATER SUPPLY ASSESSMENT

California Water Code, Sections 10910-10915

Staff reviewed California Water Code, Sections 10910-10915 to evaluate their applicability to the proposed project. The codes require public water systems to prepare water supply assessments (WSA) for certain defined development projects subject to the California Environmental Quality Act.

Staff determined that a WSA does not need to be prepared for the proposed project. The proposed project does not meet the definition or the intent of the code requiring a WSA. Prior to conducting a WSA, the preparer must determine whether the project meets the definition of "project" as described by the code.

According to Section 10912, a "Project" means any of the following:

(1) A proposed residential development of more than 500 dwelling units.

(2) A proposed shopping center or business establishment employing more than 1,000 persons or having more than 500,000 square feet of floor space.

(3) A proposed commercial office building employing more than 1,000 persons or having more than 250,000 square feet of floor space.

(4) A proposed hotel or motel, or both, having more than 500 rooms.

(5) (A) Except as otherwise provided in subparagraph (B), a proposed industrial, manufacturing, or processing plant, or industrial park planned to house more than 1,000 persons, occupying more than 40 acres of land, or having more than 650,000 square feet of floor area.

(B) A proposed photovoltaic or wind energy generation facility approved on or after the effective date of the amendments made to this section at the 2011-12 Regular Session is not a project if the facility would demand no more than 75 acre-feet of water annually.

Though the proposed project meets none of the above classes of “Project,” staff reviewed other documents that provide guidance to those involved in water resource planning. Further guidance for how to interpret these sections of the Water Code is provided in a California Department of Water Resources document titled “Guidebook for Implementation of Senate Bill 610 and Senate Bill 221 of 2001 (DWR, 2003).”

A helpful interpretive section on page 3 of the Guidebook, explains how to interpret item (1) above. It states that one dwelling unit typically consumes 0.3 to 0.5 acre-feet of water per year (DWR, 2003). Therefore 500 dwelling units could be interpreted to mean 150 to 250 acre-feet per year. The proposed project would only use up to 134 acre-feet per year in a hot year, and 115 acre-feet per year in a typical year. Relative to the baseline (290 acre-feet per year) the proposed HBEP would use (–)175 acre-feet per year. The negative indicates a reduction in use and indicates that the project should be considered a recharger of water to the local system. The proposed HBEP therefore does not meet the criteria of item (1).

The Guidebook also provides guidance about how to interpret other items in the list, but the one central theme is that Water Supply Assessments are necessary for projects that increase the demand on the local system substantially. The Guidebook also emphasizes that Water Supply Assessments are necessary in areas with a poorly understood water supply, or in an area where the project would increase the demand substantially, or 10-percent (DWR, 2003). The project is located in a very well studied service area with many service connections, but above all, the project does not increase the demand on the system, it would actually decrease the demand on the system.

LOCAL LORS

Staff concludes that with the implementation of Condition of Certification **SOIL&WATER- 5,** HBEP would satisfy the applicable requirements of all local LORS by paying necessary local connection fees to the city of Huntington Beach for water supply and sanitary sewer disposal services.

NOTEWORTHY PUBLIC BENEFITS

- The proposed project would reduce the amount of water used relative to baseline conditions. The reduction in water use would be about 175 AFY, which would result in additional supplies for other beneficial uses.
- The proposed project would result in a 0.16 MGD reduction in industrial waste water volume to the Pacific Ocean and a similarly proportional decrease in pollutant loading
- The proposed project would result in the elimination of once-through cooling from the existing Huntington Beach Generating System. 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

No agency or public comments were received regarding Soil and Water Resources.

CONCLUSIONS

- The proposed project would use potable water. However, it reduces the amount of water used relative to baseline conditions (Huntington Beach Generating Station). The reduction in water use would be about 175 acre feet per year (AFY), which would result in additional supplies for other beneficial uses.
- Although the project would reduce potable water use relative to baseline conditions, staff conducted additional analysis to evaluate whether secondary effluent from a nearby wastewater treatment plant could be used as an alternative supply. Staff investigated a number of potential routes and ways to reduce costs to deliver secondary effluent to the project site, but none were found to be economically or technically feasible.
- The proposed project would result in a 0.16 million gallon per day (mgd) reduction in industrial waste water volume to the Pacific Ocean and a similarly proportional decrease in pollutant loading.
- The proposed project would result in the elimination of once through cooling from the existing Huntington Beach Generating System. Once-through cooling water from the Pacific Ocean would be replaced by city of Huntington Beach municipal supply water.

- 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 **SOIL&WATER-1** would adequately minimize soil loss.
- Staff proposes Condition of Certification **SOIL&WATER-1,** which would require the proposed project to comply with the Clean Water Act and obtain discharge permits for construction through the State Water Resources Control Board. This condition would ensure that the impacts to waters of the United States from construction would be less than significant.
- Staff proposes Condition of Certification **SOIL&WATER-2**, which would require the proposed project to comply with Permit Order No. R8-2009-0003, NPDES NO. CAG998001, 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-3,** which would require the proposed project to comply with the Clean Water Act and obtain discharge permits for operation through the State Water Resources Control Board. This condition would ensure that the impacts to waters of the United States from dewatering discharge would be less than significant.
- Groundwater at the site is relatively shallow and potentially contaminated by petroleum products. Trench and foundation excavations would likely encounter shallow groundwater and dewatering would be required for stabilization. If the applicant engages in dewatering, staff would recommend that the applicant comply with Condition of Certification **SOIL&WATER-4**, which would require the applicant to apply for coverage under a permit that would allow for the discharge of petroleum-contaminated water.
- Staff proposes Condition of Certification **SOIL&WATER-5**, which would require the proposed project to comply with the city of Huntington Beach code, Title 14 Water and Sewers. This condition would ensure that connections to the city’s water and sewer system are completed appropriately and that annual fees are paid to the city.
- Staff proposes Condition of Certification **SOIL&WATER-6**, which would limit the proposed project’s water use to 115 acre-feet per year and require regular water use reporting to the Commission.
- Staff proposes Condition of Certification **SOIL&WATER-7**, which would require the applicant to install water meters.
- The proposed project is located in Zone X and protected from the one-percent annual chance of flooding (100-year flood) by an accredited levee along the Huntington Beach Channel.

- Recent Energy Commission studies show the Huntington Beach vicinity is at increased risk of flooding due to relative sea level rise. However the proposed site would be sufficiently above sea level to ensure power plant reliability. Even with high-end estimates of relative sea-level rise of 61 centimeters (2.0 feet) by 2050 (relative to 2000) (NAS, 2012), the site would still be about 2.0 feet above the current (2012) 100-year floodplain (FEMA, 2012).
- 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. Development of alternative water supplies for remaining industrial uses does not appear to be feasible. In addition, the project would use a number of systems to reuse wastewater and reduce wastewater volume. Staff believes the project water use is consistent with Energy Commission water policy.
- The proposed project helps the entire Huntington Beach Generating Station move away from once-through-cooling (OTC). 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.

PROPOSED CONDITIONS OF CERTIFICATION

NPDES CONSTRUCTION PERMIT REQUIREMENTS

SOIL&WATER-1: The project owner shall manage stormwater pollution from HBEP 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 HBEP project.

Verification: Thirty (30) days prior to site mobilization of HBEP construction activities, the project owner shall submit the construction SWPPP to the CBO and CPM for review and the SWRCB for review and timely 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 Santa Ana 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 WATERDISCHARGE PERMIT REQUIREMENTS

SOIL&WATER-2: Prior to initiation of hydrostatic testing water discharge to surface waters, the project owner shall obtain a 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. R8-2009-0003, NPDES NO. CAG998001 for hydrostatic testing water discharge. The project owner shall provide a copy of all permit documentation sent to the Santa Ana Regional Water Quality Control Board or State Water Quality 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 Santa Ana Regional Water Quality Control Board or State Water Quality Control Board. Thirty (30) days prior to HBEP 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.

GROUNDWATER DISCHARGE PERMIT REQUIREMENTS

SOIL&WATER-3: Discharge of dewatering water shall comply with the Santa Ana 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 is 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.

NPDES INDUSTRIAL PERMIT REQUIREMENTS

SOIL&WATER-4: Prior to mobilization for construction, the project owner shall obtain a National Pollutant Discharge Elimination System permit for industrial waste and stormwater discharge to the Pacific Ocean. The project owner shall discharge to the same outfall currently utilized by the Huntington Beach Generating Station under the requirements of Order No. R8-2010-0062, NPDES No. CA0001163. The project owner shall provide a copy of all permit documentation sent to the Santa Ana or State Water 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 Santa Ana or State Water Board. Thirty (30) days prior to HBEP 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-5: The project owner shall pay the city of Huntington Beach all fees normally associated with industrial connections to the city's sanitary sewer or water supply system as defined in the city's code, Title 14 Water and Sewers.

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 project's connections to the water and sewer systems. Fees paid to the city shall be reported in the Annual Compliance Report (ACR) for the life of the project.

WATER USE AND REPORTING

SOIL&WATER-6: Water supply for project operation and construction shall be potable water supplied from the city of Huntington Beach. Water use for operation of the Huntington Beach Energy Project shall not exceed 134 AFY; water use for construction shall not exceed 22 AFY. A monthly summary of water use shall be submitted to the CPM.

Verification: The project owner shall record HBEP 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 HBEP construction water use on a daily basis and shall notify the CPM within 14 days upon forecast to exceed the maximum annual use of 22 AFY of potable water. Prior to exceeding the maximum use, the owner shall provide a plan to modify construction practices or offset excess water use.

The project owner shall submit a water use summary report to the CPM monthly during construction and annually in the ACR 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 METERING

SOIL&WATER-7: Prior to the use of a water source during commercial operation, the project owner shall install and maintain metering devices as part of the water supply and distribution system to monitor and record in gallons per day the total volume(s) of water supplied to the HBEP from the water source. Those metering devices shall be operational for the life of the project and must be able to record the volume from each source separately.

Verification: At least thirty (30) days prior to use of any water source for HBEP operation, the project owner shall submit to the CPM evidence that metering devices have been installed and are operational. The project owner shall provide a report on the servicing, testing, and calibration of the metering devices in the annual compliance report.

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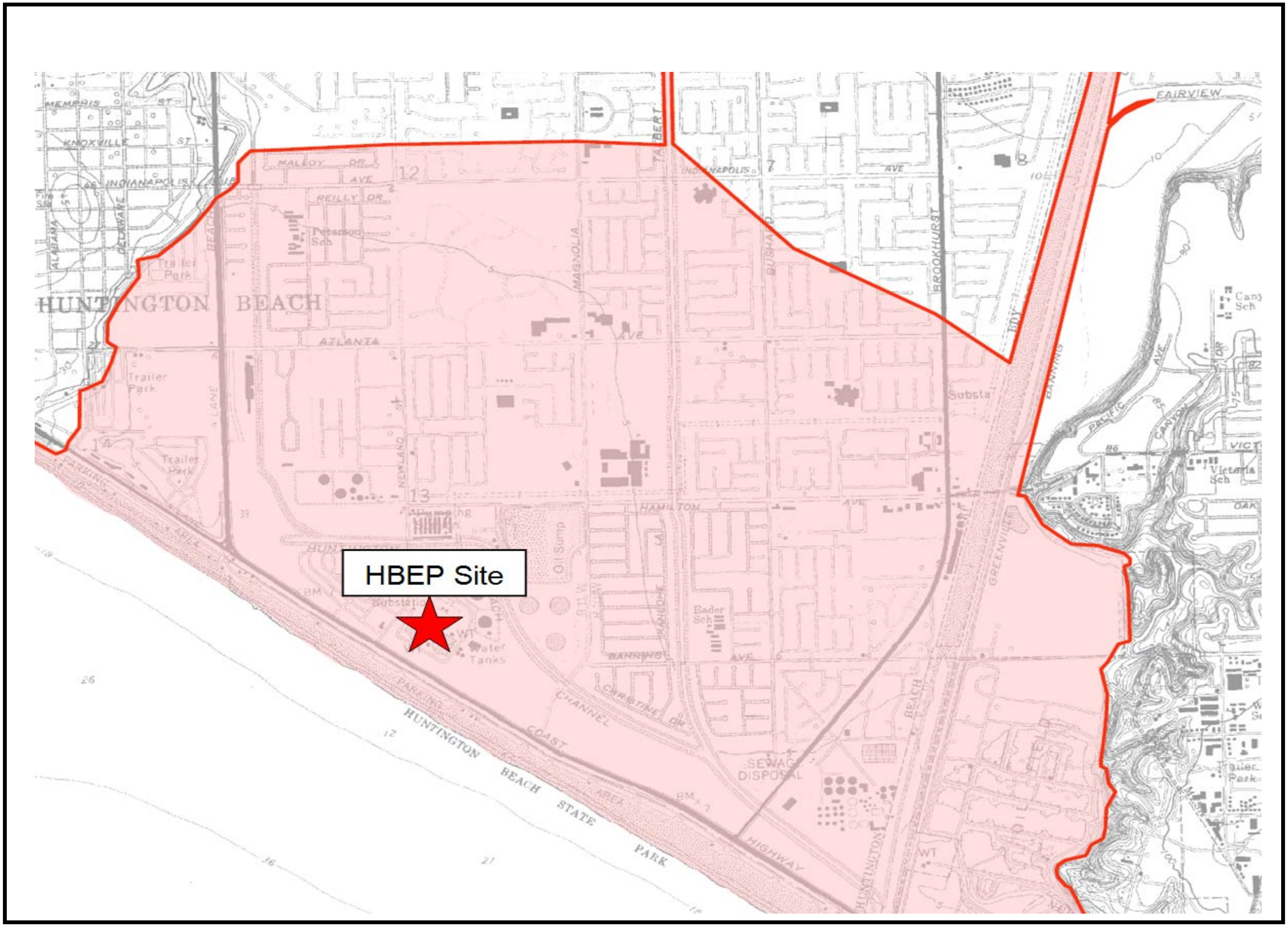
SOIL & WATER - FIGURE 1
Huntington Beach Energy Park

SOIL & WATER - FIGURE 2
Huntington Beach Flood Zones (FEMA, 2009)

SOIL & WATER - FIGURE 3

Huntington Beach Tsunami Inundation Zone (CEMA, 2009)



TRAFFIC AND TRANSPORTATION

Testimony of Jonathan Fong

SUMMARY OF CONCLUSIONS

Energy Commission staff has analyzed the information provided in the Application for Certification (AFC) and acquired from other sources to determine the potential for the Huntington Beach Energy Project (HBEP) to have significant adverse traffic and transportation-related impacts. Staff has also assessed the potential for mitigation proposed by the applicant and conditions of certification developed by staff to reduce any potential impacts to a less than significant level, as well as the feasibility and enforceability of those proposed mitigations and recommended conditions.

Staff concludes that upon implementation of proposed Conditions of Certification **TRANS-1** through **TRANS-7** project related impacts would be reduced to less than significant level and the project would comply with all applicable laws, ordinances, regulations, and standards pertaining to traffic and transportation.

INTRODUCTION

In compliance with the California Environmental Quality Act (CEQA) and Energy Commission requirements, this analysis identifies the HBEP's potential impacts to the surrounding transportation systems and proposed mitigation measures (conditions of certification) that would avoid or lessen these impacts. It also addresses the project's consistency with applicable federal, state, and local transportation-related laws, ordinances, regulations, and standards (LORS).

APPLICANT-PROPOSED IMPROVEMENTS AND TRAFFIC MEASURES

The applicant has proposed a Construction and Demolition Transportation Management Plan (TMP) to ensure that construction and operation of HBEP would result in less than significant traffic impacts (HBEP 2012a). The TMP would include:

- Potential rerouting and rescheduling construction traffic along Highway 1 to reduce traffic at affected intersections.
- Monitoring of Beach Boulevard/ Highway 1 and Brookhurst Street/ Highway 1 intersections,
- Timing of construction deliveries and implementation of traffic control measures (flag persons, temporary lane closures, and signage).
- Restoration of damaged roadways.
- Construction timing and mitigation plan coordinated with affected local agencies.

The applicant's proposed mitigation measures in the TMP are similar to staff's proposed Conditions of Certification **TRANS-1** through **TRANS-3** which are discussed in greater detail in the "Direct/Indirect Impacts and Mitigation" subsection below.

SETTING

The proposed HBEP site is located within the incorporated city of Huntington Beach at the northeast corner of the intersection of Pacific Coast Highway (PCH, State Highway 1) and Newland Street. The site is currently developed with an operating electrical generation facility.

The HBEP site is located in the coastal zone of Huntington Beach within western Orange County. The area is largely built out with a range of residential, commercial and industrial land uses. See the **LAND USE** section for a discussion of the surrounding land uses. The city of Huntington Beach roadway system is a predominantly grid network with roadways connecting north to I-405 (Huntington Beach Freeway) and south to PCH. See **Traffic and Transportation Figure 1** for a regional map of roadways and surrounding cities.

The applicant has identified off-site equipment laydown and construction workforce parking areas that would be used during project construction. Equipment laydown would occur on a 16-acre undeveloped portion of the existing AES Alamitos Generating Station (AGS). AGS is approximately 12 miles from the project site located in the southeast portion of the city of Long Beach along the San Gabriel River. The AGS site is situated on the northeast corner of the intersection of North Studebaker Road and E 2nd Street. North Studebaker Road provides access from the Naples area of Long Beach to State Route 22 (Garden Grove Freeway). E 2nd Street provides an east/ west connection from Long Beach to the Long Beach Freeway (I-405). The portion of AGS that would be used for construction equipment laydown is bordered by marsh lands and the San Gabriel River.

Construction workforce parking would be provided in four off-site and one-site areas. The proposed parking areas are identified in **Traffic and Transportation Figure 4.** Two parking areas would be located in the city of Huntington Beach parking lots south of the intersection of Beach Boulevard and PCH. This area directly abuts the beach to the south with resort hotels to the north. One parking area would be located on an unpaved dirt lot directly west of the project site along Newland Street which abuts an existing mobile home park. A portion of the existing but non-operational Plain America tank farm located directly east of the project site would also be used for construction parking. The applicant has identified an area on-site that would be used for limited construction worker parking.

Construction of the HBEP would require the delivery of large components by way of heavy/ oversized trucks from the Port of Long Beach to the project site. The use of heavy/oversized trucks would be subject to the permitting requirements of the local cities and counties 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.**

Refer to the **PROJECT DESCRIPTION** section 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 this project.

Traffic and Transportation Table 1
Laws, Ordinances, Regulations, and Standards (LORS)

Applicable LORS	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.
Local	
City of Huntington Beach General Plan, Infrastructure and Community Services Chapter III, 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.
2011 Orange County 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.

Applicable LORS	Description
City of Seal Beach Municipal Code	Requires an oversize vehicle permit for vehicles, mobile equipment or loads which exceed the requirements of the Vehicle Code
City of Long Beach Municipal Code	
Orange County Code	
Los Angeles County Code	
City of Huntington Beach Municipal Code	

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[1]; 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 Huntington Beach Circulation Element classifies roadways in the city limits based on the average daily trips (ADT). The following describes the local and regional roadways that would be used for construction and operational traffic accessing the proposed project site. The regional roadways are shown in **Traffic and Transportation Figure 1.** The local roadways within the Huntington Beach city limits are shown in **Traffic and Transportation Figure 2**.

Existing Regional and Local Transportation Facilities

Pacific Coast Highway (PCH, State Highway 1): PCH is under the California Department of Transportation (Caltrans) jurisdiction and subject to state design standards. The Orange County Transportation Authority (OCTA) designates PCH as a Smart Street Arterial. Smart arterials are six to eight lane roadways of enhanced capacity due to the implementation of signal synchronization, bus turnouts and other traffic improving techniques. Smart streets carrying capacities can range from 60,000 to 79,000 vehicles per day. PCH provides inter-regional access connecting the city of Huntington Beach coastal communities.

Beach Boulevard (State Route 39): Beach Boulevard is the other Smart Street Arterial located within the city. Beach Boulevard is a six to eight lane arterial and is the major north south roadway in the city connecting PCH to I-405 (Huntington Beach Freeway).

Brookhurst Street: Brookhurst is a north/south Major Arterial which connects PCH through the city of Fountain Valley. Brookhurst is a six lane divided roadway with a carrying capacity of up to 50,000 vehicles per day.

Magnolia Street: Magnolia is a north/south Primary Arterial which is a four lane divided roadway connecting PCH north through the city of Huntington Beach to the city of Fountain Valley. Maximum daily traffic volume is 35,000 vehicles per day. Magnolia Street is the first Primary Arterial south of the project site directly adjacent to the Magnolia Marsh.

Newland Street: Newland Street is a Secondary Arterial which borders the project site to the north. Newland runs north/south from PCH to I-405 and as a secondary arterial has a daily maximum carrying capacity of 25,000 vehicles.

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[1] The FAA recommends that pilots avoid overflight of plume-generating industrial sites below 1,000 feet AGL (FAA 2006).

Heavy/ Oversized Truck Route

The HBEP would include the delivery of large components of the facility via heavy/ oversized deliveries. The deliveries would come from either the Port of Long Beach or via rail to an existing rail line on Anaheim Street, which are both located within the city of Long Beach. A map of the planned truck route is shown in **Traffic and Transportation Figure 3.** The deliveries would originate from the port or the rail line and would travel to the off-site laydown area at AES Alamitos. The applicant anticipates approximately 112 oversize trips would be required for the project. Three trips would be planned on any given night occurring between the hours of 10 p.m. and 4 a.m (HBEP 2012b).

The oversized vehicles are expected to be a maximum of 15’6” tall, 20 feet wide and 135 feet long. Due to the size of the transport vehicles, the applicant would be required to use pilot vehicles escorted by California Highway Patrol (CHP) personnel. In accordance with permit requirements, the applicant would be responsible for rolling road closures, temporary no parking and establishing alternative traffic routes along the truck route.

Prior to any transport of heavy/ oversized equipment, the applicant would employ a preconstruction crew to make necessary temporary improvements along the route. These may include the temporary relocation of low hanging power and utility lines, street signals, and median landscaping. All preconstruction work would be done in accordance with local jurisdiction permitting requirements and would be returned to preconstruction condition following transport.

The delivery of components from the Port of Long Beach and AES Alamitos to the HBEP would occur under “just in time delivery.” Large components would be lifted from the truck trailer and put directly into place, thereby minimizing temporary storage of equipment at HBEP (HBEP2013a). A list of the potentially affected roadways for the heavy/ oversized truck route is listed in **Traffic and Transportation Table 2** listed below. Staff contacted the affected local agencies to determine permitting requirements for oversized truck deliveries and recommended routes. 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 as those proposed as part of HBEP. 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 of proposed Condition of Certification **TRANS-3** which would require the applicant to obtain all necessary permits from affected jurisdictions for the transportation of heavy/ oversized equipment associated with the HBEP project.

Traffic and Transportation Table 2
Heavy/ Oversized Truck Route, Affected Roadways

County	City	Roadway
Los Angeles	Long Beach	Harbor Plaza*
		Pico Avenue*
		10th Street*
		9th Street*
		Santa Fe Avenue*
		W. Anaheim Street
		Magnolia Avenue
		Ocean Boulevard
		Alamitos Avenue
		Anaheim Street
		Pacific Coast Highway
		2nd Street
		N. Studebaker Road
Orange	City of Seal Beach	Pacific Coast Highway
	City of Huntington Beach	Pacific Coast Highway
		Goldenwest Street
		Garfield Avenue
		Beach Blvd
		Newland Street

*Port of Long Beach Delivery Option

Level of Service (LOS)

To quantify the existing baseline traffic conditions, state highways, roadways, and intersections in the study area were analyzed in the 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 HBEP are established by and under the jurisdiction of two different agencies: the Orange County Transportation Authority (OCTA) and the city of Huntington Beach. Staff used these LOS standards to evaluate potential HBEP-generated traffic impacts. The following is a list of the applicable LOS standards:

- Orange County Congestion Management Program (CMP)
  The CMP, which is under the jurisdiction of OCTA, establishes that the lowest acceptable performance standard for CMP intersections is LOS E. Seven CMP intersections are located within the city of Huntington Beach, but only one would be affected by the HBEP: Beach Boulevard at PCH.
- City of Huntington Beach 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, CE2.1.1, requires the minimum level of service standard for city intersections during peak hours is LOS D.

OTHER TRANSPORTATION SYSTEMS

Freight and Passenger Rail

A Union Pacific Railroad rail line is located in the city which parallels Gothard Street and runs north/ south from the northern city limits to just north of Garfield Avenue. Several spur lines provide access to manufacturing uses and lumber yards. There are currently no passenger rail lines within the city limits.

Bus Service

The Orange County Transportation Authority (OCTA) provides public transportation in the city. Within the city limits, OCTA operates 16 bus lines providing local and regional service. To encourage ridership, two park and ride facilities are located within the city. The facilities are located at the Goldenwest Transit Center at Gothard Street and Center Avenue and at the McDonnell Douglas Corporation at Bolsa Avenue and Bolsa Chica Street.

Bicycle and Pedestrian Facilities

The city of Huntington Beach provides a comprehensive network of Class II (on-street, striped) bicycle lanes throughout the city. PCH includes Class II and Class I (off road, paved) bicycle lanes connecting the state and city beaches. The roadways in the project area provide paved pedestrian sidewalks which provide access to the Huntington Beach bike trial and beach access along PCH.

Airports/ Helipads

The nearest public airport is John Wayne/ Orange County Airport which is approximately six miles east of the project site. There are six private or public helipads within seven miles of the project site. The nearest helipads are operated by the city of Huntington Beach at the civic center and the police department which are 2.5 and 3.5 miles away respectively.

DIRECT/INDIRECT IMPACTS AND MITIGATION

The direct and indirect impacts of the proposed HBEP on traffic and transportation system are discussed in this section and based on an analysis comparing pre-HBEP and post-HBEP conditions. Staff evaluated the HBEP's 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. The below 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. The traffic analysis conducted by the applicant estimates that the existing LOS along the heavy haul route during transport would be LOS A. The potential impacts as a result of the trips would be minimal. Staff's proposed Condition of Certification **TRANS-3** would require the applicant to obtain the necessary oversize/overweight permits from the appropriate jurisdictions for the transport of components from the Port of Long Beach to AES Alamitos and to the HBEP site. Upon implementation of **TRANS-3,** there would be less than significant impacts resulting from heavy/ oversized loads associated with the HBEP.

Truck Traffic

Construction equipment deliveries and construction-related truck traffic would contribute additional trips during the construction period. Equipment deliveries and construction truck traffic were estimated using a passenger car equivalent (PCE) factor of 1.5 cars per truck. Using this conversion, the anticipated 48 peak construction truck trips would generate approximately 72 PCE average daily trips. As summarized in the **Traffic and Transportation Table 4** below, 10 truck trips would occur in the AM peak hour and 10 in the PM peak hour. The remaining truck trips would occur during typical construction work hours throughout the remainder of the day.

Oversized or overweight trucks with unlicensed drivers could present significant hazards to the general public and/or damage roadways. To ensure that trucks comply with weight, size, and route limitations set by the city of Huntington Beach, county of Orange and Caltrans, and that drivers are properly licensed, staff has included Condition of Certification **TRANS-1** to require the project owner to obtain roadway permits for vehicle sizes and weights, driver licensing, and truck routes. However, even properly sized and licensed trucks could damage roadways, creating significant public hazards; for this reason, staff has recommended Condition of Certification **TRANS-2**, which requires that the project owner repair and restore all roads damaged during construction activities.

Total Construction Traffic

The HBEP construction period is proposed to begin in the first quarter of 2015 commencing with the demolition of existing electricity generating units. The estimated completion of construction is the third quarter of 2022. The maximum number of workers is estimated to be 331 workers during peak the construction period (HBEP 2013t TN 69961).

The total workforce and truck trips generated during peak construction would be 734 daily one-way trips (662 worker trips added to 72 PCE truck trips). Approximately 672 of these one-way trips would occur during peak hours: 336 during the morning and evening peak hours (HBEP 2012a). **Traffic and Transportation Table 4,** summarizes all peak construction traffic generated by the HBEP.

Traffic and Transportation Table 4
One-Way Trips during Construction Period

Vehicle Type	Average Daily Trips (ADT)	AM Peak Hour[3] Trips		PM Peak Hour[4] Trips	
-	-	In	Out	In	Out
Delivery/ Haul Trucks[1]	48	3	3	3	3
PCE (1.5)[2]	72	5	5	5	5
Workers	662	331	-	-	331
Total Construction Traffic In PCE	734	336	5	5	336

[1]Worker traffic during the peak construction period. These figures assume the worst case traffic scenario of one worker per car.
[2] Passenger Car Equivalent (PCE) is a ratio of 1.5 passenger cars for each truck.
[3] The AM peak hour is 7:00 a.m.-9:00 a.m.
[4] The PM peak hour is 4:00 p.m.-6:00 p.m.
Source: HBEP2012a

Traffic and Transportation Table 5
Affected Intersections: AM Peak Hour Trips and LOS during Peak Construction

Intersection	AM Peak Hour			
	Existing		With Project	
	Delay (seconds)	LOS	Delay (seconds)	LOS
Beach Boulevard and Highway 1	40	D	45	D
Newland Street and Highway 1	9	A	16	B
Newland Street and Hamilton Avenue	10	A	11	B
Brookhurst Street and Highway 1	37	D	37	D
Magnolia Street and Highway 1	13	B	13	B

Traffic and Transportation Table 6
Affected Intersections: PM Peak Hour Trips and LOS during Peak Construction

Intersection	PM Peak Hour			
	Existing		With Project	
	Delay (seconds)	LOS	Delay (seconds)	LOS
Beach Boulevard and Highway 1	57	E	61	E
Newland Street and Highway 1	8	A	8	A
Newland Street and Hamilton Avenue	14	B	22	C
Brookhurst Street and Highway 1	121	F	122	F
Magnolia Street and Highway 1	15	B	15	B

For affected local road segments, **Traffic and Transportation Table 5** and **Table 6** compare the existing AM and PM peak hour LOS during the peak construction period. As reflected in **Traffic and Transportation Table 6** above, two intersections have been identified as currently operating below LOS D during the PM peak hour: Beach Boulevard/ PCH and Brookhurst Street/ PCH. In the worst case scenario for traffic impacts associated with the HBEP, the project would result in a 7 percent increase in traffic at the Beach Blvd./Hwy 1 intersection and a less than 1 percent increase in traffic at the Brookhurst St./PCH intersection. While the temporary increase in traffic due to construction operations is minimal, two of the affected intersections presently operate below adopted LOS thresholds. To avoid worsening the LOS at these intersections, staff is recommending Condition of Certification **TRANS-3** which would require the applicant to develop a Traffic and Control Plan (TCP). The TCP would require the applicant to monitor affected intersections and provide alternate routes and if necessary avoid the existing failing intersections to ensure minimal impacts to local roadways during project construction.

Linear Facilities

The HBEP 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.

Construction Workforce Parking and Laydown Area

HBEP construction would require 331 workers on-site during the peak construction period (HBEP2012a). The applicant has proposed on-site and off-site parking areas to accommodate the workers. The proposed parking areas are listed in **Traffic and Transportation Table 7** below and are identified in **Traffic and Transportation Figure 4.** The parking areas designated by the applicant would accommodate over 1,000 parking spaces which would be more than adequate for the highest number of workers anticipated for HBEP construction.

Traffic and Transportation Table 7
HBEP Construction Parking Areas

Parking Area Location	Parking Area size	Number of Spaces (approximately)
On-site at HBEP	1.5-acres	130
Plains All American Tank Farm, adjacent to HBEP	1.9-acres	170
Graded area West of HBEP site on Newland Street	3-acres	300
Graded area NE corner of PCH and Beach Blvd.	2.5-acres	215
Huntington Beach City Parking Area SW corner of PCH and Beach Blvd.	N/A	225
Total Number of Spaces		1,040

Source: Adaptation from HBEP2012a

The applicant proposes to use shuttles to transport construction workers from the off-site parking areas to the project site. The applicant estimates the number of shuttle trips would be13 round trips from the city of Huntington Beach parking area, 13 round trips from the parking area at the corner of PCH and Beach Boulevard, and 10 trips from the Plains All American Tank Farm. (HBEP2012b). Based on the off-site parking proposal, the amount of construction parking spaces is more than adequate to park the construction workforce during the peak construction period. Staff is recommending Condition of Certification **TRANS-3** which would require the applicant to prepare a traffic control plan to ensure all construction workers parking is in place as designated in this analysis. Upon implementation of the plan, construction workforce parking impacts would be less than significant.

Transportation of Hazardous Materials and Waste

During construction, no acutely hazardous materials would be used or stored onsite. The low-level hazardous materials planned for use during construction include gasoline, diesel fuel, oil, lubricants, cleaners, solvents, adhesives, and paint materials. Transportation of these materials would pose less than significant hazards to the public.

Please refer to the **HAZARDOUS MATERIALS MANAGEMENT** section for a detailed description of hazardous waste associated with the project and proposed conditions of certification for the HBEP.

Aviation Impacts

The HBEP site is approximately 6 miles west of the nearest public airport. There would be no aviation impacts anticipated as part of the construction of HBEP. 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. For project compliance with FAA regulations, staff is proposing Condition of Certification **TRANS-6**, which would require the project owner to submit a Form 7460-1 “Notice of Proposed Construction or Alteration” to the FAA for any construction equipment (e.g. cranes) that may exceed the height restrictions.

HBEP Construction Impacts Conclusion

With implementation of the conditions of certification discussed in this analysis, construction of the HBEP would result in less than significant impacts to the traffic and transportation system in the project vicinity.

Operational Impacts and Mitigation

Workforce Traffic

The construction of HBEP Block 1 is expected to be completed in the fourth quarter of 2018 and Block 2 to be completed by the second quarter of 2020. The facility would be staffed by 33 permanent workers in three rotating shifts (HBEP 2011a).

The existing electrical generating facility at the HBEP site is currently in operation and employs 33 workers (HBEP2013b). The current and proposed operations workforce is summarized in **Traffic and Transportation Table 8**.

Traffic and Transportation Table 8
Existing Huntington Beach Generating Station Plant Operation Workforce

Classification	Current HBGS	Proposed HBEP
Plant Manager	1	1
Operations Leader	1	1
Maintenance Leader	2	1
Environmental Engineer	1	1
Maintenance Planner	1	1
Power Plant Operators	16	20
Controls Specialty	5	5
Mechanic	4	2
Admin	2	1
Total	33	33

Source: HB2013b
*HBGS: Huntington Beach Generating Station which is the existing electrical generating facility in operation at the project site.

Upon full operation of the HBEP and following the demolition of all existing electrical generating facilities, there would be no net increase in workforce traffic as part of HBEP. The applicant anticipates the trip distribution for operations to be: approximately 33 percent from the city of Long Beach and communities northwest of the site, 33 percent from the city of Garden Grove and communities north of the site, and 33 percent from the city of Irvine and communities southeast of the site. There would be a minimal increase in traffic and operations traffic would have a less than significant impact on overall LOS at studied intersections workers may use to access the project site.

Truck Traffic and Hazardous Materials Delivery

Upon operation, the HBEP would require 10 to 12 hazardous materials truck trips per month. These materials may include ammonia, cleaning solvents, diesel fuel, lubricants and other materials associated with HBEP operation. During project operation, aqueous ammonia, a regulated substance, would be delivered to the HBEP facility in accordance with Vehicle Code Section 32100.5, which addresses the transportation of hazardous materials that pose an inhalation hazard (HBEP 2011a). This section of the Vehicle Code requires the transporters of hazardous materials to use adopted travel routes and to avoid heavily populated or congested areas. The applicant's proposed routes for hazardous material deliveries are generally the same as for regular truck deliveries. The routes used would be via I-405 to Beach Blvd. to PCH to Newland to the HBEP project site. The approximately six-mile long route is characterized predominantly by commercial and retail uses. There is an increase in hotels, single family and multi-family residential uses along Beach Blvd., south of Adams Ave. nearer the coast. Beach Blvd. is a Caltrans maintained State Route (SR39) which is the most direct route from I-405 to the project site and is an adopted truck route by both Caltrans and the city of Huntington Beach.

Delivery of aqueous ammonia may be hazardous to the public if a spill were to occur. Therefore, staff recommends Condition of Certification **TRANS-5** to ensure that the project owner contracts with licensed hazardous materials and waste hauler companies that comply with all applicable regulations and obtain the proper permits and/or licenses from Caltrans and the county of Orange. For more information on hazardous materials used during project operation and applicable regulations, see the **HAZARDOUS MATERIALS MANAGEMENT** section of this Staff Assessment.

Parking

As indicated earlier, operations of the HBEP would employ a total of 33 operations staff. The plant would be operated in three rotating shifts and staffed 24 hours a day, seven days a week. As shown in Figure 2.1-1, 'General Arrangement/ Site Plan,' in the AFC, workforce parking would be provided adjacent to the administration/ maintenance building and would provide sufficient on-site parking. See the **LAND USE** section for additional information regarding parking and site plan configurations.

Emergency Access

Energy Commission staff does not anticipate emergency access issues to the project site. The site is directly accessed via Newland Avenue which would not present any obstructions or design challenges for emergency vehicles to access the site. Staff has recommended Condition of Certification **TRANS-3** which includes a requirement that the Traffic Control Plan demonstrates and ensures sufficient access. On-site circulation of emergency vehicles would be subject to site plan review by the city of Huntington Beach Fire Department per conditions of certification in the **WORKER SAFETY AND FIRE PROTECTION** section of this Staff Assessment.

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. No structures are proposed that would exceed 200 feet in height. The tallest structures would be the power block stacks which would be 120 feet tall (HBEP2012a). These stacks would be shorter than the 200-foot height threshold, meaning that they would not penetrate navigable airspace and would not require notification of the FAA.

Thermal Plumes

The HBEP gas turbines and air cooled condensers (ACC) have the potential to generate thermal plumes during worst case conditions. These conditions would be full operation of HBEP during calm or very low wind meteorological conditions. 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.

In the vicinity of the HBEP, there is a potential for low flying aircraft to be affected by the thermal plumes. Helicopters and small aircraft are routinely observed flying along Huntington Beach and areas near the project site.

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 HBEP would exceed 4.3 m/s between 500 feet and 1,740 feet above the HBEP under worst case conditions. This would generate a potential impact to aircraft if they were to fly over the HBEP at low altitude. Therefore, staff has proposed Condition of Certification TRANS-7 which would require notification in accordance with FAA requirements to advise pilots of the potential overflight hazard associated with thermal plumes generated by the HBEP and the need to avoid overflight below 1,740 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-7 the potential impacts to aviation would be less than significant. Based on the small number of aircraft likely to fly over the HBEP and the presence of available flight paths to avoid the thermal plumes, pilots would have the ability to safely avoid the HBEP thermal plumes. See Appendix TT-1 for detailed results of staff's plume velocity analysis for the HBEP.

HBEP Operation Impacts Conclusion

With implementation of the conditions of certification discussed above, impacts to ground and air transportation from operation of the HBEP would be less than significant.

CUMULATIVE 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.

Cumulative Traffic Impacts

Staff reviewed known past, current, and probable future projects in the vicinity of the proposed HBEP project, which staff defined as the city of Huntington Beach, and the surrounding cities of Seal Beach and Newport Beach. Trips generated by these projects occur within the transportation network used by HBEP and may combine with HBEP trips to result in 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 9** below.

Projects identified in the cumulative projects list have either included mitigation measures requiring the payment of fees to the city of Huntington Beach in accordance with Chapter 17.65 of the Municipal Code "Fair Share Traffic Impact Fee" or been required to make road improvements to directly reduce the traffic impacts associated with their project. Payment of these fees would ensure the direct impacts to affected roadways would be addressed as part of the city's Capital Improvement Program or the road improvements required as part of the cumulative projects identified in **Traffic and Transportation Table 9** would directly reduce the potential impacts to within acceptable city LOS standards.

As discussed above, staff has determined that upon implementation of the recommended Conditions of Certification **TRANS-1** through **TRANS-4**, all traffic related direct impacts would be less than significant. All direct impacts with HBEP have been mitigated and the project's incremental effects would not be cumulatively considerable.

Traffic and Transportation Table 9
Development Considered in the Cumulative Condition[1]

Project Number	Project	Distance from Project Site	Project Description	Status of Project
1	**Archstone Residential Project**	6 miles N	Multifamily residential development of up to 510 units	Pending under City Review
2	**Ascon Landfill Site**	Within 1 mile N	Industrial and oil field waste removal from landfill	On-going/ monitor
3	**Beach and Ellis-Mixed Use Development**	3.5 miles N	274 unit apartment complex, including 8,500 sq ft of commercial property and 48,000 sq ft of open space.	Under Review The tentative map for this project is in process.
4	**Beach Walk**	2 miles N	Development of 173 multi-family apartment units within a 4-story building	Approved March 2012 Building permits in plancheck
5	**Beach and Warner Mixed Use Project**	4.75 miles N	Development of up to 279 residential units, 31,200 sq ft of retail space, and 6,000 sq ft of restaurant space, on 9.4 acres.	EIR certified 12/19/11 City in Litigation filed 1/23/12
6	**Brightwater**	6 miles NW	105.3 acre residential subdivision, including 349 single-family residences	Approved under construction
7	**Edinger Wal-Mart**	6 miles N	Development of a Wal-Mart in the existing, 100,000 sq ft vacant building	Under environmental review
8	**Former Lamb School Site**	3 miles NE	Construction of a Planned Unit Development (PUD) consisting of 81 detached single-family homes on 11.65 acres	No action taken by Planning Commission in Sept. 2012, No planned date for construction.
9	**Former Wardlow School Site**	2.15 miles NE	Construction of a PUD consisting of 49 detached single-family homes on 8.35 acres	No action taken by Planning Commission in Sept. 2012, no action taken. No planned date for construction.
10	**Harmony Cove**	6.75 miles NW	Development of a 23-boat slip marina, an eating and drinking establishment, and ancillary uses to the marina, on 2.28 acres	No action taken by Planning Commission in Oct. 2012, no action taken. No planned date for construction.
11	**Hilton Waterfront Beach Resort Expansion**	1 mile W	Expansion of existing resort, including a nine-story tower providing a total of 156 new guestrooms.	Approved by Planning Commission in March 2012. No planned date for construction.
12	**Huntington Beach Lofts**	6.15 miles N	Planned 385 residential units located on 3.8 acres	Planning Commission approved Sept 2012. No planned date for construction.
13	**The Boardwalk**	6 miles N	487 dwelling units and 14,500 sq ft commercial area on 12.5 acres	Planning Commission approved Feb. 2011. No planned date for construction.

Project Number	Project	Distance from Project Site	Project Description	Status of Project
14	**Oceana Apartments**	3.6 miles N	100 affordable housing units on 2 acres	Completed preliminary plan review Nov 2012. No planned date for construction
15	**Parkside Estates**	5.75 miles NW	50-acre parcel with 111-single family residences planned	Approved by Coastal Commission Oct 2012. No planned date for construction.
16	**Pierside Pavilion Expansion**	1.5 miles NW	Expansion of the existing Pierside Pavilion development	Approved by City Council Sept. 2012. No planned date for construction.
17	**Beach Boulevard/ Edinger Corridors Specific Plan**	Varies	Enhancement and maximizing of economic opportunities along Beach Blvd and Edinger Ave	Completed
18	**Bella Terra Costco**	6 miles N	Development of a Costco store on the former location of Mervyns and Montgomery Wards stores	Completed
19	**Pacific Shores Residential Project**	0.5 miles NW	204 multi-family residential units and 2 acre park	Completed
20	**The Strand**	1.6 NW	Hotel, retail, restaurants, and parking	Completed
21	**Pacific City**	1.3 miles NW	31-acre site broken into 3 parcels. One for 516 residential condos and two for commercial, retail and hotel	Entitlements approved 2004, permits pending
22	**The Ridge**	5.8 miles NW	5-acre site, looking to change current land use designations from Open Space-Park to Residential Low-Density to develop 22-single family residences	Project entitlements approved 2004, project amendment pending
23	**The Villa at Bella Terra**	6 miles N	Plans for 538 residential units, over 400,000 sq ft of commercial uses, and a hotel	Pending
24	**Beach Boulevard and Warner Avenue Intersection and Improvement Program (IIP)**	5 miles NW of project site	Widening Capacity Improvements- Beach Boulevard and Warner Avenue.	Project is for PS&E (plans, specifications, and estimates), environmental studies and right-of-way engineering only.
25	**Brookhurst Street and Adams Avenue IIP**	2.5 miles NE of project site	Widening Capacity Improvements- Brookhurst Street & Adams Avenue	Project is for PS&E and environmental studies and right-of-way engineering only
26	**Alamitos Energy Center**	15 miles NW of project site	Replacement of existing electrical generating facility with a new 1,995 MW natural gas-fired facility.	Under review by California Energy Commission

COMPLIANCE WITH LORS

Traffic and Transportation Table 10 provides an assessment of the HBEP's compliance with applicable laws, ordinances, and regulations (LORS) pertaining to traffic and transportation.

Traffic and Transportation Table 10
Project Compliance with Adopted Traffic and Transportation LORS

Applicable LORS	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-5** 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 HBEP would not include structures 200 feet tall or higher and does not exceed the 100 to 1 slope threshold of an operating airport and therefore does not require the project owner to file FAA Form 7460-1, Notice of Proposed Construction or Alteration. However, construction of the HBEP may involve cranes exceeding 200 feet in height. For project compliance with FAA regulations, staff is proposing Condition of Certification **TRANS-6**, which would require the project owner to submit a Form 7460-1 "Notice of Proposed Construction or Alteration" for construction equipment that would exceed 200 feet.
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.

Applicable LORS	Description	Consistency
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-5** (see above for explanation) ensures compliance.
California Vehicle Code, Sections 31600-31620	Regulates the transportation of explosive materials.	**Consistent.** The HBEP would not use explosive 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-5** (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-5** (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 are 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.

Applicable LORS	Description	Consistency
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 Huntington Beach and county of Orange with regard to encroachment into public rights-of-way, as required by **TRANS-4**.
California Health and Safety Code, Section 25160	Addresses the safe transport of hazardous materials	**Consistent.** 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. **TRANS-1** and **TRANS-5** (see above for explanation) require compliance.
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.** **TRANS-3** requires the project owner to prepare and implement a Traffic Control Plan.
Local		
City of Huntington Beach General Plan, Chapter III Circulation Element	Policy CE2.1.1.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.	**Consistent.** As shown in **Traffic and Transportation Tables 5** and **6,** the applicant has identified two of the affected intersections currently operate below LOS D, Beach Blvd/ PCH and Brookhurst St/ PCH. **TRANS-3** would require the applicant to prepare a Traffic Control Plan which would monitor the affected intersections and use alternate routes in the construction traffic.
City of Huntington Beach Municipal Code Chapter 17.65 Fair Share Traffic Impact Fee	Enables the city to implement transportation impact fee programs. Requires payment of fees that constitute the proposed project's fair share contribution towards construction costs of intersections and traffic signals or future city approved alternatives. The fee shall be assessed in accordance with the Fair Share Traffic Impact Fee Ordinance.	**Consistent.** The city of Huntington Beach reviewed the project and determined this fee would not be applicable (HB City 2013a).

Applicable LORS	Description	Consistency
City of Huntington Beach Municipal Code Title 10- Vehicles and Traffic, Section 10.32.040. Movement of Overloads.	Requires an oversize vehicle permit issued by the city of Huntington Beach director of public works for operation of vehicles that exceed weight or measurement requirements of the Vehicle Code.	**Consistent.** **TRANS-5** would require the applicant to obtain the necessary permits associated with the heavy haul plan and provide copies of the permit to the CPM.
County of Orange Code of Ordinances. Title 6 Highways, Bridges, Rights-of-Way, Division 4 Traffic Ordinances, Article 7 Size, Weight, and Load Sec. 6-4-701 Permits.	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 Orange County.	**Consistent.** **TRANS-5** see above explanation.
City of Seal Beach, Municipal Code Title 8 Vehicles and Traffic, Section 8.10.135 Movement of Oversize Vehicles.	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 the city of Seal Beach.	**Consistent.** **TRANS-5** see above explanation.
City of Long Beach Municipal Code Title 10 Vehicles and Traffic, Chapter 10.41 Use of streets by Overweight Vehicles. 10.41.020 Special Permit Required	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-5** see above explanation.
Los Angeles County Code, Title 16- Highways, Chapter 16.22 Moving Permits, and 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-5** see above explanation.

NOTEWORTHY PUBLIC BENEFITS

Neither the applicant nor staff has identified any traffic-related benefits associated with the proposed HBEP project.

RESPONSE TO AGENCY AND PUBLIC COMMENTS

The following comments have been received after the publication of the Preliminary Staff Assessment Part A (PSA Part A) and the Supplemental Focused Analysis for the Preliminary Staff Assessment Part A (FOSA Part A):

Comment: On November 3, 2013 the applicant submitted docketed comments on Part A of the Preliminary Staff Assessment (HBEP2013mm). The applicant proposed modifications to proposed Condition of Certification **TRANS-4** which clarifies the requirement for the applicant to obtain encroachment permits.

Staff response: Staff has reviewed the proposed change and has revised **TRANS-4** consistent with the applicant’s request.

Comment: The applicant noted a minor change to the “Setting” subsection.

Staff Response: Staff has reviewed the minor change to the “Settings” subsection and has made the necessary changes as identified.

Comment: On November 4, 2013 the California State Department of Transportation (Caltrans) provided docketed comments on the PSA Part A (DOT2013a). Caltrans requested that any work conducted in or near state rights-of-way would require an encroachment permit.

Staff Response: Staff’s proposed Condition of Certfication **TRANS-4** would require the applicant to obtain an encroachment permit prior to conducting any work within any right- of- way.

Comment: Caltrans also requested that a Traffic Management Plan be submitted for their review for any impacts to state facilities.

Staff Response: Proposed Condition of Certification **TRANS-3** would require the applicant to prepare a Traffic Control Plan and submit the plan to Caltrans and all affected agencies for review and comment.

CONCLUSIONS

Staff has analyzed the proposed HBEP’s impacts to the nearby traffic and transportation system. With implementation of the proposed conditions of certification listed below, the HBEP 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 applicant to comply with applicable jurisdictions’ requirements of vehicle size and weights, vehicle licensing, truck routes and other applicable limitations. The applicant 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 applicant to restore any road, easement or right-of-way damaged by project construction.

3. Implementation of Condition of Certification **TRANS-3** would require the applicant 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 applicant obtain all necessary permits for the transport of construction-related materials during site mobilization and maintain adequate emergency access for the duration of project construction and operation.

4. Implementation of Condition of Certification **TRANS-4** would require the applicant to obtain the necessary encroachment permits from applicable jurisdictions.

5. Implementation of Condition of Certification **TRANS-5** would require the applicant to obtain the necessary permits for the transport of all hazardous waste associated with the project.

6. Implementation of Condition of Certification **TRANS-6** would require the applicant to implement all necessary obstruction marking and lighting in accordance with FAA requirements.

7. Implementation of Condition of Certification **TRANS-7** would require the applicant to advise pilots of the potential aviation hazards associated with thermal plumes and to avoid overflight of the facility below 1,740 feet.

PROPOSED CONDITIONS OF CERTIFICATION

TRANS-1 Roadway Use Permits and Regulations

The project owner shall comply with limitations imposed by the California Department of Transportation (Caltrans) and other relevant jurisdictions, including the city of Huntington Beach and county of Orange, on vehicle sizes and weights, driver licensing, and truck routes. 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 (MCRs), the project owner shall submit copies of any permits received during that reporting period to the Compliance Project Manager (CPM) in a timely manner. 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 Restoration of All Public Roads, Easements, and Rights-of-Way

The project owner shall restore all public roads, easements, and rights-of-way that have been damaged due to project-related construction activities. Restoration of significant damage which could cause hazards (such as potholes) must take place immediately after the damage has occurred. The restoration shall be completed in a timely manner to the road’s original condition in compliance with the applicable jurisdiction’s (city of Huntington Beach and county of Orange) standards.

Verification: Prior to the start of site mobilization, the project owner shall photograph or videotape all affected public roads, easements, right-of-way segment(s), and/or intersections. The project owner shall provide the photograph or videotape to the CPM and the affected local jurisdiction(s). The purpose of this notification is to request that these jurisdictions consider postponement of any planned public right-of-way repair or improvement activities in areas affected by project construction until construction is completed, and to coordinate any concurrent construction-related activities that cannot be postponed.

If damage to public roads, easements, or rights-of-way occurs during construction, the project owner shall notify the CPM and the affected local jurisdiction(s) to identify sections of public right-of-way to be repaired. At that time, the project owner shall establish a schedule for completion and approval of the repairs. Following completion of any public right-of-way repairs, the project owner shall provide to the CPM letters signed by the affected local jurisdiction(s) stating their satisfaction with the repairs.

TRANS-3 Traffic Control Plan, Heavy Hauling Plan, and Parking/Staging Plan

The project owner shall prepare and implement a Traffic Control Plan (TCP) for the HBEP's construction and operations traffic. The TCP shall address the movement of workers, vehicles, and materials, including arrival and departure schedules and designated workforce and delivery routes. The project owner shall consult with Caltrans, the city of Huntington Beach and other applicable local jurisdictions in the preparation and implementation of the Traffic Control Plan (TCP). The project owner shall submit the proposed TCP to Caltrans and applicable local jurisdictions in sufficient time for review and comment, and to the Energy Commission Compliance Project Manager (CPM) for review and approval prior to the proposed start of construction and implementation of the plan.

The Traffic Control Plan (TCP) shall include:

- Provisions for redirection of construction traffic with a flag person as necessary to ensure traffic safety and minimize interruptions to non-construction related traffic flow,
- Placement of necessary signage, lighting, and traffic control devices at the project construction site and lay-down areas;
- A heavy-haul plan addressing the transport and delivery of heavy and oversized loads requiring permits from the California Department of Transportation (Caltrans), other state or federal agencies, and/or the affected local jurisdictions including Los Angeles county, Orange county, city of Long Beach, city of Seal Beach, and city of Huntington Beach;
- Location and details of construction along affected roadways at night, where permitted;
- Temporary closure of travel lanes or disruptions to street segments and intersections during construction activities;
- Traffic diversion plans (in coordination with the city of Huntington Beach and Orange County) to ensure access during temporary lane/road closures;
- Access to residential and/or commercial property located near construction work and truck traffic routes;
- Assurance of access for emergency vehicles to the project site;
- Advance notification to residents, businesses, emergency providers, and hospitals that would be affected when roads may be partially or completely closed;
- Identification of safety procedures for exiting and entering the site access gate;
- Parking/Staging Plan for all phases of project construction and operation to require all project-related parking to be on-site or in designated off-site parking areas.

Verification: At least 60 calendar days prior to the start of construction, the project owner shall submit the TCP to the applicable agencies for review and comment and to the CPM for review and approval. The project owner shall also provide the CPM with a copy of the transmittal letter to the agencies requesting review and comment.

At least 30 calendar days prior to the start of construction, the project owner shall provide copies of any comment letters received from the agencies, along with any changes to the proposed development plan, to the CPM for review and approval.

TRANS-4 Encroachment into Public Rights-of-Way

Prior to any ground disturbance, improvements, or obstruction of traffic within any public road, easement, or right-of-way, the project owner or its contractor(s) shall coordinate with all relevant jurisdictions, including the city of Huntington Beach, Orange county and Caltrans, to obtain all required encroachment permits and comply with all applicable regulations.

Verification: At least 10 days prior to ground disturbance **or interruption of traffic in or along any public road, easement, or right-of-way**, the project owner shall provide copies of all permit(s), relevant to the affected location(s), received from Caltrans or any other affected jurisdiction/s to the CPM. In addition, the project owner shall retain copies of the issued/approved permit(s) and supporting documentation in its compliance file for a minimum of 6 months after the start of commercial operation.

TRANS-5 Hazardous Materials

The project owner shall ensure that permits and/or licenses are secured from the California Highway Patrol, Caltrans and all other relevant jurisdictions for the transport of hazardous materials.

Verification: The project owner shall include in the MCRs copies of all permits/ licenses acquired by the project owner and/or subcontractors concerning the transport of hazardous substances during that reporting period.

TRANS-6 Obstruction Marking and Lighting

The project owner shall install blinking obstruction marking and lighting on any construction equipment that exceeds 200 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. 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 60 days prior to the presence of any construction equipment which exceeds 200 feet in height, the project owner shall submit to the CPM for approval final design plans for construction equipment depicting the required air traffic obstruction marking and lighting.

At least 60 days prior to plant operation, the project owner shall install permanent obstruction marking and lighting consistent with FAA requirements and shall inform the CPM in writing within 10 days of installation. The lighting shall be inspected and approved by the CPM (or designated inspector) within 30 days of installation.

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.

TRANS-7 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 HBEP and recommending avoidance of overflight of the project site below 1,740 feet 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 HBEP site location on the San Diego Sectional Chart with a notice to “avoid overflight below 1,740 feet AGL”.
- Request that Southern California TRACON submit aerodrome remarks describing the location of the HBEP plant and advising against direct overflight below 1,740 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.

REFERENCES

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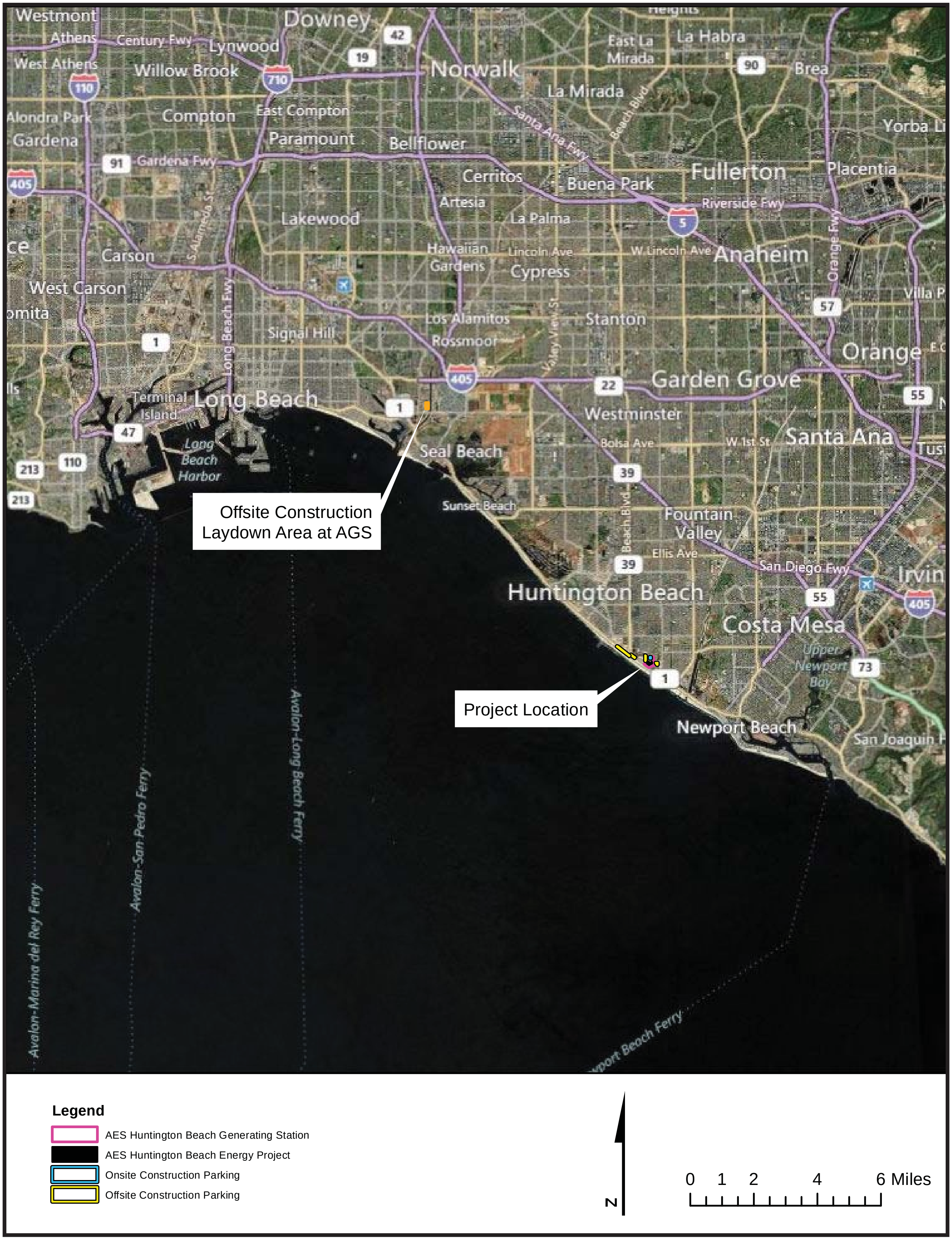
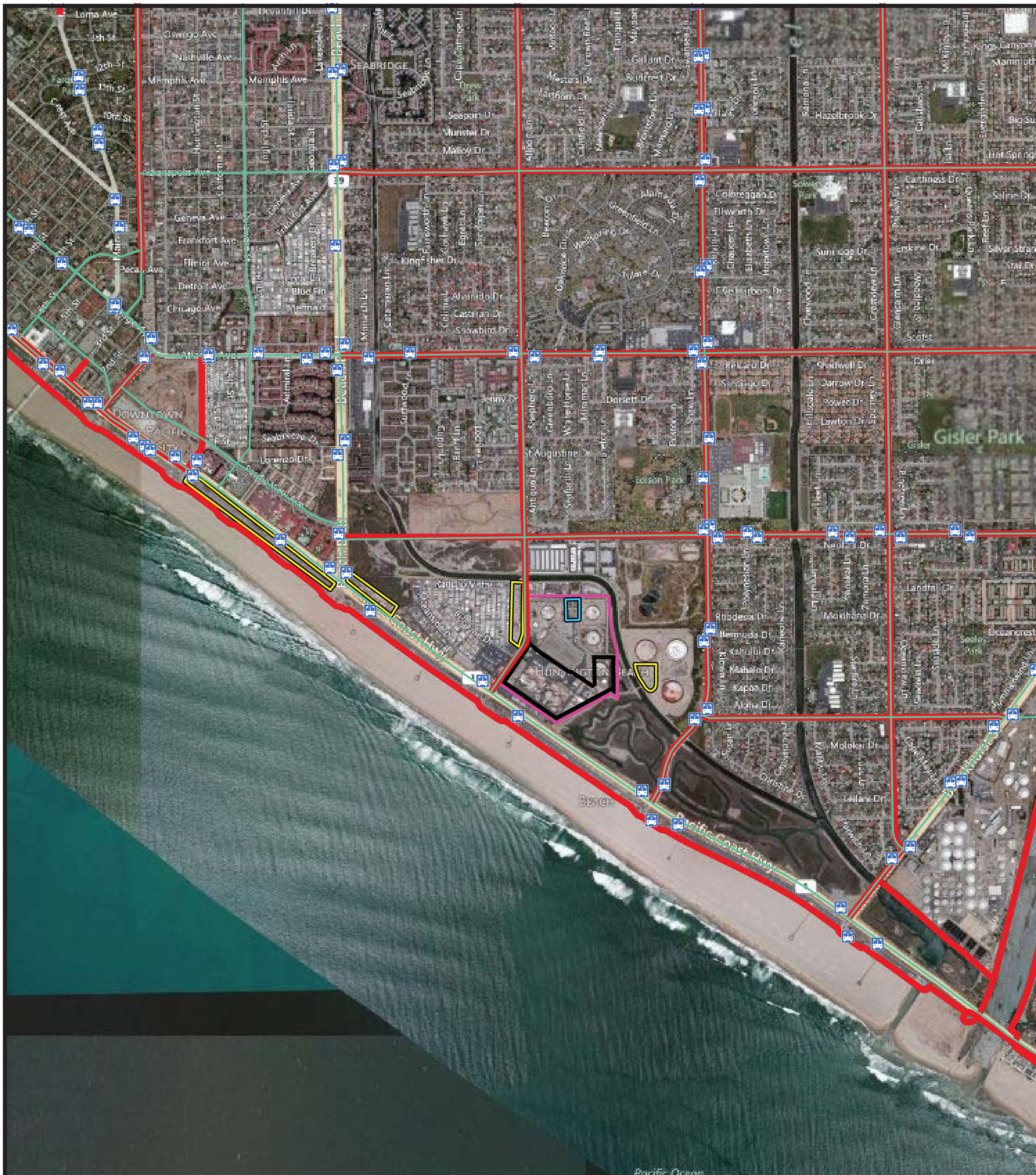
TRAFFIC AND TRANSPORTATION - FIGURE 1
Huntington Beach Energy Project- Regional Transportation Setting



CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION
SOURCE: AFC - Figure 5.12 - 1

TRAFFIC AND TRANSPORTATION - FIGURE 2
Huntington Beach Energy Project- Local Transportation Setting



Legend

- Bus Routes
- Master Plan of Arterial Highways
- Bike Routes
- AES Huntington Beach Generating Station
- AES Huntington Beach Energy Project
- Onsite Construction Parking
- Offsite Construction Parking

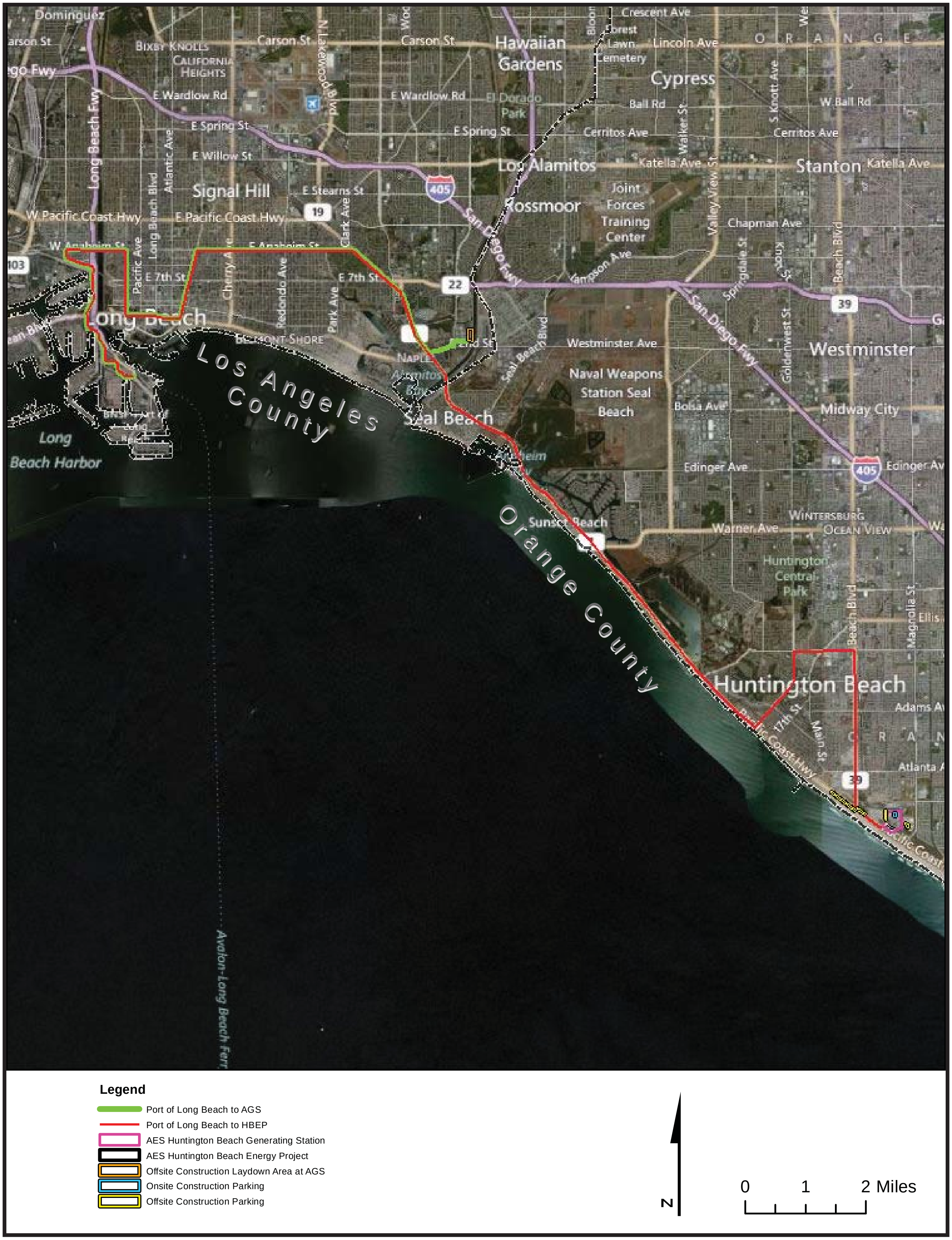
N

0 2,000 4,000 Feet

1:24,000

CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION
SOURCE: AFC - Figure 5.12 - 2

Huntington Beach Energy Project- HBEP Heavy Haul Route



CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION
SOURCE: AFC - Figure 5.12 - 3

TRAFFIC AND TRANSPORTATION - FIGURE 4

Huntington Beach Energy Project- HBEP Construction Parking Areas

CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCE: AFC - Figure 5.12 - 4

APPENDIX TT-1: PLUME VELOCITY ANALYSIS

Testimony of Tao Jiang, Ph.D., P.E.

INTRODUCTION

The following provides the assessment exhaust stack plume vertical velocities of the Huntington Beach Energy Project (HBEP) air cooled condensers (ACC) and gas turbines. Staff completed calculations to determine the worst-case vertical plume velocities at different heights above the stacks based on the applicant's proposed facility design. The purpose of this appendix is to provide documentation of the method used to estimate worst-case vertical plume velocity estimates to assist evaluation of the project's impacts on aviation safety in the vicinity of the proposed facility.

PROJECT DESCRIPTION

HBEP is a proposed 939 megawatt (MW) combined-cycle electrical generating facility, consisting of two power blocks. Each power block is composed of three Mitsubishi Power Systems Americas (MPSA) 501DA combustion turbines and a 15-cell ACC. The other plume sources at the HBEP site, like the existing fire pump diesel engines, were not consider as the plumes are very small.

PLUME VELOCITY CALCULATION METHOD

Staff uses a calculation approach from a technical paper (Best 2003) to estimate the worst-case plume vertical velocities for vertical turbulence from plumes such as the HBEP stacks and cooling system. 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 two times higher than the plume-average velocity predicted by this equation. The stack buoyancy flux (Equation 3) 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 as is the case for HBEP, the multiple stack plume velocity during calm winds is calculated by staff in a simplified fashion, presented in the Best Paper 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 for multiple plumes as given in data results presented in the Best paper (Best 2003). However, for a long linear set of plumes, such as the ACC designed for the HBEP project, it is very unlikely that all plumes can merge fully to allow this velocity given the stack separation and the height/atmospheric conditions needed for them to fully merge. Therefore the use of this approach will likely over predict the combined plume velocities in this case.

VERTICAL PLUME VELOCITY ANALYSIS

AIR COOLED CONDENSER DESIGN AND OPERATING PARAMETERS

The applicant provided exhaust data for the different ambient conditions. The design and operating parameter data for the project's ACC are provided in **Plume Velocity Table 1**.

GAS TURBINE/HRSG DESIGN AND OPERATING PARAMETERS

The applicant provided 15 different gas turbine operation scenarios. The design and operating parameter data for the gas turbines stack exhaust under these scenarios are provided in **Plume Velocity Table 2**. Staff conducted a screening analysis of all 15 cases. It was shown that Case 2 was the worst-case velocity conditions, which results in the highest height at which the plume vertical velocity drops to 4.3 m/s.

Plume Velocity Table 1
HBEP ACC Operating and Exhaust Parameters

Parameter	ACC Design Parameters		
	Block 1 ACC		
Number of Cells	15 Cells		
Cell Height (feet)	104		
Cell Stack Diameter (feet)	36		
Stack Exit Velocity (ft/sec)	11.7	13.1	12.7
Stack Temperature (°F)	86	116.5	167
Ambient Temperature (°F)	32	65.8	110
	Block 2 ACC		
Number of Cells	15 Cells		
Cell Height (feet)	104		
Cell Stack Diameter (feet)	36		
Stack Velocity (ft/sec)	11.4	17.2	16.7
Stack Temperature (°F)	86	104	155
Ambient Temperature (°F)	32	65.8	110

Source: HBEP 2013b

Plume Velocity Table 2
HBEP Gas Turbine Operating and Exhaust Parameters

Case	Ambient Temp (°F)	Stack Height (feet)	Stack Diameter (feet)	Stack Exit Vel (ft/sec)	Stack Temp (°F)
1	32	120	18	79.2	362.7
2	32	120	18	81.9	393.6
3	32	120	18	73.4	387.2
4	32	120	18	64.1	380.7
5	32	120	18	57.5	373.7
6	65.8	120	18	74.2	358
7	65.8	120	18	77.3	388.3
8	65.8	120	18	69.9	380.2
9	65.8	120	18	63.1	374
10	65.8	120	18	54.9	368
11	110	120	18	71.6	358.9
12	110	120	18	74.6	389.3
13	110	120	18	62.5	377.2
14	110	120	18	56.6	373.5
15	110	120	18	50.7	369.7

Source: HBEP 2012a, table 5.1B2

PLUME VELOCITY CALCULATION RESULTS

Using the Spillane calculation approach, the plume average vertical velocity at different heights above ground was determined by staff for calm conditions. Staff's calculated plume average velocity values for the ACC are provided in **Plume Velocity Table 3.** The combined velocities are calculated by combining all 15 cells by assuming all cell plumes have completely merged.

As explained in the **TRAFFIC AND TRANSPORTATION** section, a plume average vertical velocity of 4.3 m/s has been determined by staff to be the critical velocity of concern to light aircraft. This is based on the Australian Civil Aviation Safety Authority (CASA) advisory circular (CASA 2003). Vertical velocities below this level are not of concern to light aircraft. The air cooled condensers exhaust plumes were found to drop below 4.3 m/s at a height between 1000 and 1090 feet above ground depending on operating conditions. See **Plume Velocity Table 4**.

Plume Velocity Table 3
HBEP ACC Vertical Plume Velocities (m/s)

Height Above Ground Level (Feet)	Block 1 ACC			Block 2ACC		
	32°F	65.8°F	110°F	32°F	65.8°F	110°F
400	5.14	5.21	5.19	5.08	5.58	5.59
500	5.25	5.27	5.26	5.20	5.43	5.48
600	5.07	5.08	5.08	5.03	5.17	5.24
700	4.87	4.87	4.87	4.82	4.93	5.00
800	4.67	4.67	4.67	4.63	4.72	4.78
900	4.50	4.49	4.50	4.46	4.53	4.60
1,000	4.34	4.34	4.34	4.30	4.37	4.44
1,100	4.20	4.20	4.20	4.17	4.23	4.29
1,200	4.08	4.08	4.08	4.05	4.10	4.16
1,300	3.97	3.97	3.97	3.94	3.99	4.05
1,400	3.87	3.87	3.87	3.84	3.88	3.95
1,500	3.78	3.77	3.78	3.75	3.79	3.85
1,600	3.70	3.69	3.69	3.66	3.71	3.77
1,700	3.62	3.61	3.62	3.59	3.63	3.69
1,800	3.55	3.54	3.55	3.52	3.56	3.62
1,900	3.48	3.48	3.48	3.45	3.49	3.55
2,000	3.42	3.42	3.42	3.39	3.43	3.49

Plume Velocity Table 4
Heights of HBEP ACC Vertical Plume Velocities of 4.3m/s

	Block 1 ACC			Block 2 ACC		
	32°F	65.8°F	110°F	32°F	65.8°F	110°F
Height Above Ground Level (Feet)	1030	1025	1030	1000	1050	1090

Each power block of HBEP has 3 turbines in a linear configuration. When the spacing between the gas turbines is not large enough to prevent plume merging, the exhaust plumes may spread enough to significantly merge prior to the velocity lowering to vertical velocities below levels of concern. Therefore, the gas turbine plume size and vertical velocities for different plume merging scenarios, where the value N is equal to the number of fully merged plumes, were calculated and are presented in **Plume Velocity Table 5.**

Plume Velocity Table 5
HBEP Turbine Plume Size and Vertical Plume Velocities

Height Above Ground Level (Feet)	Plume Diameter (m) [a]	Plume Velocity (m/s) [b]		
		N=1	N=2	N=3
300	14.913	8.78	Not Merged	Not Merged
400	24.667	6.96	Not Merged	Not Merged
500	34.421	6.11	Not Merged	Not Merged
600	44.174	5.57	Not Merged	Not Merged
700	53.928	5.19	Not Merged	Not Merged
800	63.682	4.90	Not Merged	Not Merged
900	73.436	4.66	5.54	Not Merged
1000	83.189	4.47	5.31	Not Merged
1100	92.943	4.30	5.11	Not Merged
1200	102.697	4.16	4.94	Not Merged
1300	112.450	4.03	4.79	Not Merged
1400	122.204	3.92	4.66	Not Merged
1500	131.958	3.82	4.54	Not Merged
1600	141.712	3.73	4.44	Not Merged
1700	151.465	3.65	4.34	4.80
1800	161.219	3.57	4.25	4.70
1900	170.973	3.50	4.16	4.61
2000	180.726	3.44	4.09	4.52
2100	190.480	3.38	4.02	4.44
2200	200.234	3.32	3.95	4.37
2300	209.988	3.27	3.89	4.30
2400	219.741	3.22	3.83	4.24
2500	229.495	3.17	3.77	4.18
2600	239.249	3.13	3.72	4.12
2700	249.002	3.09	3.67	4.06
2800	258.756	3.05	3.63	4.01
2900	268.510	3.01	3.58	3.96
3000	278.264	2.98	3.54	3.92

Notes:
a – The separation between stacks is approximately 36.6 meters for two stacks and 73.2 meters for all stacks and the plumes will begin to merge when the plume diameter is the same as the separation and is assumed to be fully merged when the plume diameter is twice the stack separation.
b – Not Merged means not fully merged.

The values shown in **Plume Velocity Table 5** are worst-case values for Case 2 with dead calm wind conditions from ground level to the height where the plume vertical velocities reach 4.3 m/s. For other operating scenarios and ambient temperatures, the maximum heights for the 4.3 m/s vertical velocities would be somewhat lower and aircraft flying above these heights should not be affected by vertical velocities that are less than 4.3 m/s.

The gas turbine plume average velocity is calculated to drop below 4.3 m/s at a height of approximately 1,100 feet for the single turbine plume (N=1). The plume diameter at this height is around 92.9m, which is larger than the distance of two adjacent turbines (36.6m). Therefore the merging of the adjacent turbine plumes should be considered. In the case of two plumes fully merging (N=2), the average velocity is calculated to drop below 4.3 m/s at the height of 1,740 feet. The most conservative scenario assumes all three plumes would fully merge (i.e., N=3), where plume average velocity is calculated to drop below 4.3 m/s at a height of approximately 2,300 feet. However, it is very unlikely that all three plumes can merge fully to allow this velocity given the stack separation and the height/atmospheric conditions needed for them to fully merge (including dead calm wind conditions for the entire portion of the atmosphere from stack exit up to the point where the vertical velocity drops to 4.3 m/s). Therefore staff proposes, as a reasonable worst case, to use the scenario of two plume merging (N=2), which shows that the average velocity drops below 4.3 m/s at the height of 1,740 feet.

The velocity values listed above in **Plume Velocity Table 3** and **Plume Velocity Table 5** 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 STATISTICS

The operating monitoring station closest to the proposed site is Costa Mesa station, approximately 3.5 miles northeast of the project site. There are no complex terrain features between the monitoring site and the project site. Therefore, wind roses and wind frequency distribution data collected from the Costa Mesa station were considered to be representative for the project site location. The applicant provides the calm wind speed statistics for Costa Mesa from ground-level meteorological data collected for 2005 through 2007. Calm winds for the purposes of the reported monitoring station statistics are those hours with average wind speeds below 1 knot (equal to 0.5 m/s). Calm or very low wind speeds can also occur for shorter periods of time within each of the monitored average hourly conditions. However, the shortest time resolution for the available meteorological data is one hour. The annual wind rose data shows calm/low wind speed conditions averaging an hour or longer is 22.07 percent in the site area.

CONCLUSIONS

The calculated worst case calm wind condition vertical plume average velocities from the HBEP gas turbines and air cooled condensers are both predicted to exceed 4.3 m/s at heights at or above 500 feet above ground level. The air cooled condensers exhausts were found to drop below 4.3 m/s at the height of 1090 feet under worst case conditions. The average velocity of gas turbines plumes drops below 4.3 m/s at the height of 1,740 feet under the reasonable worst case and the scenario of two plumes merging (N=2). There are no other plume sources at the HBEP site.

The vertical velocity from the equipment exhaust at a given height above the stack decreases as wind speed increases. However, the plume average vertical velocities for the gas turbines and air cooled condensers will remain relatively high, and would exceed 4.3 m/s above 500 feet above ground level, during calm or very low wind speed conditions. These low wind speed conditions lasting an hour or more occur reasonably frequently at the site location. Additionally, shorter periods of dead calm winds, lasting long enough to increase the vertical plume average velocity height up to its peak height, can also occur during hours with low average wind speeds.

REFERENCES

Best 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.

HBEP 2012a – AES Southland Development, LLC / Stephen O'Kane (tn 66003). Application for Certification (AFC), Volume I & II, dated, June 27, 2012. Submitted to CEC/ Dockets on June 27, 2012.

HBEP 2013b – Stoel Rives LLP / Melissa A. Foster (tn 69208). Applicant's Responses to Staff's Data Requests, Set 2 (#73-98), dated January 22, 2013. Submitted to CEC/ Dockets on January 22, 2013.

CASA 2003 – Australian Civil Aviation Safety Authority (CASA) advisory circular AC 139-05(0) (http://www.casa.gov.au/newrules/parts/139/download/ac139-005.pdf).

TRANSMISSION LINE SAFETY AND NUISANCE

Testimony of Obed Odoemelam, Ph.D.

SUMMARY OF CONCLUSIONS

The applicant, AES Southland Development, LLC, proposes to build a new 230-kV line whose two circuits would be used to connect the proposed Huntington Beach Energy Project (HBEP) to Southern California Edison's (SCE's) 230-Kv switchyard located within the site of the existing Huntington Beach Generating Station (HBGS). The proposed line would lie entirely within the boundaries of the HBGS site and no offsite lines would be necessary. Since the proposed 230-kV line would be operated within the SCE service area, it would be designed, constructed, operated, routed, and maintained according to SCE's guidelines for line safety and field management which conform to applicable laws, ordinances, regulations and standards. The proposed lines would lie within the boundaries of an existing, operating power plant that would cease operations once HBEP construction is complete. Since this an existing power plant site and the connecting transmission lines would be short in length with no nearby residences, there would be no potential for the residential electric and magnetic field exposures which have been of some health concern in recent years. With the four proposed Conditions of Certification, any safety and nuisance impacts from construction and operation of the proposed line would be less than significant.

INTRODUCTION

The purpose of this staff analysis is to assess the transmission line design and operational plan for the proposed HBEP project to determine whether its related field and non-field impacts would constitute a significant environmental hazard in the area around the proposed route. All related health and safety laws, ordinances, regulations, and standards (LORS) are currently aimed at minimizing such hazards. Staff's analysis focuses on the following issues taking into account both the physical presence of the line and the physical interactions of its electric and magnetic fields:

- aviation safety;
- interference with radio-frequency communication;
- audible noise;
- fire hazards;
- hazardous shocks;
- nuisance shocks; and
- electric and magnetic field (EMF) exposure.

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

METHODOLOGY AND THRESHOLDS FOR DETERMINING ENVIRONMENTAL CONSEQUENCES

The LORS and practices listed in TLSN Table 1 have been established to maintain impacts below levels of potential environmental significance. Thus, if staff determines that the project would comply with applicable LORS, we would conclude that any transmission line-related safety and nuisance impacts would be less than significant. The nature of these individual impacts is discussed below together with the potential for compliance with the LORS that apply.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

Transmission Line Safety and Nuisance (TLSN) Table 1
Laws, Ordinances, Regulations, and Standards (LORS)

Applicable LORS	Description
Aviation Safety	
Federal	
Title 14, Part 77 of the Code of Federal Regulations (CFR),"Objects Affecting the Navigable Air Space"	Describes the criteria used to determine the need for a Federal Aviation Administration (FAA) "Notice of Proposed Construction or Alteration" in cases of potential obstruction hazards.
FAA Advisory Circular No. 70/7460-1G, "Proposed Construction and/or Alteration of Objects that May Affect the Navigation Space"	Addresses the need to file the "Notice of Proposed Construction or Alteration" (Form 7640) with the FAA in cases of potential for an obstruction hazard.
FAA Advisory Circular 70/7460-1G, "Obstruction Marking and Lighting"	Describes the FAA standards for marking and lighting objects that may pose a navigation hazard as established using the criteria in Title 14, Part 77 of the CFR.
Interference with Radio Frequency Communication	
Federal	
Title 47, CFR, section 15.2524, Federal Communications Commission (FCC)	Prohibits operation of devices that can interfere with radio-frequency communication.
State	
California Public Utilities Commission (CPUC) General Order 52 (GO-52)	Governs the construction and operation of power and communications lines to prevent or mitigate interference.
Audible Noise	
Local	
City of Huntington Beach General Plan.	Identifies and appraises noise problems within the community and assists the City in making land use decisions
City of Huntington Beach Municipal Code.	Establishes performance standards that noise sources should achieve at existing or planned residential or other noise-sensitive land uses.
Hazardous and Nuisance Shocks	
State	
CPUC GO-95, "Rules for Overhead Electric Line Construction"	Governs clearance requirements to prevent hazardous shocks, grounding techniques to minimize nuisance shocks, and maintenance and inspection requirements.
Title 8, California Code of Regulations (CCR) section 2700 et seq. "High Voltage Safety Orders"	Specifies requirements and minimum standards for safely installing, operating, working around, and maintaining electrical installations and equipment.
National Electrical Safety Code	Specifies grounding procedures to limit nuisance shocks. Also specifies minimum conductor ground clearances.

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

SETTING AND EXISTING CONDITIONS

The proposed project would be located on 28.6 acres in an industrial area of Huntington Beach, California at 21730 Newland Street just north of the intersection of the Pacific Coast Highway (Highway 1) and Newland Street. The proposed transmission line would be entirely within the boundary of the existing Huntington Beach Generating Station, an operating power plant that would cease operations once HBEP construction is complete. HBEP would connect to the regional electric power grid through the existing Southern California (SCE) 230-kilovolt (kV) switchyard located within the site of the existing Huntington Beach Generating Station. The proposed line would consist of the two 230-kV circuits that would connect the two HBEP power blocks to this SCE switchyard. No offsite lines are proposed as part of HBEP.

Since the proposed project’s transmission line would be located within the site of an existing power plant without nearby residents, residential exposure to the generated fields would not occur. Such residential exposure has been responsible for the health concern of recent years.

PROJECT DESCRIPTION

The proposed project line consists of the following two generator tie-lines:

- The first generator tie-line connecting HBEP’s power block 1 to the existing SCE on-site switchyard; and
- The second generator tie-line connecting HBEP’s power block 2 to the same SCE on-site switchyard.

The connector line for power block 1 would be approximately 0.22 miles while the one for power block 2 would be 0.16 miles. Each line would be designed as a combination of single-and/ or double-circle line to be supported on self-supporting steel structures. The lines' conductors would be aluminum steel-supported cables as typical of similar SCE lines. The applicant provided the details of the proposed support structures as related to line safety, maintainability, and field reduction efficiency (HBEP 2012, Figure 3.1-2).

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

DIRECT IMPACTS AND MITIGATION

Aviation Safety

For HBEP, any potential hazard to area aircraft would relate to the potential for collision in the navigable airspace. The requirements in the LORS listed on **TLSN Table 1** establish the standards for assessing the potential for obstruction hazards within the navigable space and establish the criteria for determining when to notify the FAA about such hazards. These regulations require FAA notification in cases of structures over 200 feet from the ground, or if the structure were to be less than 200 feet in height but located within the restricted airspace in the approaches to public or military airports. For airports with runways longer than 3,200 feet, the restricted space is defined by the FAA as an area extending 20,000 feet from the runway. For airports with runways of 3,200 feet or less, the restricted airspace would be an area that extends 10,000 feet from this runway. For heliports, the restricted space is an area that extends 5,000 feet.

The nearest public airport to the project site is the John Wayne Airport which is approximately 5.9 miles to the east. The nearest military airport is the Los Alamitos Army Airfield approximately10.5 miles to the north. In addition to these two airports, the applicant has provided a listing of six private or private area heliports together with their respective distances to HBEP (HBEP 2012, pp. 3-9 and 3-10). None of these airports and heliports is close enough for any line-related collision hazards. Therefore, staff does not recommend a condition of certification regarding aviation safety.

Interference with Radio-Frequency Communication

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

The HBEP line would be built and maintained according to standard practices that minimize surface irregularities and discontinuities. Moreover, the potential for such corona-related interference is usually of concern for lines of 345 kV and above, and not for 230-kV lines such as the proposed line. The proposed low-corona designs are used for SCE lines of similar voltage rating to reduce surface electric field gradients and the related potential for corona effects. Since the proposed lines would be located within an existing power plant with no nearby residents, staff does not expect any corona-related radio-frequency interference or complaints and does not recommend any related condition of certification.

Audible Noise

The noise-reducing designs related to electric field intensity are not specifically mandated by federal or state regulations in terms of specific noise limits. As with radio noise, such audible noise is limited instead through design, construction, or maintenance practices established from industry research and experience as effective without significant impacts on line safety, efficiency, maintainability, and reliability. As with radio noise, audible noise usually results from the action of the electric field at the surface of the line conductor and could be perceived as a characteristic crackling, frying, or hissing sound or hum, especially in wet weather. Since the noise level depends on the strength of the line's electric field, the potential for perception can be assessed from estimates of the field strengths expected during operation. Such noise is usually generated during rainfall, but mainly from overhead lines of 345 kV or higher. It is, therefore, not generally expected at significant levels from lines of less than 345 kV as proposed for HBEP. Research by the Electric Power Research Institute (EPRI 1982) has validated this by showing the fair-weather audible noise from modern transmission lines to be generally indistinguishable from background noise at the edge of a right-of-way of 100 feet or more. The proposed line right-of-way would fall entirely within the boundaries of an existing power plant with similar connecting lines (HBEP 2012, p. 3-9). Since the low-corona designs are also aimed at minimizing field strengths, staff does not expect the proposed line operation to add significantly to current background noise levels in the project area. For an assessment of the noise from the proposed project and related facilities, please refer to staff's analysis in the **NOISE AND VIBRATION** section.

Fire Hazards

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

The requirements of the existing SCE fire prevention and suppression program would be implemented for the proposed project line (HBEP 2012, p. 3-10). The applicant's intention to ensure compliance with the clearance-related aspects of GO-95 would be an important part of this mitigation approach. Condition of Certification **TLSN-3** is recommended to ensure compliance with these program requirements.

Hazardous Shocks

Hazardous shocks are those that could result from direct or indirect contact between an individual and the energized line, whether overhead or underground. Such shocks are capable of serious physiological harm or death and remain a driving force in the design and operation of transmission and other high-voltage lines.

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

Implement the GO-95-related measures against direct contact with the energized line (HBEP 2012, pp.3-7 through 3-10) would serve to minimize the risk of hazardous shocks. Staff's recommended Condition of Certification **TLSN-1** would be adequate to ensure implementation of the necessary mitigation measures.

Nuisance Shocks

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

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

The potential for nuisance shocks around the proposed line would be minimized through standard industry grounding practices (HBEP 2012, p. 3-9). Staff recommends Condition of Certification **TLSN-4** to ensure such grounding for HBEP.

Electric and Magnetic Field Exposure

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

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

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

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

State's Approach to Regulating Field Exposures

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

The CPUC has revisited the EMF management issue to assess the need for policy changes to reflect the available information on possible health impacts. The findings specified in Decision D.06-1-42 of January 2006, did not point to a need for significant changes to existing field management policies. Since there are no residences in the immediate vicinity of the proposed project's transmission lines, there would not be the long-term residential EMF exposures mostly responsible for the health concern of recent years. The only project-related EMF exposures of potential significance would be the short-term exposures of plant workers, regulatory inspectors, maintenance personnel, visitors, or individuals in the vicinity of the line. These types of exposures are short term and well understood as not significantly related to the health concern.

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

Since the CPUC currently requires that most new lines in California be designed to according to safety and the EMF-reducing guidelines of the electric utility in the service area involved, their fields are required under this CPUC policy to be similar to fields from similar lines in that service area. Designing the proposed project line according to existing SCE field strength-reducing guidelines would constitute compliance with the CPUC requirements for line field management.

Industry's and Applicant's Approach to Reducing Field Exposures

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

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

The field reduction measures that could be applied include the following:

1. increasing the distance between the conductors and the ground to an optimal level;
2. reducing the spacing between the conductors to an optimal level;
3. minimizing the current in the line; and
4. arranging current flow to maximize the cancellation effects from interacting of conductor fields.

Since the route of the proposed project's transmission line would have no nearby residences, the long-term residential field exposures at the root of the health concern of recent years would not be a significant concern. The field strengths of most significance in this regard would be as encountered within the boundaries of the existing Huntington Beach Generating Station. These field intensities would depend on the effectiveness of the applied field-reducing measures. The applicant calculated the maximum electric and magnetic field intensities expected when the two proposed line circuits are energized (HBEP 2012, p. 3-8). The maximum electric field strength was calculated as 0.51 kV/m directly underneath and 0.015 kV/m at the edge of the HEBP boundary while the maximum operational magnetic field strength was calculated as 32.4 mG underneath the lines and 1.0 mG at the edge of the HEBP site boundary. Staff has verified the accuracy of the modeling approach used in the applicant's calculations regarding parameters bearing on field strength dissipation and exposure assessment. These field strength values are similar to those of similar SCE lines (as required under current CPUC regulations) but, in the case of the magnetic field, the estimate is much less than the 150- 250 mG currently specified by the few states with regulatory limits. The requirements in Condition of Certification **TLSN-2** for field strength measurements are intended to assess the applicant's assumed field reduction efficiency.

CUMULATIVE IMPACTS

Operating any given project may lead to significant adverse cumulative impacts when its effects are considered cumulatively considerable. "Cumulatively considerable" means in this context that the incremental field and non-field effects of an individual project would be significant when considered together with the effects of past, existing, and future projects (California Code Regulation, Title 14, section 15130). When field intensities are measured or calculated for a specific location, they reflect the interactive, and therefore, cumulative effects of fields from all contributing conductors. This interaction could be additive or subtractive depending on prevailing conditions. For the proposed project's transmission lines, this interaction would occur between the HBEP-related fields and the fields from nearby SCE lines. Since the proposed project's transmission lines would be designed, built, and operated according to applicable field-reducing SCE guidelines (as currently required by the CPUC for effective field management), any contribution to cumulative area exposures should be at levels expected for SCE lines of similar voltage and current-carrying capacity and not considered environmentally significant in the present health risk-based regulatory scheme. The actual field strengths and contribution levels for the proposed line design would be assessed from the results of the field strength measurements specified in Condition of Certification **TLSN-2**.

COMPLIANCE WITH LORS

As previously noted, current health-risk-driven CPUC policy on EMF management requires that any high-voltage line within a given area be designed to incorporate the field strength-reducing guidelines of the main area utility lines to be interconnected. The utility in the case of HBEP is SCE. Since the proposed project's 230-kV lines would be designed according to the respective requirements of the LORS listed in **TLSN Table 1**, and operated and maintained according to current SCE guidelines on line safety and field strength management, staff considers the proposed design and operational plan to be in compliance with the health and safety requirements of concern in this analysis. The actual contribution to the area's field exposure levels would be assessed for the proposed route from results of the field strength measurements required in Condition of Certification **TLSN-2**.

RESPONSE TO AGENCY AND PUBLIC COMMENTS

To date, staff received no public or agency comments on the transmission line nuisance and safety aspects of the proposed HBEP and will reply to any such comments received in the Final Staff Assessment (FSA) document for the project.

NOTEWORTHY PUBLIC BENEFITS

Since the proposed tie-in lines would pose specific, although insignificant risks of the field and nonfield effects of concern in this analysis, their building and operation would not yield any public benefits regarding the effort to minimize any human risks from these impacts.

FACILITY CLOSURE

If the proposed HBEP were to be closed and decommissioned, and all related structures are removed as described in the **PROJECT DESCRIPTION** section, the minimal electric shocks and fire hazards from the physical presence of this tie-in line would be eliminated. Decommissioning and removal would also eliminate the transmission lines' field and non-field impacts assessed in this analysis in terms of nuisance shocks, radio-frequency impacts, audible noise, and electric and magnetic field exposure, and aviation safety. Since the lines would be designed and operated according existing SCE guidelines, these impacts would be as expected for SCE lines of the same voltage and current-carrying capacity and therefore, at levels reflecting compliance with existing health and safety LORS.

PROPOSED CONDITIONS OF CERTIFICATION

TLSN-1 The project owner shall construct the proposed 230-kV transmission line according to the requirements of California Public Utility Commission's GO-95, GO-52, GO-131-D, Title 8, and Group 2, High Voltage Electrical Safety Orders, sections 2700 through 2974 of the California Code of Regulations, and Pacific Gas and Electric's EMF reduction guidelines.

Verification: At least 30 days prior to start of construction of the transmission line or related structures and facilities, the project owner shall submit to the Compliance Project Manager (CPM) a letter signed by a California registered electrical engineer affirming that the lines will be constructed according to the requirements stated in the condition.

TLSN-2 The project owner shall use a qualified individual to measure the strengths of the electric and magnetic fields from the line at the points of maximum intensity at the edge of the right-of-way as reflected in the estimates provided by the applicant. The measurements shall be made before and 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 pre-and post-energization measurements with the CPM within 60 days after completion of the measurements.

TLSN-3 The project owner shall ensure that the route of the proposed transmission line is kept free of combustible material, as required under the provisions of section 4292 of the Public Resources Code and section 1250 of Title 14 of the California Code of Regulations.

Verification: During the first five (5) years of plant operation, the project owner shall provide a summary of inspection results and any fire prevention activities carried out along the proposed route and provide such summaries in the Annual Compliance Report on transmission line safety and nuisance-related requirements.

TLSN-4 The project owner shall ensure that all permanent metallic objects within the proposed route are grounded according to industry standards.

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

CONCLUSIONS

Since staff does not expect the proposed 230-kV transmission tie-in lines to pose an aviation hazard according to current FAA criteria, we do not consider it necessary to recommend specific location changes on the basis of a potential hazard to area aviation.

The potential for nuisance shocks would be minimized through grounding and other field-reducing measures that would be implemented in keeping with current SCE guidelines (reflecting standard industry practices). These field-reducing measures would maintain the generated fields within levels not associated with radio-frequency interference or audible noise.

The potential for hazardous shocks would be minimized through compliance with the height and clearance requirements of CPUC's General Order 95. Compliance with Title 14, California Code of Regulations, Section 1250, would minimize fire hazards while the use of low-corona line design, together with appropriate corona-minimizing construction practices, would minimize the potential for corona noise and its related interference with radio-frequency communication in the area around the route.

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

Since the proposed project’s lines would be operated to minimize the health, safety, and nuisance impacts of concern to staff and would be routed within an area with no nearby residences, staff considers the proposed design, maintenance, and construction plan as complying with the applicable LORS. With implementation of the four recommended conditions of certification, any such impacts would be less than significant along the route.

REFERENCES

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

HBEP 2012a – AES Southland Development, LLC / Stephen O'Kane (tn 66003). A*pplication for Certification (AFC), Volume I & II, dated, June 27, 2012*. Submitted to CEC/ Dockets on 06/27/2012.

National Institute of Environmental Health Services 1998. *An Assessment of the Health Effects from Exposure to Power-Line Frequency Electric and Magnetic Fields*. A

Working Group Report. August 1998.

VISUAL RESOURCES

Testimony of Jeanine Hinde

SUMMARY OF CONCLUSIONS

The existing electrical power plant site (Huntington Beach Generating Station [HBGS]) would be used for construction and operation of the proposed Huntington Beach Energy Project (HBEP). Compared to other development in the surrounding area, the HBGS and the Southern California Edison (SCE) switchyard transmission structures are the most visually prominent, built features in the project area.

The project site is in the state's Coastal Zone. Section 30251 of the California Coastal Act requires that the scenic and visual qualities of coastal areas be considered and protected as resources of public importance. Permitted development must be sited and designed to be visually compatible with the character of surrounding area, and, where feasible, to restore and enhance visual quality in visually degraded areas. The Coastal Element of the City of Huntington Beach General Plan was prepared to meet the requirements of the Coastal Act, and provides that adequate buffering and screening measures be required for any alteration of the electric generating facility on the Pacific Coast Highway. Staff therefore proposes Conditions of Certification **VIS-1** and **VIS-2** requiring preparation and implementation of plans to visually screen the project site with architectural enhancements, surface treatments, landscape plantings, and other screening measures to achieve compliance with state and local LORS.

Critical off-site viewpoints, referred to as key observation points (KOPs), were selected to represent primary viewer groups and sensitive viewing locations in a defined area surrounding the project site where adverse visual impacts could occur. For the proposed HBEP, seven KOPs were evaluated by Energy Commission staff (staff). Staff has identified significant adverse visual resources impacts at KOP 4 and KOP 5, and concludes that implementation of Conditions of Certification **VIS-1** and **VIS-2** would reduce impacts at these two KOPs to less than significant.

Staff evaluated the potential effects of the long-term schedule for the proposed demolition of HBGS structures and construction of the HBEP. Staff concludes that demolition, construction, and commissioning activities would substantially degrade the existing visual character and quality of the site and its surroundings. Staff proposes Condition of Certification **VIS-3** requiring preparation and implementation of a Construction Screening, Landscape Protection, and Site Restoration Plan to reduce this adverse impact to less than significant.

Staff analyzed the potential for lighting of the project site and structures during demolition, construction, commissioning, and operation to create new sources of substantial light or glare. Staff concludes that project lighting could adversely affect nighttime views in the area and that potential glint and glare impacts would be significant. Staff proposes Conditions of Certification **VIS-4**, **VIS-5**, and **VIS-6** to reduce the effects of light and glare on visual resources to less than significant.

INTRODUCTION

This section describes existing visual resources conditions in the vicinity of the proposed HBEP and evaluates potential adverse impacts on sensitive viewer groups from construction and operation of the proposed project.

Staff visited the project site in December 2012 and surveyed existing visual resources in the project area. The descriptions of visual resources in this analysis are based on staff's direct observations, proposed project materials and data prepared by the applicant and submitted to the Energy Commission, and other information and planning documents addressing visual resource conditions and issues in the project area.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

LORS pertaining to aesthetics and protection of sensitive visual resources are summarized below. Further details on applicable LORS and analyses of the proposed project's consistency with specific policies and ordinances are discussed below under "Compliance with Laws, Ordinances, Regulations, and Standards." No federal LORS pertaining to visual resources are applicable to the proposed HBEP.

STATE

California Coastal Act of 1976

The California Coastal Commission (Coastal Commission) was established by voter initiative in 1972 and later made permanent by the California State Legislature through adoption of the California Coastal Act of 1976 (Coastal Act) (Pub. Resources Code § 30000 et seq.). The Coastal Act includes policies addressing many environmental and land use management issues and defines the Coastal Zone boundary where those policies apply. Section 30001.5 of the Coastal Act includes a declaration to "protect, maintain, and where feasible, enhance and restore the overall quality of the coastal zone environment and its natural and artificial resources." Section 30251 of the Coastal Act requires that the scenic and visual qualities of coastal areas be considered and protected as resources of public importance.

Implementation of Coastal Act policies is accomplished primarily through preparation of local coastal programs (LCPs) by local municipalities that are located wholly or partly in the Coastal Zone; Huntington Beach is a shoreline community, a portion of which is in the state's Coastal Zone. Coastal Act policies are the standards by which the Coastal Commission evaluates the adequacy of an LCP. An LCP includes a land use plan (LUP), which may be the relevant portion of the local general plan, including any maps necessary to administer the plan; and zoning ordinances, zoning district maps, and other legal instruments necessary to implement the LUP (Coastal Commission 2012).

The Coastal Element of the City of Huntington Beach General Plan (General Plan) was prepared to “meet the requirements of the Coastal Act and guide civic decisions regarding growth, development, enhancement and preservation of the City’s Coastal Zone and its resources.” The Coastal Element of the General Plan was initially certified by the Coastal Commission in 2001. A comprehensive update to the Coastal Element was completed by the City in 2011 to ensure consistency with the policies and format of the 1996 General Plan (City of Huntington Beach 2011).

LOCAL

City of Huntington Beach General Plan

Applicable goals, objectives, and policies in the General Plan include those pertaining to visual and aesthetic resources in general, development in areas designated as Public, and development in the Coastal Zone. The City of Huntington Beach (City) prepared the Coastal Element of its General Plan to guide development for its portion of the Coastal Zone. The General Plan Land Use Element, Urban Design Element, Circulation Element, Utilities Element, and Environmental Resources / Conservation Element also contain goals, objectives, and policies that are potentially applicable to the proposed project.

Zoning and Subdivision Ordinance of the City of Huntington Beach

The purpose of the City’s Zoning and Subdivision Ordinance (HBZSO) is to implement the policies of the General Plan. Titles 20–25 constitute the LCP Implementation Plan, which implements the policies of the City’s certified LUP (Coastal Element) and the public access and recreation policies of the Coastal Act (HBZSO § 201.06). Titles 21, 22, 23, and 24 contain development and design standards that are applicable to preserving and enhancing public visual resources.

SETTING

PROJECT AREA CHARACTERISTICS

The project area is characterized by broad sandy beaches, low bluffs and mesas, and lowland areas. A sequence of mesas and bays provide the most notable diversity in local landforms in Huntington Beach, including the Huntington Beach Mesa. When viewed from the coast, the bluffs partially mask urban development in the northern coastal area of the county. Conversely, broad views of the Pacific Ocean coastline are possible from the bluffs of the Huntington Beach and Bolsa Chica mesas and portions of the Pacific Coast Highway (PCH).

The existing HBGS is situated on a gently sloping coastal plain with a site elevation of approximately 10 to 14 feet above mean sea level (msl). The project site is over a mile south of the southern edge of the Huntington Beach Mesa. The ridgeline of the hills beyond San Pedro to the northwest and the Santa Ana Mountains to the southeast are visible in background views from the project area. The site is entirely within the Coastal Zone.

The HBGS is in an area of existing and former energy and utility facilities and warehouse-commercial development that is surrounded to the west, north, and east by residential neighborhoods and open space and recreational uses. The closed Ascon Landfill site is northeast of the HBGS site. The area on the north side of the HBGS includes the SCE 230-kilovolt (kV) switchyard and three above-ground, decommissioned fuel oil storage tanks.

The Huntington Beach Wetlands Conservancy (Conservancy) owns and operates the Wetlands & Wildlife Care Center along the southwest side of the HBGS site; the Conservancy facilities include an interpretive and education center and a regional wildlife care facility on a slim property between the power plant site and the PCH. Starting in May 2014, regular hours of operation will begin at the interpretive center with visitors including school groups, hotel guests and others, and tours by appointment. Recent events and tours are averaging 50–100 visitors per month with the number expected to double with the start of regular operating hours at the interpretive center (Smith, pers. comm., 2014). The Conservancy manages Magnolia Marsh along the southeast border of the HBGS, which is one of four areas of wetlands making up the Huntington Beach Wetlands complex. Magnolia Marsh is designated as the Conservancy's primary area for interpretive trail use and ecotourism. Visitors to the marsh use the observation deck at the southwest corner of the marsh and a pathway along the HBGS fence line to Upper Magnolia Marsh.

The "Huntington By-The-Sea Mobile Estates and RV Park" on Newland Street borders the west side of the HBGS site between the power plant site and the PCH. Huntington State Beach and its public facilities and parking lots border the ocean side of the PCH.

PROJECT SITE CHARACTERISTICS

The existing HBGS site would be used for construction and operation of the proposed HBEP. The two HBGS 202-foot-tall boiler exhaust stacks and the generating units behind the stacks are roughly 800 feet from the beach. Compared to other development in the surrounding area, including the relatively low-profile, decommissioned fuel oil storage tanks, the HBGS and the SCE switchyard transmission structures are the most visually prominent, built features in the project area.

Parts of the existing HBGS site are landscaped with trees and shrubs based on the approved landscape plan for the 2000 Huntington Beach Generating Station Retool Project (00-AFC-13) (Energy Commission 2004). The planting plan shows landscaped areas along the northwest and southwest borders of the site. Species of trees and shrubs on the plan include Norfolk Island pine (*Araucaria heterophylla*), New Zealand Christmas tree (*Metrosideros excelsa*), maritime pine (*Pinus pinaster*), and tree mallow (*Lavatera assurgentiflora*). An 8-foot masonry wall fronted by street trees was installed along the site border on Newland Street, as depicted on the landscape plan. The landscape trees at the project site have grown tall enough to visually screen the lowest portions of some of the power plant structures for views along Newland Street, the PCH, and Huntington State Beach. The approved landscape plan shows existing groves of an ornamental evergreen shrub called myoporum (*Myoporum laetum*), which can grow to form dense stands. Myoporum shrubs are planted on the northwest, southwest, and southeast borders of the power plant site.

The main entrance to the HBGS site on Newland Street is landscaped with shrubs and flowers and small lawn areas.

The applicant describes existing lighting of the HBGS structures as substantial, including exterior lighting on the stack platforms, scaffolding on the power block exteriors, and exterior staircases (AES Southland Development 2012a). The tops of the existing exhaust stacks are lit with red aircraft safety warning beacons.

The existing HBGS generates steam to produce electricity, and the technology and operational characteristics produce visually prominent water vapor plumes from the HBGS exhaust stack for Units 1 and 2. Based on staff's site visit and review of photographs of the power plant, a large, visible plume emanates from the exhaust stack in varying weather conditions. Water vapor plumes form more frequently and are most visible during daytime hours in the winter when the sky is relatively clear. Highly visible water vapor plumes from the power plant slightly increase the industrial character and appearance of the site.

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

THRESHOLDS FOR DETERMINING SIGNIFICANCE

The California Environmental Quality Act (CEQA) provides a series of broad policy statements addressing environmental protection, including the requirement to: "Take all action necessary to provide the people of this state with clean air and water, enjoyment of *aesthetic, natural, scenic,* [emphasis added] and historic environmental qualities…" (Pub. Resources Code § 21001 (b)).

Staff uses the environmental checklist in the "Aesthetics" section of Appendix G of the California Environmental Quality Act Guidelines (State CEQA Guidelines) and professional practices for visual resource assessments to evaluate the potential effects of a project on visual resources. From the State CEQA Guidelines, an impact on visual resources is considered significant if the project would:

- have a substantial adverse effect on a scenic vista;
- substantially damage scenic resources, including but not limited to trees, rock outcroppings, and historic buildings within a state scenic highway;
- substantially degrade the existing visual character or quality of the site and its surroundings, or;
- create a new source of substantial light or glare that would adversely affect daytime or nighttime views in the area.

The section below, "Direct and Indirect Impacts and Mitigation Measures," includes a complete analysis of the proposed project's visual impacts.

Vista is sometimes defined as a distant view through or along an avenue or opening. For this visual resources analysis, scenic vista is further defined as a view that includes remarkable or memorable scenery or a view of a natural or cultural feature that is indigenous to the area. The proposed HBEP would be constructed in a mostly developed area of the Southern California coastline. Magnolia Marsh is part of a complex of restored wetland areas providing views of undeveloped open space along the southeast side of the HBEP site. Uninterrupted views of the Pacific Ocean are possible from Huntington State Beach. However, most landside views in the vicinity of the existing HBGS include built elements typical of coastal development in similar urbanized areas near the coast. No particular view in the project vicinity has a level of scenic appeal that could distinguish it as a scenic vista; therefore, no further analysis of the project relating to this criterion is necessary.

The PCH (State Route 1) borders the southwest-west side of the project site. A long segment of this highway extends north and south of the proposed HBEP site. Segments of the PCH in Ventura, Los Angeles, and Orange counties are on the list of eligible state scenic highways, as shown on the California Scenic Highway Program website (California Department of Transportation 2012). The PCH is not an officially designated state scenic highway in the region; therefore, no further analysis of the project relating to this criterion is necessary.

The General Plan designates the segment of the PCH through its planning area as a major urban scenic corridor. The Circulation Element of the General Plan includes policies on maintaining and enhancing the visual quality and scenic views along designated scenic corridors (City of Huntington Beach 2013a). The analysis below under, “Compliance with Laws, Ordinances, Regulations, and Standards,” discusses the proposed project’s consistency with applicable policies, including those addressing protection of scenic corridors and entry nodes under the City’s General Plan.

ANALYSIS METHOD

The method for this assessment of impacts on visual resources is primarily adapted from guidelines used by the U.S. Department of Transportation (USDOT), U.S. Forest Service, and the U.S. Bureau of Land Management. Federal visual resource assessment methodologies do not define what constitutes a significant adverse impact or identify thresholds for significance. The federal methodologies do provide concepts and an adaptable framework for assessing visual resources in various environments.

The analysis method to evaluate potential impacts on visual resources from construction and operation of the HBEP involved these general steps:

- Define the visual environment, or visual sphere of influence (VSOI), within which visual impacts could occur. As stated in the Application for Certification (AFC), the VSOI may be refined based on computer *viewshed* analysis and mapping.
- Describe sensitive viewpoints and the process to select key observation points, or critical viewpoints, within the VSOI for the project.
- Evaluate the potential effects of the project on visual resources based on the estimated visual sensitivity of the viewing public and the estimated viewer response to the visual change that would occur with project construction and operation.

- Evaluate whether the proposed project would comply with applicable LORS for protection of visual and aesthetic resources.

Visual Resources Appendix-1 (**Appendix VR-1**) of this staff assessment, **Visual Resources Terms, Definitions, and Analysis Method**, provides further detail on the approach and process used in this visual resources analysis.

Visual Sphere of Influence

The VSOI for the proposed HBEP takes into account the estimated visibility of its most visible structures on the project site, existing development in the area, and other variables potentially affecting visibility of the site. The highest level of visibility exists when the viewer is stationary and has direct views of the site (e.g., nearby residents). A lower level of visibility exists, for example, when the viewer is farther from the site (e.g., residents that are approximately a mile or more from the site) and/or are traveling on local roadways not immediately adjacent to the site.

The limits of the VSOI for the project generally extend to encompass the furthest distance at which potentially significant visual impacts could occur. For views of the HBEP, this distance was determined by staff to be approximately 1½ miles. At greater distances, the mass of project structures in the views would be much less dominant compared to views at closer distances.

The view from the end of the Huntington Beach Municipal Pier, with a sight line that is over 1½ miles from the project site, is a little beyond the VSOI. However, views of the coastline from the pier are unobstructed, and the pier is described as a visual asset in the Coastal Element of the City's General Plan (City of Huntington Beach 2011). Views from the pier are considered in this analysis of impacts on visual resources.

Selection and Analysis of Key Observation Points

Refinement of the visual analysis for the proposed HBEP involved identifying critical viewpoints, or key observation points (KOPs), that would most clearly show the visual effects of the proposed project. Results of the VSOI analysis and photographic survey for the HBEP resulted in selection of seven critical viewpoints to represent views from areas with relatively high levels of visual sensitivity. The selected KOPs represent viewing conditions for nearby residential areas, designated scenic roadways, and visitor and recreation areas. **Visual Resources (VR) Figure 1** shows the results of the viewshed analysis and the KOPs for the proposed project. **VR Figure 2** shows further detail for the project area. These are the seven KOPs selected for this analysis:

- **KOP 1** – View from Huntington State Beach
- **KOP 2** – View from the Huntington Beach Municipal Pier
- **KOP 3** – View from Edison Community Park
- **KOP 4** – View from Magnolia Street near the Pacific Coast Highway
- **KOP 5** – View from the Driveway Entrance to the Huntington By-The-Sea Mobile Estates and RV Park
- **KOP 6** – View from the Pacific Coast Highway near Brookhurst Street

- **KOP 7** – View from the Southern Bluff of the Huntington Beach Mesa

The visual sensitivity analysis for each representative KOP considers several variables: *visual quality, viewer concern (also referred to as viewer sensitivity), visibility, number of viewers,* and *duration of view* (see **Diagram 1** in **APPENDIX VR-1**). *Overall viewer exposure* for each KOP is generally based on an average of the values for site visibility, number of viewers, and duration of view. *Overall visual sensitivity* is generally based on an average of the values for visual quality, viewer concern, and overall viewer exposure. A key assumption of the analysis method is that low visual quality does not necessarily mean there will be no concern over the visual effects of a project (USDOT 1990). (**APPENDIX VR-2** contains an excerpt of pages referenced in this analysis from the USDOT document.) Methods to improve the visual quality of the environment (e.g., incorporating design arts into a project) deserve careful consideration simply because a project such as the HBEP is viewed frequently by many local residents and visitors to the area. **APPENDIX VR-1** defines the key terms used in this analysis.

For the proposed HBEP, staff's assessment of visual impacts involves evaluating the effects of the proposed project on visual quality for the KOPs and estimating viewer responses to the visual change. Staff's analysis also considers the degree of change that would occur from introducing new built elements in the view. The *overall visual change* is typically based on an average of the values for *contrast, dominance,* and *view blockage* for each KOP. The rating scale to assess visual sensitivity and visual change ranges from low to high for each variable. The ratings for *overall visual sensitivity* and *overall visual change* are combined to determine the visual impact for each KOP (see **Table 4** in **APPENDIX VR-1**). Finally, mitigation measures are proposed that would reduce the project's adverse visual impacts to less than significant and would also achieve compliance with applicable LORS.

Visual Sensitivity for the KOPs

KOP 1 – View from Huntington State Beach (Existing Condition)

Huntington State Beach extends 2 miles from Newport Beach and the Santa Ana River to Beach Boulevard at the south end of Huntington City Beach. KOP 1 was photographed from Huntington State Beach, across the PCH from the project site (**VR Figure 3a, existing view**). The City's demographic information states that more than 16 million people visit the beach each year.

The tops of a row of Norfolk Island pines that were planted as part of a visual screen on the southwest border of the HBGS are visible below the HBGS structures in the existing view for KOP 1. The low-profile buildings of the Wetlands & Wildlife Care Center are visible in the mid-foreground of the photograph beyond the beach (light-colored buildings with a blue roof). The palm trees in the photograph are planted near Huntington State Beach facilities on the west side of the PCH; none of the existing palm trees are part of the visual screening plan for the existing HBGS site.

The large scale of the existing HBGS structures dominates eastward views from the beach. Views at this location are otherwise characterized by much lower profile structures and palm trees adjacent to Huntington State Beach facilities. **VR Figure 4** shows a characteristic view from a parking lot adjacent to Huntington State Beach photographed by staff in December 2012. Some of the Norfolk Island pines on the southwest border of the HBGS are visible in the distance next to the power plant. A partial row of myoporum shrubs is visible on the right side of **VR Figure 4**, providing minimal visual screening between the power plant site and the adjacent wetland (Magnolia Marsh). Transmission structures at the SCE switchyard behind the HBGS are also in the view.

The existing HBGS is composed of immense, complex, mechanical structures in an area where the built environment is generally characterized by low buildings and relatively open views of the ocean and coastline and nearby residential, recreational, and tourist-oriented uses. As described in **APPENDIX VR-1** under “Visual Quality,” unity refers to the visual coherence and compositional harmony of the landscape considered as a whole. Intactness refers to the visual integrity of the natural and built landscape and its freedom from encroaching elements (USDOT 1990). There is little or no visual unity, coherence, or compositional harmony in the eastward view from KOP 1 and from other nearby viewpoints from Huntington State Beach. The HBGS is a visually discordant and encroaching built element in the view. For KOP 1, visual intactness and unity are considered low for eastward views, and overall visual quality for KOP 1 is characterized as *low*.

Viewers at KOP 1 are beachgoers engaged in passive and active recreational activities. Other viewer groups near KOP 1 include motorists on the PCH. **VR Figure 5** shows a view of the power plant for southbound motorists on the PCH near Newland Street. Viewers near KOP 1 include people walking, bicycling, and jogging on the trail that parallels the southbound lanes of the PCH. Viewer concern for visitors to Huntington State Beach and other viewpoints near KOP 1 is considered high.

Under existing conditions, the lower portions of the HBGS structures are partially screened, but given the height and bulk of the power plant structures and the relatively steep viewing angle, views of the HBGS from KOP 1 are mostly unimpeded. Visibility of the project site at this location is high.

Staff presumes that the number of recreational users per day averages well over 200 and that the number of viewers for KOP 1 is high (see **Table 1** in **APPENDIX VR-1**).

The duration of view for KOP 1 varies depending on the beach visitor’s type of activity and whether a recreational activity is active (e.g., playing beach volleyball or surfing) or passive (e.g., walking on the beach). Duration of view for KOP 1 is estimated to be high or moderate to high (see **Table 2** in **APPENDIX VR-1**).

Based on the ratings for visibility, number of viewers, and duration of view, overall viewer exposure for KOP 1 is considered high.

Due to the dominance and encroachment of the HBGS in views from KOP 1 and the lack of visual intactness and unity of elements in the view, visual quality is characterized as low. Viewer concern is characterized as high. Based on the ratings for visual quality, viewer concern, and overall viewer exposure, overall visual sensitivity for KOP 1 is considered moderate to high.

KOP 2 – View from the Huntington Beach Municipal Pier (Existing Condition)

KOP 2 was photographed from the end of the Huntington Beach Municipal Pier (**VR Figure 6a, existing view**). The pier is used by sport fishermen, pedestrians and sightseers, surfing spectators, and others. Tourist-oriented uses include a restaurant and shops. A lifeguard tower is on the pier.

The two existing 202-foot-tall boiler exhaust stacks are visible at the HBGS site in the center of the photograph, and the generating units behind the stacks appear as a massive built structure near the beach. Other than the exhaust stacks, very little structural detail can be discerned at the site. Views of the coastline from KOP 2 show the generally low-profile development and familiar palm trees in this coastal area. North of the power plant, the tile roof of the sprawling Hyatt Regency Huntington Beach is visible from KOP 2. The Waterfront Hilton Beach Resort is another prominent building in the coastal view, and it is partially visible on the left side of the photograph (**VR Figure 6a**). The scale of development up and down the coast as viewed from the pier is otherwise relatively uniform in height. The distant ridgeline of the Santa Ana Mountains is visible in the background beyond the HBGS.

VR Figure 7 was photographed by staff in December 2012 to show the visual character of Huntington Beach from a midpoint on the Huntington Beach Municipal Pier. As depicted in **VR Figure 7**, the attention of pedestrians on the pier could be drawn to the activities on the pier and the beach, which are often busy with people. The 4–5 story tile-roofed buildings in downtown Huntington Beach vary the form and line of built elements in background views from the pier. The nature and character of views from the pier vary widely depending on the time of day and the season. Although the HBGS exhaust stacks present a visually discordant feature in the coastal view, the structures are in the background and do not dominate the view from this viewpoint. Views from the pier where the ocean meets the land are somewhat intact (i.e., free of encroaching elements). Some unity (i.e., compositional harmony) is present in the landscape as a whole. The visual quality of views from KOP 2 is generally considered moderate to high.

The Huntington Beach Municipal Pier is an icon of the city and a popular tourist destination. Viewer concern for KOP 2 is assumed to be high due to the mostly recreational nature of the area.

Views toward the HBGS from KOP 2 are unobstructed and mostly unscreened; however, due to the distance between the viewpoint and the HBGS, visibility is considered moderate for KOP 2.

Because of the high number of tourists and recreationists to Huntington Beach and the many recreational opportunities in the area, the number of viewers for KOP 2 is considered high. Because pedestrians on the pier are likely to spend time casually surveying their surroundings and taking in the views, duration of view is estimated to be high.

Based on the ratings for visibility, number of viewers, and duration of view, overall viewer exposure for KOP 2 is considered moderate to high.

Visual quality is characterized as moderate to high. Viewer concern is characterized as high. Based on the ratings for visual quality, viewer concern, and overall viewer exposure, overall visual sensitivity for KOP 2 is considered moderate to high.

KOP 3 – View from Edison Community Park (Existing Condition)

KOP 3 was photographed from the children's play area at Edison Community Park, approximately one-half mile from the existing HBGS site (**VR Figure 8a, existing view**). The park covers approximately 40 acres and includes picnic and barbecue facilities; basketball, tennis, and racquetball courts; children's play equipment; paved pathways; and a community center.

The view southwest from KOP 3 is from the south half of the park looking across Hamilton Avenue, an arterial road, and away from the play and sports areas inside the park. High voltage transmission lines and towers are visible bordering Hamilton Avenue along the south side of the park. The existing HBGS is clearly visible in the distance. **VR Figure 9** was photographed by staff to show another view of Edison Community Park looking southeast from near the KOP 3 viewpoint. Near foreground views are dominated by play and recreation areas, parkland trees, and buildings in the park. The view includes the transmission towers along Hamilton Avenue and tall light standards adjacent to a sports field in the park. Vehicles on Hamilton Avenue and portions of adjacent residential areas are visible in background views. Features in the landscape include mature landscape trees on the park grounds amid built parkland structures and evidence of the urban area beyond the park boundaries. The mixture of various built elements in the view generally detracts from the visual coherence and compositional harmony of the park as a whole, and visual unity is moderate. Visual intactness is also moderate. Visual quality for KOP 3 is characterized as moderate.

Approximately 1,000 residences are within approximately one-quarter to one-half mile of the park in this community, although views of the existing HBGS from residential areas southeast and east of the site are at least partially screened visually by the earthen berm and dense row of vegetation along Magnolia Street between Hamilton Avenue and the Huntington Beach Channel. KOP 3 also represents views of the HBGS site from possible vantage points in residential areas north and west of Edison Community Park.

Viewers at KOP 3 include Huntington Beach residents and families engaged in play or sports activities at Edison Community Park. Although the view of the HBGS site is mostly unscreened, and the power plant structures are clearly visible in the background, park visitors at KOP 3 are expected to be engaged in on-site activities rather than closely observing the aesthetics of the visual environment beyond the park (see the discussion under "Duration of Views" in **APPENDIX VR-1**).

Edison Community Park is clean and well kept, and it is assumed that local residents using the park have a relatively high viewer concern due to their personal investment in the area (see the discussion under “Viewer Concern” in **APPENDIX VR-1**). Viewer concern is assumed to be high or moderate to high for KOP 3.

Views toward the HBGS from KOP 3 show the transmission line structures and the berm along Hamilton Avenue. The power plant structures are visible in the distance, and visibility of the project site is considered moderate for KOP 3.

No estimates are available for the number of visitors to Edison Community Park; however, by including nearby residents in the viewer group, the total number of viewers is estimated by staff to be moderate to high (see **Table 1** in **APPENDIX VR-1**). Residents and families using the park have opportunities to view the HBGS for extended periods of time during play and sport events, and duration of view is estimated to be moderate to high.

Based on the ratings for visibility, number of viewers, and duration of view, overall viewer exposure for KOP 3 is considered moderate to high.

Visual quality is characterized as moderate. Viewer concern is characterized as high or moderate to high. Based on the ratings for visual quality, viewer concern, and overall viewer exposure, overall visual sensitivity for KOP 3 is considered moderate to high.

KOP 4 – View from Magnolia Street near the Pacific Coast Highway (Existing Condition)

KOP 4 was photographed from Magnolia Street along the southeast border of Magnolia Marsh near the PCH (**VR Figure 10a, existing view**). Foreground views of wetland vegetation and open water contrast sharply with near middleground views of the HBGS boiler exhaust stacks and power blocks beyond the wetland. The existing power plant is approximately 1,740 feet from KOP 4, and the mechanical structures are distinctly visible at this distance.

Other views from Magnolia Street include views eastward across Brookhurst Marsh. Both marshes on either side of Magnolia Street are part of the Huntington Beach Wetlands complex that has been restored and reconnected to tidal influence; these marshes are part of the Orange Coast River Park providing open space wildlife habitat at the mouth of the Santa Ana River (California Coastal Conservancy 2011). **VR Figure 11** shows another view near KOP 4 that includes part of Brookhurst Marsh, the Huntington Beach Channel, and residences on the east side of Magnolia Street. Views toward the PCH and Huntington State Beach from KOP 4 include views of a few beach facilities and small groups of palm trees. Little variation is present in the form and line of natural and built features in the landscape for views south and southwest from KOP 4. Views of the water, soft brown and gray-green colors of the wetland vegetation, and wildlife that use the wetlands provide a respite from views of the HBGS and other nearby development; however, the power plant dominates views westward from KOP 4 and overshadows the subtle visual variety of natural elements in the marshlands. The nearby residences and concrete streetscape are encroaching elements in views of the marshes in other directions from KOP 4, and visual intactness is low to moderate. Unity of the view from KOP 4 is low to moderate. Visual quality for KOP 4 is characterized as low to moderate.

The viewpoint for KOP 4 primarily represents motorists, pedestrians, and bicyclists traveling north and south on Magnolia Street, which is part of the grid of arterial roads that interconnect the city's residential neighborhoods immediately north of the HBGS. Local residents entering and exiting the PCH at Magnolia Street have completely unobstructed foreground views of the HBGS from KOP 4. Given the proximity of KOP 4 to the PCH, this viewpoint approximately represents the foreground views for northbound motorists on this coastal highway.

Because there is no public access to Brookhurst Marsh, KOP 4 does not represent views from that part of the wetland complex. As described above under "Project Area Characteristics," public access is provided to Magnolia Marsh through the Conservancy's interpretive program, which includes an observation deck over the southwest corner of Magnolia Marsh and an interpretive trail along the fence line between the marsh and the power plant site. The Huntington Beach Wetlands are likely considered an important visual resource by the city's residents.

It is assumed that motorists, pedestrians, and bicyclists using Magnolia Street include many local residents with relatively high viewer concern for views in their community. Motorists on the PCH near KOP 4, especially those traveling through Huntington Beach for the first time, are likely to be impressed by the incongruous and intrusive presence of the HBGS in views so near the coastline. Viewer concern is assumed to be high for KOP 4.

Under existing conditions, there is essentially no visual screening of HBGS from the area of KOP 4, and views of the HBGS from KOP 4 are unimpeded. Visibility of the existing power plant at this location is high.

Magnolia Street is one of the arterial roads connecting the Huntington Beach community to the PCH; as stated in the "Traffic and Transportation" section of the AFC, traffic volumes on Magnolia Street near the HBGS average 6,000 vehicles per day. Based on this level of traffic, the number of viewers for KOP 4 is moderate to high. Traffic volumes on the PCH in the vicinity of the HBGS average from 33,000 to 42,000 vehicles per day. Because of high traffic volumes on the PCH near KOP 4, the overall number of viewers for KOP 4 is considered by staff to be high. It is assumed that the attention of motorists near the intersection of Magnolia Street at the PCH is primarily focused on traffic conditions, other motorists, bicyclists, and nearby pedestrians. Duration of view for motorists on Magnolia Street is estimated to be moderate. For pedestrians, bicyclists, and visitors to the marsh near KOP 4, duration of view increases to high. For motorists on the PCH, duration of view is estimated to be moderate to high (i.e., 1–2 minutes). The overall duration of view for KOP 4 is estimated to be moderate to high.

Based on the ratings for visibility, number of viewers, and duration of view, overall viewer exposure for KOP 4 is considered high.

Visual quality is characterized as low to moderate. Viewer concern is characterized as high. Based on the ratings for visual quality, viewer concern, and overall viewer exposure, overall visual sensitivity for KOP 4 is considered moderate to high.

KOP 5 – View from the Driveway Entrance to the Huntington By-The-Sea Mobile Estates and RV Park (Existing Condition)

KOP 5 was photographed from inside the driveway entrance to the "Huntington By-The-Sea Mobile Estates and RV Park" (mobile home park) (**VR Figure 12a, existing view**). The existing palm trees in the foreground border the entrance to the mobile home park and are not part of the visual screening plan for the existing HBGS site. Because the photographic images for KOP 5 are shown at a reduced scale (i.e., not at life-size scale), the power plant structures appear smaller in **VR Figure 12a** than they would to an observer at this viewpoint. The massive complex of structures at HBGS Units 3 and 4 are clearly visible and prominent in the foreground view from Newland Street and the area near KOP 5, although the viewpoint for KOP 5 downplays the visibility of the HBGS structures. HBGS Units 1 and 2 are visible beyond Units 3 and 4 from the area near KOP 5. The visual clutter of the piping and steel support structures of the power blocks are displayed, and no exterior structure or façade encloses the inner mechanical apparatus of the power plant.

The transmission structures at the SCE switchyard are visible behind the power plant from Newland Street near the viewpoint for KOP 5 (**VR Figure 13**). The landscape trees and other plantings across Newland Street partially screen views of the switchyard. The large decommissioned fuel oil tank north of the SCE switchyard is partially visible in the middle of the photograph in **VR Figure 13**. The viewpoint for KOP 5 is close to Huntington State Beach. Views southwest from this location show the intersection of Newland Street at the PCH and a sparse row of palm trees along the west side of Newland Street adjacent to the mobile home park. The terrain to the west appears flat at this location, and the beach and ocean are scarcely visible beyond the PCH. The visual pattern of landscape elements along the HBGS property in the near foreground softens the view of the power plant site, but the streetscape views from this location are generally unremarkable. The view southeast from KOP 5 is dominated by the massive size and distinct structural elements of the HBGS power blocks and the one exhaust stack in front of Units 3 and 4, and visual intactness is low. No visual coherence or compositional harmony is present in the view, and visual unity is low. Visual quality for KOP 5 is characterized as low.

The viewpoint for KOP 5 represents motorists, pedestrians, and local residents traveling north or south on Newland Street. Local residents and vacationers at the mobile home park have mostly unobstructed foreground views of the HBGS from KOP 5 and the area near this viewpoint. Viewer groups represented by KOP 5 are primarily expected to be local residents and recreationists, and viewer concern is assumed to be high for this KOP.

Under existing conditions, landscape visual screening elements partially screen the lowest structures at the HBGS that would otherwise be visible from KOP 5 and the mobile home park. The bulk of the HBGS structures are completely visible and unscreened above the tops of the landscape trees at the HBGS site. Views of the HBGS from KOP 5 are mostly unimpeded, and visibility of the existing power plant at this location is high.

Newland Street is one of the arterial roads connecting the Huntington Beach community to the PCH; as stated in the “Traffic and Transportation” section of the AFC, traffic volumes on Newland Street average 12,000 vehicles per day. The mobile home park includes at least 300 mobile home sites and more than 100 recreational vehicle camp sites. Based on street traffic volume and the number of residences in the mobile home park, the number of viewers for KOP 5 is high (**Table 1** in **APPENDIX VR-1**). It is assumed that the attention of motorists near the intersection of Newland Street at the PCH is primarily focused on traffic conditions, other motorists, bicyclists, and nearby pedestrians. Duration of view for motorists on Newland Street is estimated to be moderate. For pedestrians and bicyclists near KOP 5 and residents at the mobile home park, duration of view increases to high. The overall duration of view for KOP 5 is estimated to be moderate to high.

Based on the ratings for visibility, number of viewers, and duration of view, overall viewer exposure for KOP 5 is considered high.

Visual quality is characterized as low. Viewer concern is characterized as high. Based on the ratings for visual quality, viewer concern, and overall viewer exposure, overall visual sensitivity for KOP 5 is considered moderate to high.

KOP 6 – View from the Pacific Coast Highway near Brookhurst Street (Existing Condition)

KOP 6 was photographed from the shoulder next to the northbound lanes of the PCH looking north from a viewpoint immediately north of Brookhurst Street (**VR Figure 14a, existing view**). This KOP represents the view for northbound motorists on the PCH as they enter Huntington Beach. The PCH is a six-lane highway at this location, and the roadway itself commands the full attention of motorists along the highway corridor depending on the traffic flow and time of day of travel. HBGS Unit 1 and one of the exhaust stacks are clearly visible in the distant foreground from KOP 6, and they are the tallest and most prominent features in the view. The existing power plant is approximately 1 mile ahead of KOP 6 near the east side of this coastal highway, and as motorists continue north, the HBGS appears to increase in size until it dominates the field of view from the PCH near Newland Street.

A chain-link fence along the east side of the highway separates the PCH from Brookhurst Marsh, which is not open to the public. Residences beyond the marsh and the Huntington Beach Channel are partially visible on the right side of the photograph, and portions of the fuel oil storage tanks at the HBGS site are visible between the power plant structures and the residences. Stands of palm trees are visible along the highway. A small sandy berm along the left side of the photograph separates the highway from a Huntington State Beach parking lot. A wide stretch of beach is visible to the west beyond the field of view captured in the photograph for **VR Figure 14a**. The view from KOP 6 is mostly open with few structures to limit views and only slight variations in topography. Visual intactness and unity are moderate. Except for the marsh, the area near KOP 6 is fully developed. Views of the ocean from the PCH are subdued to some extent by the distractions of roadway traffic and adjacent parking lots providing easy access to the beach. Visual quality for KOP 6 is characterized as moderate.

Many travelers heading north on the PCH near KOP 6 are assumed to have initiated their travels and are destined for points outside of the Huntington Beach area. A large segment of travelers near KOP 6 is presumed to include motorists who entered the northbound lanes of the PCH from Brookhurst Street, which is a six-lane major arterial connecting the PCH in the south to Interstate 405 and Fountain Valley to the north. The characteristics and preferences of motorists near KOP 6 vary depending on the intentions of the drivers and any passengers they may carry. Some segment of travelers is assumed to be engaged in work, business, or commerce; these motorists may be primarily focused on getting from one place to another. A considerable segment of travelers are vacationers and recreationists visiting the beach or the center of Huntington Beach further north to sightsee or attend recreational events. Motorists on this coastal highway may generally have higher expectations for views along California’s coastline compared to other heavily-traveled inland highways. Viewer concern for motorists near KOP 6 is considered moderate to high or high, depending on the preferences of the viewers.

Under existing conditions, direct views of the HBGS from KOP 6 are unobstructed and unscreened. Due to the distance between the viewpoint and the HBGS, visibility is considered moderate to high for KOP 6.

In addition to the high traffic volumes on the PCH near the HBGS, traffic volumes on Brookhurst Street near its intersection with the PCH average 12,000 vehicles per day. The number of viewers for KOP 6 is considered high. For views from the PCH near Brookhurst Street, the HBGS appears near the center of the field of view for northbound motorists. Depending on traffic conditions, direct views of the power plant could continue for up to 2 minutes. The duration of view for KOP 6 is estimated to be moderate to high.

Based on the ratings for visibility, number of viewers, and duration of view, overall viewer exposure for KOP 6 is considered moderate to high.

Visual quality is characterized as moderate. Viewer concern is characterized as moderate to high or high. Based on the ratings for visual quality, viewer concern, and overall viewer exposure, overall visual sensitivity for KOP 6 is considered moderate to high.

KOP 7 – View from the Southern Bluff of the Huntington Beach Mesa (Existing Condition)

KOP 7 was photographed from Frankfort Avenue to represent views from the residential area along the southern bluff of the Huntington Beach Mesa (Figure C-17 in the Coastal Element of the General Plan shows the bluffs northwest of the project site [City of Huntington Beach 2011]). The viewpoint for KOP 7 is about 1¼ miles northwest of the existing HBGS at the entrance to the Huntington Shorecliffs Mobile Home Park (**VR Figure 15a, existing view**). The elevation increases abruptly along the mesa bluffs compared to the proposed project site; therefore, views toward the HBGS from Frankfort Avenue are generally open.

The two existing HBGS 202-foot-tall exhaust stacks and generating units are visible on the horizon beyond the tops of residences and landscape trees between the viewpoint for KOP 7 and the HBGS site. Other than the exhaust stacks, very little structural detail can be discerned at the site. A mixture of types of residences, other relatively low-profile structures, palm trees, and other landscape plantings are visible from Frankfort Avenue. Although views from KOP 7 toward the HBGS are relatively open due to the elevated viewpoint, the landscape generally shows an expanse of rooftops and stands of landscape trees and more residences in the distance. Very little visual coherence or harmony is apparent in views from KOP 7, and no particular visual element draws the viewer’s attention. Visual intactness and unity are moderate. Visual quality for KOP 7 is characterized as moderate.

The viewpoint for KOP 7 represents Huntington Beach residents, and viewer concern is assumed to be high for this KOP. Views toward the HBGS from KOP 7 are mostly unscreened; however, due to the distance between the viewpoint and the HBGS, visibility is considered low to moderate for KOP 7. Approximately 35 residences are located along the north side of Frankfort Avenue east of Delaware Street. The existing HBGS is probably visible from other residences along the bluff; therefore, the number of viewers for KOP 7 is considered moderate to high or high (**Table 1** in **APPENDIX VR-1**). Duration of view for residential viewers is estimated to be high (see the discussions under “Number of Viewers” and “Duration of Views” in **APPENDIX VR-1**).

Based on the ratings for visibility, number of viewers, and duration of view, overall viewer exposure for KOP 7 is considered moderate to high.

Visual quality is characterized as moderate. Viewer concern is characterized as high. Based on the ratings for visual quality, viewer concern, and overall viewer exposure, overall visual sensitivity for KOP 7 is considered moderate to high.

DIRECT AND INDIRECT IMPACTS AND MITIGATION MEASURES

This assessment of impacts on visual resources addresses impacts that would occur from project demolition, construction, and operation at the HBEP site. Due to the multi-year construction periods for the proposed project, impacts on visual resources from demolition and construction activities are considered to be long term rather than temporary.

Staff's analysis below under, "Visual Change for the KOPs," evaluates the visual resources impacts on sensitive viewer groups. While the proposed HBEP could slightly improve the overall visual quality at the project site even with little or no visual screening, staff has identified significant adverse impacts at two KOPs relating primarily to the increase in the overall size and mass of industrial-type project structures at the site. Staff has also identified significant adverse impacts from project demolition, construction, and operation activities and recommends appropriate mitigation measures that would reduce these impacts to less than significant, as discussed below under, "Project Demolition and Construction," and "HBEP Lighting." The proposed project's potential to comply with applicable LORS is discussed below under, "Compliance with Laws, Ordinances, Regulations, and Standards."

Major HBEP Components

The above-ground proposed project components would be located on the existing HBGS 28.6-acre site, including two 230-kV generation tie lines that would connect each power block to the existing SCE switchyard. **VR Table 1** summarizes the dimensions and quantities of the project components on the HBEP site that would likely be visible to the public from off-site locations.

Visual Resources Table 1
Visually Prominent Proposed HBEP Structures

Project Feature	Length (feet)	Width (feet)	Height (feet)	Power Block 1 (quantity)	Power Block 2 (quantity)	Elsewhere On Site (quantity)
Combustion Gas Turbine (CGT)	89	32	34	3	3	—
CGT Generator Enclosure	16	39	34	3	3	—
CGT/Heat Recovery Steam Generator (HRSG) Transition Duct	14	32	31	3	3	—
CGT Enclosure	41	32	25	3	3	—
Steam Turbine Generator Enclosure	59	55	40	1	1	—
HRSG	77	44	92	3	3	—
Stack (see note)	—	—	120	3	3	—
CGT Air Intake System	40	17	38	3	3	—
Fuel Gas Compressor Building	144	75	25	—	—	1
Air Cooled Condenser	209	127	104	1	1	—
Control / Administration Building	100	72	40	—	—	1
Maintenance / Warehouse Building	72	60	35	—	—	1
Transformer Wall	53	42	30	4	4	—
Transmission Structure	—	—	85–135	3	2	—
Transmission Dead-End Structure	—	—	75	3	3	—

Source: AES Southland Development 2012a
Note: The diameter of the stacks is approximately 18 feet.

Visual Change for the KOPs

The discussion above under, "Selection and Analysis of Key Observation Points," summarizes the process to determine impact significance. **APPENDIX VR-3** shows the KOP evaluation matrix summarizing the visual impact conclusions described below.

On April 7, 2014, the City of Huntington Beach City Council voted to adopt Resolution No. 2014-18 (TN #202084) supporting the applicant's conceptual architectural improvements to screen and enhance views of the HBEP power plant structures. The architectural improvements include three, 125-foot-tall surfboards as focal points for views from the PCH and Huntington State Beach. Visual screening includes semiopaque, decorative wave forms to partially screen views of the two power blocks. A trompe l'oeil (fool the eye) paint design is proposed for the air cooled condenser (ACC) units. The City approved the resolution with the following modifications:

- The surfboard design shall be substantially three-dimensional and of a sufficient size and proportion for a realistic representation of a surfboard.
- The trompe l'oeil painting of windows on the ACC units shall be modified to look more like a resort hotel with a treatment that more closely resembles hotel improvements.
- The HBEP structures shall be painted in a combination of tans and browns on the lower portions and light blue on the upper portions.
- No signs or other identifying features shall be painted or attached to the stacks, ACC units, or heat recovery steam generators (HRSGs).
- The final architectural plan and color scheme shall be subject to review by the City of Huntington Beach Planning and Building Department.

The City's Resolution No. 2014-18 includes the applicant's visual simulations showing the proposed architectural improvements for the views from KOP 1, KOP 4, and KOP 5. Staff's KOP analysis below considers the City's recommended architectural enhancements and includes the visual simulations to illustrate the visual change with architectural screening. Staff recommends Condition of Certification **VIS-1** requiring preparation and implementation of a Visual Screening and Enhancement Plan for Project Structures that is consistent with the architectural treatments and modifications recommended in the City's adopted Resolution No. 2014-18. The full content and review and approval requirements for **VIS-1** are provided below under the subsection, "Proposed Conditions of Certification."

KOP 1 – View from Huntington State Beach (Proposed Condition)

The visual simulation for KOP 1 shows the HBEP as it would appear at the end of demolition and construction activities for a viewer at Huntington State Beach across the PCH from the project site (**VR Figure 3b**, **simulated view**). Similar to the existing power plant, the largest and tallest structures at the project site would be clearly visible from KOP 1. Visually prominent structures at the HBEP Power Block 2 (the new structures in the left half of the photograph in place of the HBGS Units 3 and 4) would include the three HRSGs and stacks (**VR Table 1** [above] lists the dimensions of these structures). The ACC unit at HBEP Power Block 2 would be clearly visible behind the

HRSGs. The HBEP Power Block 1 would be constructed in the northeast portion of the project site (right half of the photograph) in place of the HBGS Unit 5 and the East Oil Tank. The HBGS Units 1 and 2 would be removed after the HBEP Power Blocks 1 and 2 became operational.

Although the HBGS exhaust stacks would be demolished and would not be reconstructed for the proposed project, the existing power block structures would be replaced with similarly massive, steely power plant structures. Like the existing HBGS, the HBEP would dominate eastward views from most locations along the beach in the vicinity of KOP 1. Although the HBEP Power Block 1 would be somewhat less visually dominant than the existing HBGS Units 1 and 2, new structures in the middle of the field of view would include new steel transmission monopoles and the ACC for Power Block 1.

Like the existing power plant, the forms and lines of the metal surfaces and massive geometric shapes of the new HBEP structures would dominate the landscape and contrast sharply with the relatively low-profile structures in the vicinity of KOP 1 (e.g., the buildings at the Wetlands & Wildlife Care Center). Similar to the existing HBGS, visual contrast would be high (see **Table 3** in **APPENDIX VR-1**). However, the visual effect of the HBEP would be similar to the effect of the existing HBGS for KOP 1. The degree of visual contrast created by the power plant structures at the project site compared to existing conditions is considered low to moderate. The visual simulation for KOP 1 shows the proportionate size of the HBEP structures as a whole compared to the existing HBGS structures. Like the existing power plant, the new power plant structures would dominate eastward views. The topography is relatively flat or gently sloping in the project area, and the Santa Ana Mountains are visible in the background from some vantage points. Views would continue to be closed in and limited by structures at the power plant site. As shown in the simulated view for KOP 1, the visual effect of the HBEP would create a nearly continuous horizontal band of gray, metal structures of varying heights across the field of view. Compared to existing conditions, view dominance and view blockage in the field of view are considered low.

The overall visual change is typically based on an average of the values for contrast, dominance, and view blockage. Although overall visual sensitivity for KOP 1 is considered moderate to high, the overall visual change for the proposed HBEP compared to existing conditions with construction of the project is low. From this viewpoint, demolishing the HBGS exhaust stacks and replacing the existing massive power blocks with angular, metallic power plant structures would not change visual resource conditions to any notable or significant degree. Compared to existing conditions, implementation of the HBEP with no architectural enhancements or other screening would not substantially degrade the existing visual character or quality of the site and its surroundings for views at or near KOP 1, and the impact is considered less than significant.

VR Figure 16 shows the proposed architectural enhancements at KOP 1 (TN #202084), including three, 125-foot-tall, brightly-colored surf boards angled in front of the HBEP Power Block 2. The simulated ACC unit that is partially visible behind the power block has a trompe l'oeil (fool the eye) paint treatment intended to resemble an office building. The architectural wave form and an adjoining screening wall are partially visible on the right side of the image next to Power Block 1. A uniform row of palm trees is part of the visual simulation in front of Power Block 2 (left side of the visual simulation); these palm trees are part of the applicant's proposed preliminary landscape plan submitted to the Energy Commission in November 2013 (TN #201142).

The primary visual effect of the repeated surf board design is to draw the viewer's attention to these decorative structures, partially hide views of Power Block 2, and increase the vividness of the elements in the view (see the discussion under "Visual Quality" in **Appendix VR-1**) (USDOT 1990).

KOP 2 – View from the Huntington Beach Municipal Pier (Proposed Condition)

The visual simulation for KOP 2 shows the HBEP as it would appear for a viewer at the end of the Huntington Beach Municipal Pier (**VR Figure 6b, simulated view**). From KOP 2, the proposed HBEP appears to cover a larger area compared to the existing HBGS. As shown by the visual simulation, the ACC at Power Block 2 is visible on the left side of the group of HBEP structures. Although the HBGS boiler exhaust stacks would be removed, the proposed HBEP appears as a collection of industrial-type structures in the landscape. The flat, metal surfaces and large-scale forms of the HBEP structures would contrast with other coastal development and the natural landscape. The visual effect of the HBEP would be similar to the effect of the existing HBGS for KOP 2. The 1½-mile distance to the project site from the viewpoint for KOP 2 would temper the visual contrast of the proposed power plant structures with the environment. Due to the distance between the viewpoint and the project site, the degree of visual contrast for KOP 2 is considered low to moderate (see **Table 3** in **APPENDIX VR-1)**.

The visual simulation for KOP 2 appears to show an increase in the extent and overall mass of structures at the HBEP site. However, the new structures would not completely dominate the landscape due to their distance from the viewer, and dominance of the proposed project in the field of view is considered low to moderate. Similar to the HBGS, the open views across the water and landscape toward the Santa Ana Mountains would be interrupted to a degree at this location. Compared to the existing HBGS, construction of the new power plant structures for the HBEP would create a low degree of view blockage.

For KOP 2, although overall visual sensitivity is considered moderate to high, the overall visual change for the proposed HBEP compared to existing conditions with construction of the project is low to moderate. Compared to existing conditions, implementation of the HBEP with no visual screening would not substantially degrade the existing visual character or quality of the site and its surroundings for views at or near KOP 2, and the impact is considered less than significant. Compared to views of the proposed project with no visual screening or enhancement, the City's recommended paint scheme of tans, browns, and light blue could decrease visual contrast and create an illusion that blends the HBEP structures with the environment. The shapes and colors of the three surfboards could stand out in the view.

KOP 3 – View from Edison Community Park (Proposed Condition)

The visual simulation for KOP 3 shows the HBEP as it would appear for a viewer from the south half of the park looking across Hamilton Avenue and away from the play and sports areas at this community park (**VR Figure 8b, simulated view**). The Power Block 2 HRSGs, stacks, and expansive ACC are visible on the left side of the visual simulation beyond the earthen berm along the south side of Hamilton Avenue. The Power Block 1 ACC and tops of the stacks are visible in the center of the field of view and further in the distance compared to Power Block 2. The existing transmission structures at the SCE switchyard would remain in the view for KOP 3.

The visual simulation for KOP 3 shows a change in the massing of structures at the HBEP site. However, the new structures would not dominate the landscape due to their distance from the viewer and the direction of view away from the immediate environment of the play and sports fields at the park. The degree of visual contrast and dominance of the proposed project in the field of view compared to existing conditions is considered low to moderate. Construction of the new power plant structures for the HBEP would create a low degree of view blockage.

Overall visual sensitivity for KOP 3 is considered moderate to high. The overall visual change for the proposed HBEP compared to existing conditions with construction of the project is low to moderate. Compared to existing conditions, implementation of the HBEP with no visual screening would not substantially degrade the existing visual character or quality of the site and its surroundings for views at or near KOP 3, and the impact is considered less than significant. Compared to views of the proposed project with no special paint treatment, the City's recommended color scheme for power plant surfaces could reduce the degree of visual contrast with the environment compared to views of the proposed project with no visual enhancements.

KOP 4 – View from Magnolia Street near the Pacific Coast Highway (Proposed Condition)

The visual simulation for KOP 4 shows the HBEP as it could appear for a viewer from Magnolia Street along the southeast border of Magnolia Marsh near the PCH (**VR Figure 10b, simulated view**). Under the proposed HBEP, Power Block 1 would be constructed adjacent to Magnolia Marsh at the northeast portion of the project site. The new Power Block 1 HRSGs, stacks, and ACC unit (from 92 to 120 feet tall) would replace one of the relatively low-profile decommissioned fuel oil tanks (40 feet tall) at the site, and the overall mass and bulk of power plant structures at the site would increase noticeably compared to existing conditions. To the left of center in the field of view for KOP 4, construction of the HBEP Power Block 2 would change the massing of structures to a degree compared to the existing power block structures. Removal of the HBGS exhaust stacks would be a relatively minor change in existing visual conditions given the replacement of those structures with three new stacks and HRSGs and the ACC for Power Block 2. New steel monopole transmission structures would be constructed at the project site; four tall monopoles are visible in the simulated view from KOP 4.

Similar to the existing power plant, the massive, angular forms and industrial-type structures of the proposed HBEP would contrast sharply with the natural landscape and subtle colors and textures of the marsh. The proposed HBEP would increase the mass, number, and prominence of HBEP structures in the view for KOP 4. Because Power Block 1 would be constructed at the furthest northeast portion of the project site adjacent to Magnolia Marsh (500–600 feet east of the existing power block structures), the level of visual contrast and increased dominance of power plant structures in the view would be greater for this KOP compared to existing conditions. The degree of visual contrast created by the proposed HBEP power plant structures at the project site from KOP 4 is considered moderate.

Compared to existing conditions, the new power plant structures would cause a moderate degree of view dominance from KOP 4 and other nearby viewpoints, including the PCH near Magnolia Street and the observation deck and interpretive trail in Magnolia Marsh. The largest structures at Power Block 1 would include three HRSGs and stacks, and an ACC unit (**VR Table 1**, above). Construction of the new power plant structures for the HBEP would create a low to moderate degree of view blockage compared to existing conditions.

As discussed above, the viewer groups represented by KOP 4 include local residents and visitors to Magnolia Marsh; these viewer groups are expected to have relatively high viewer concern for views in the community. Overall visual sensitivity for KOP 4 is considered moderate to high, and the overall visual change for the proposed HBEP compared to existing conditions with construction of the project is moderate. Compared to existing conditions, implementation of the HBEP with no visual screening would substantially degrade the existing visual character of the site and its surroundings for views at or near KOP 4, and the impact is considered adverse and potentially significant.

VR Figure 17 shows the proposed architectural enhancements at KOP 4 (TN #202084). The HBEP Power Block 1 structures are screened by the simulated wave form and screening wall covering the sides of the power block structures that would be prominent from this viewpoint (**VR Figure 10b**, simulated view). In **VR Figure 17**, the wave form is repeated next to Power Block 2 on the left side of the visual simulation. The City's recommended modifications include painting the power plant structures, including the ACC units, in a combination of tans and browns on the lower portions and light blue on the upper portions. The recommended paint scheme may slightly decrease the project's visual contrast with the environment. The low masonry wall visible across the middle of the visual simulation is part of the applicant's proposed preliminary landscape plan (TN #201142). Condition of Certification **VIS-1** requires the applicant to prepare and implement a Visual Screening and Enhancement Plan for Project Structures that is consistent with the architectural treatments and modifications recommended in the City's adopted Resolution No. 2014-18.

Condition of Certification **VIS-2** requires preparing and implementing a Perimeter Screening and On-site Landscape and Irrigation Plan to screen and soften views of the power plant. **VIS-2** requires the applicant to complete the project's final general arrangement/site plan to determine on-site constraints for new or replacement landscape plantings. Although the ultimate extent and location of landscape plantings is not yet known, **VIS-2** requires landscape plantings in all available on-site perimeter spaces along the northwest, southwest-west, and southeast-east project site boundaries.

The primary visual effect with the architectural enhancements (**VR Figure 17**) is to decrease the level of visual clutter and contrast from KOP 4 that is evident in the visual simulation with no architectural screening (**VR Figure 10b**, simulated view). The architectural enhancements hide the most visible industrial-type structures at the site from this viewpoint. The repeated wave form provides a unifying design element that is absent with no visual screening of power plant structures. The repeated wave form and architectural screen improves the visual quality of the environment for this viewpoint, and staff considers this a key goal to achieve for the proposed HBEP.

Staff concludes that implementation of **VIS-1** and **VIS-2** would reduce the identified adverse impact for views at or near KOP 4 to less than significant.

KOP 5 – View from the Driveway Entrance to the Huntington By-The-Sea Mobile Estates and RV Park (Proposed Condition)

As described above, the images for KOP 5 are shown at a reduced scale (i.e., not at life-size scale), and the power plant structures appear smaller than they would to an observer at this viewpoint (**VR Figure 12b, simulated view**). Print copies of **VR Figures 12a** and **12b** with an image width of about 18½ inches and held at a reading distance of approximately 12 inches would approximately represent life-size scale (TN#202348). The HBEP Power Block 2 HRSGs and stacks would be constructed close to the same location as the existing HBGS Units 3 and 4. The view from KOP 5 following construction of the HBEP would include a side view of the immense ACC (to the left of the power block in **VR Figure 12b**), which would measure 127 feet wide and stand 104 feet tall (**VR Table 1**). Prominent vertical pipes leading to the steam turbine for Power Block 2 lead over the top and down the side of the ACC unit.

The overall mass and visual prominence of HBEP structures would be much greater than what is shown in the visual simulation for KOP 5. Given the proximity of Power Block 2 structures to KOP 5, a great expanse of equipment and buildings would be unscreened and visible from viewpoints along this part of Newland Street. The level of visual contrast would be greater for this KOP compared to existing conditions. The most visible power plant structures would appear as expansive, gray metallic surfaces, emphasizing the industrial-like appearance of the HBEP as a whole. Compared to existing conditions, the level of visual contrast for KOP 5 would be moderate to high.

The proposed HBEP would increase the mass, number, and prominence of HBEP structures in the view for KOP 5 compared to existing conditions. The new power plant structures would cause a moderate to high degree of view dominance from KOP 5 and other nearby viewpoints. Construction of the new power plant structures for the HBEP would further enclose and limit the continuity of the view from KOP 5, thereby creating a moderate degree of view blockage.

As described above, viewer groups represented by KOP 5 are primarily expected to be local residents and recreationists with relatively high viewer concern. Staff's analysis of visual sensitivity presumes that viewer concern over changes at the project site would be high. In fact, it would be questionable to conclude that existing low visual quality correlates to a lack of concern over the visual effects of a project (USDOT 1990). Staff concludes that overall visual sensitivity for KOP 5 is considered moderate to high, and the overall visual change for the proposed HBEP compared to existing conditions with construction of the project is moderate to high. Staff combined these two ratings to conclude that the adverse visual impact of the HBEP at KOP 5 is significant. The analysis of visual sensitivity and visual change provides the basis for determining that with no visual screening, the HBEP would cause substantial degradation of the existing visual character of the site and its surroundings, and for views at or near KOP 5, the adverse impact is considered significant.

Condition of Certification **VIS-1** requires the applicant to prepare and implement a Visual Screening and Enhancement Plan for Project Structures that is consistent with the architectural treatments and modifications recommended in the City's adopted Resolution No. 2014-18. **VR Figure 18** shows the proposed architectural enhancements at KOP 5 (TN #202084). A print copy of **VR Figure 18** with an image width of about 18½ inches and held at a reading distance of approximately 12 inches would approximately represent life-size scale (Kanemoto, pers. comm., 2014). The side of the HBEP Power Block 2 adjacent to Newland Street is screened by the simulated wave form. The ACC unit behind the power block has a trompe l'oeil treatment to represent windows in an office structure. The proposed screening plan minimally improves visual quality at this KOP, which is the closest viewpoint to the project site. The large vertical pipes down the side of the ACC remain prominent in the view, and no design elements are provided to unify the design theme for the power plant structures for views along Newland Street.

During comments and questions offered by City Council members on April 7, Councilman Dave Sullivan stated his concerns about the view from Newland Street and commented that the proposed treatment does not disguise the project very well. Councilman Sullivan commented that something more needs to be done to improve screening of the ACC unit. Councilman Joe Carchio asked for confirmation that approval of Resolution No. 2014-18 would not prevent the City and the applicant from working through remaining issues, including final design of the architectural screening plan. This assumption was confirmed by Stephen O'Kane of AES Southland Development.

Some of the landscape trees visible in the middleground of the visual simulation are part of the applicant's proposed preliminary landscape plan (TN #201142). **VIS-2** requires preparation and implementation of a Perimeter Screening and On-site Landscape and Irrigation Plan. **VIS-2** also requires completing the project's final general arrangement/site plan to determine on-site constraints for new or replacement landscape plantings. Although the ultimate extent and location of landscape plantings on the Newland Street side of the HBEP is not yet known, **VIS-2** requires landscape plantings in all available on-site perimeter spaces along the project site boundaries.

Implementation of Condition of Certification **VIS-1** with the applicant's proposed visual screening on the Newland Street side of the project would slightly reduce the adverse impact for views at or near KOP 5; however, modifications to the plan should take into consideration the City Council's comments to improve the effectiveness of screening measures at this KOP (see the details below under "Proposed Conditions of Certification"). With implementation of **VIS 1** and **VIS-2**, the adverse impact at KOP 5 would be reduced to less than significant.

KOP 6 – View from the Pacific Coast Highway near Brookhurst Street (Proposed Condition)

The visual simulation for KOP 6 shows the HBEP as it would appear for a viewer from the shoulder next to the northbound lanes of the PCH near Brookhurst Street (**VR Figure 14b, simulated view**). The simulation of the HBEP Power Block 1 shows a row of three HRSGs and stacks that are partially obscured beyond the chain-link fence between the PCH and Brookhurst Marsh. For a motorist in an automobile or truck on the PCH near KOP 6, the viewpoint would be further from the fence and elevated slightly compared to the view for a pedestrian at KOP 6; therefore, the visibility of HBEP Power Block 1 structures would increase for a motorist compared to the view for a pedestrian at KOP 6. As motorists continue north, the HBEP power blocks would appear to increase in size until the six HRSGs and stacks and the two ACC units would dominate the view near the project site from northbound lanes of the PCH.

The visual simulation for KOP 6 shows a change in the massing of structures at the HBEP site. Although the new structures would not dominate the landscape due to their distance from the pedestrian viewer at KOP 6, the visual dominance of the power blocks and ACCs would increase for northbound motorists on the PCH. Compared to existing conditions, the degree of visual contrast and dominance of the proposed project in the field of view is considered low to moderate. With removal of the HBGS power blocks and exhaust stacks, the Waterfront Hilton Beach Resort along the east side of the PCH would be partially visible approximately 2 miles north of the viewpoint for KOP 6. Compared to existing conditions, construction of the new power plant structures for the HBEP would create a low degree of view blockage.

Overall visual sensitivity for KOP 6 is considered moderate to high. The overall visual change for the proposed HBEP compared to existing conditions with construction of the project is low to moderate. Compared to existing conditions, implementation of the HBEP with no visual screening would not substantially degrade the existing visual character or quality of the site and its surroundings for views at or near KOP 6, and the impact is considered less than significant. For northbound motorists, the architectural enhancements would draw the attention of viewers and improve visual quality for views from the vicinity of KOP 6.

KOP 7 – Views from the Southern Bluff of the Huntington Beach Mesa (Proposed Condition)

The visual simulation for KOP 7 shows the HBEP as it would appear for a viewer from the residential area along Frankfort Avenue (**VR Figure 15b, simulated view**). Similar views toward the project site from residential streets near the southern bluff of the Huntington Beach Mesa could be possible. Other viewpoints along Frankfort Avenue would be at approximately the same distance from the site as the viewpoint for KOP 7. As shown in the simulation for KOP 7, the HBEP power blocks would barely be visible beyond the roof tops and palm trees covering most of the foreground of the view. The HBEP HRSGs and stacks would not be noticeably visible behind the trees in the distance.

Removal of the HBGS exhaust stacks somewhat reduces the level of visual contrast for KOP 7; however, the approximately 1¼-mile distance to the project site from KOP 7 greatly tempers the visual contrast for either the existing HBGS or the proposed project. Compared to existing conditions, the degree of visual contrast compared to existing conditions is considered low. Similarly, visual dominance and view blockage are considered low for KOP 7.

Overall visual sensitivity for KOP 7 is considered moderate to high. The overall visual change for the proposed HBEP compared to existing conditions with construction of the project is low. Compared to existing conditions, implementation of the HBEP with no visual screening would not substantially degrade the existing visual character or quality of the site and its surroundings for views at or near KOP 7, and the impact is considered less than significant. Due to the low visibility of the project site from this viewpoint, implementation of the proposed architectural enhancements would not change the view or the visual effect to any noticeable degree.

<u>Project Demolition and Construction</u>

Construction Overview

Except for the third quarter of 2020, construction of the HBEP at the project site would include continuous work during each construction period starting at the beginning of 2015 and continuing through 2022.

The proposed project would require several areas for construction worker parking and construction laydown during site demolition and construction. Parking for workers would include an existing 3-acre open lot on Newland Street across from the project site with space for about 300 parking stalls. This open lot borders the east side of the "Huntington By-The-Sea Mobile Estates and RV Park." An open, undeveloped, 2½-acre paved lot at the southwest corner of Beach Boulevard and the PCH would provide about 215 parking stalls for construction workers. No existing visual buffering screens public views of either of these open lots, which would presumably be full of vehicles during daylight hours and sometimes at night while construction progressed on the HBEP. Other proposed construction parking areas include an existing Huntington Beach parking lot south of the PCH, a small lot at the project site, and an area at the Plains All American Tank Farm east of the project site. **VR Figure 19** delineates the construction worker parking areas for the proposed project.

A 16-acre off-site construction laydown area for storage of HBEP components would be established in an open lot next to the AES Alamitos Generating Station (AGS) in Long Beach, California. The laydown area is along the west side of a riprapped and channelized segment of the San Gabriel River that is flanked by industrial uses, including the Los Angeles Department of Water and Power's Haynes Generating Station, decommissioned fuel oil tanks, high-voltage transmission lines, and the AGS. A segment of the San Gabriel River Bike Trail borders the east side of the river through this industrial area. Westminster Boulevard crosses the San Gabriel River approximately 900–1,000 feet south of the proposed construction laydown area. Views toward the AGS and the construction laydown area from Westminster Boulevard are dominated by the AGS and the Haynes Generating Station and adjacent high-voltage power lines (see **VR Figure 20)**. Views toward the AGS from the bridge are partially screened by trees and shrubs between the construction laydown area and the bridge.

Construction-Related Effects

The intensity of the long-term construction and demolition impact on visual resources would be greatest for sensitive viewer groups (primarily residents and recreationists) at the closest viewing distances to the project site. The use and probable high visibility of heavy construction equipment and vehicles, large-scale construction and demolition work, and generation of dust over an approximately 8-year construction time frame at the project site is considered a significant adverse visual impact of the proposed project. The long-term construction time frame could impact the ground surface on or adjacent to the project site from movement of heavy equipment and temporary storage of construction materials. Existing landscaped areas and the ground surface of other areas at or near the site that would not be permanently impacted by the HBEP could be damaged or destroyed during project construction. Long-term construction impacts at the HBEP site would cause substantial degradation of the existing visual character of the site and its surroundings, and such adverse impact is considered significant.

The largest proposed construction parking area is the existing Huntington Beach parking lot south of the PCH. Because this is an existing City parking facility that is set back from the PCH, no visual impact would occur from its use during project construction. Two other parking areas, one at the project site and the other at the Plains All American Tank Farm east of the project site, would not be adjacent to public use areas, and no visual impact would occur from their use for construction parking.

Staff concludes that long-term use of the unscreened open lots for parking of hundreds of construction vehicles on Newland Street across from the project site and along the PCH at Beach Boulevard could degrade the existing visual character of adjacent areas. The primary visual effect is the introduction of what could appear to be ad hoc parking for trucks and other vehicles on undeveloped and unimproved lots over an unusually long construction period. Neither of these areas currently appears to be used for parking. Both of these parking areas are adjacent to segments of the City's designated urban scenic corridors (City of Huntington Beach 2013a).

Condition of Certification **VIS-3** is proposed to require preparation and implementation of a Construction Screening, Landscape Protection, and Site Restoration Plan to screen construction areas and provide protection for existing landscape plantings on the project site that would not be removed during project construction. **VIS-3** would require restoration of ground surfaces temporarily disturbed during project construction and demolition. Implementation of **VIS-3** would reduce construction-related adverse impacts on visual resources at the project site and the two parking areas to less than significant.

Although the purpose of screening fencing is to reduce or block views of construction sites and parking areas, the screening material could either be decorative and visually attractive or blend somewhat with the surrounding environment. **VR Figure 21a** and **21b** show examples of construction screening that could be suitable for use to screen the HBEP site and two parking areas. Types of possible screening fencing include unobtrusive designs in shades of dark green or other relatively neutral colors. Other options include mesh vinyl material printed with outdoor images (e.g., a beach and palm tree scene).

The AGS is in an area with existing and former utility uses, and use of the 16-acre open lot at the AGS site for construction laydown and equipment storage would be a relatively minor change in visual resources conditions at this location (**VR Figure 20**). Views toward the AGS from the bridge are partially screened by trees and shrubs between the construction laydown area and Westminster Boulevard, and the open lot next to the AGS is minimally visible from nearby public use areas. This change would not significantly alter the visual character or quality of the site or surrounding area, and no impact on visual resources would occur.

HBEP Lighting

Overview of Project Lighting

Project Construction

Section 5.13.2.3.5 of the AFC, "Lighting," summarizes lighting requirements for night construction and commissioning activities. Although most construction activities would occur during daytime hours, additional hours could be necessary to complete critical work (AES Southland Development 2012b). During some construction periods and the project commissioning/startup phase, work would continue 24 hours per day, 7 days per week. The AFC states that nighttime construction and commissioning lighting would be shielded and directed toward the center of the construction activity. Task-specific lighting would be used to the extent practicable and in compliance with worker safety regulations. The AFC also states that "[d]espite these measures, there may be limited times during the construction/commissioning period when the project site may appear as a brightly lit area as seen in close views and from distant hillside residential areas." In response to staff's data requests on construction lighting, the applicant states there would be no times during construction when continuous lighting of tall structures (e.g., cranes or scaffolding) would be necessary (AES Southland Development 2012a).

Project Operation

To reduce off-site lighting adverse impacts, the AFC states that exterior lights for project operation would be hooded and directed to minimize glare and light spillage beyond the project site (AES Southland Development 2012b). "Switched lighting circuits" would be provided for areas not requiring continuous illumination. In response to staff's data requests on project lighting, the applicant states that the HBEP power block equipment would "require considerably less lighting" compared to the existing power plant with lighting only required on the platforms around the tops of the six HRSGs (AES Southland Development 2012a). The applicant states that because of the more limited and highly shielded lighting of the proposed project compared to the existing plant site, illuminated areas on the project site would be smaller and more subdued compared to existing conditions.

Light and Glare Effects

Project Construction

The applicant has summarized project lighting for construction and commissioning activities, stating that some work would require round-the-clock lighting of the worksite(s). The frequency of nighttime work over the 8-year construction schedule is not known, and the applicant states that the project site could appear as a brightly lit area for limited times during project construction and commissioning. Although lighting of construction worker parking areas is not discussed in the AFC, staff assumes that security lighting of the construction parking areas shown on **VR Figure 19** would be necessary. Although the applicant states that nighttime construction lighting would be task-specific and shielded to the extent feasible, no further details are provided (e.g., a process requiring the project owner to respond to a construction-related lighting complaint). Based on the applicant's summary of construction lighting, staff concludes that long-term lighting for demolition, construction, and commissioning activities would create a new source of substantial light or glare that could adversely affect nighttime views in the area. Condition of Certification **VIS-4** proposes measures to minimize the potential adverse impacts of long-term lighting for demolition, construction, and commissioning work. Implementation of **VIS-4** would reduce long-term adverse lighting impacts to less than significant.

Project Operation

The applicant briefly described project operations lighting. As shown in **VR Table 1**, visually prominent structures would include six HRGSs and stacks and two ACCs, one for each power block. Although the applicant states that the amount of visible lighting on the site would be significantly decreased compared to current conditions, very little information is provided on project operations lighting. Operation of the HBEP Power Block 1 at the northeast corner of the project site would introduce new lighting sources where there are currently no power generating facilities. Staff concludes that permanent HBEP lighting would create a new source of substantial light or glare that could adversely affect nighttime views in the area. Condition of Certification **VIS-5** is proposed to require preparation and implementation of a comprehensive Lighting Management Plan for the HBEP.

The applicant proposes a construction schedule with a 2-year period between starting construction of the HBEP Power Block 1 (third quarter of 2016) and Power Block 2 (third quarter of 2018), with overlap planned during the last half of 2018. Given the long-term construction schedule and the potential for the Lighting Management Plan to become dated, staff proposes Condition of Certification **VIS-6** requiring preparation and submittal of a letter report on the approved Lighting Management Plan to determine whether updates to the plan are needed (e.g., to implement lighting technology changes).

Implementation of **VIS-5** and **VIS-6** would reduce potential adverse impacts of project operations lighting to less than significant.

The potential for glare from project structures to adversely affect daytime views in the project area is considered a significant impact of the HBEP. Condition of Certification **VIS-1** addresses minimizing potential visual effects of glare from project surfaces, which reduces this adverse impact to less than significant.

Visible Plumes

When a thermal power generation facility is operated at times when the ambient temperature is low and relative humidity is high, the warm moisture (water vapor) in the exhaust plume condenses as it mixes with the cooler ambient air, resulting in formation of a visible plume[1]. (This is similar to when the moisture-laden air in a person's breath on a cold day is chilled to the point where the water vapor condenses into lots of tiny droplets of liquid water, forming a visible cloudy fog.) Formation of visible plumes typically occurs on cool, humid days when the outdoor air is at or near saturation[2].

[1] Relative humidity is the percentage of the amount of water vapor in the air. The colder the air, the less water vapor it can carry.
[2] Saturated air is air containing the maximum amount of water vapor possible at a given temperature.

Section 5.13.2.3.6 of the AFC, “Water Vapor Plumes,” states that power plants like the proposed HBEP produce high velocity, high temperature exhausts that disperse quickly, thereby minimizing the probability that visible plumes would form above the stacks. Using data provided by the Applicant, Energy Commission staff conducted a preliminary assessment of the proposed project’s exhaust gas plumes. Based on the HBEP’s exhaust gas characteristics and ambient air conditions, staff concluded that conditions would be unlikely to cause formation of visible plumes above the project’s exhaust stacks. The HBEP would not include wet cooling towers with evaporative cooling. Instead, the HBEP would use dry cooling (the ACCs) for heat rejection with no possibility of forming water vapor plumes. No impact on visual resources would occur pertaining to formation of visible plumes.

Cumulative Impacts

Section 15130 of the State CEQA Guidelines requires a discussion of cumulative impacts of a project when the project’s incremental effect is cumulatively considerable. According to State CEQA Guidelines Section 15065(a)(3), “[c]umulatively 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.” Sections 15130 and 15355 of the State CEQA Guidelines both stress cumulative impacts in the context of closely related projects and from projects causing related impacts. The goal of such an analysis is twofold: first, to determine whether the overall long-term impacts of all such projects would be cumulatively significant; and second, to determine whether the HBEP itself would cause a “cumulatively considerable” (and thus significant) incremental contribution to any such cumulatively significant impacts.

For this analysis, the impacts of cumulative projects (i.e., related projects) on visual resources are limited to those that could combine with the proposed project’s visual resources impacts. The geographic scope of the area that could be subject to a cumulative visual effect is limited to the area very near the proposed HBEP. This analysis addresses the incremental effects of the HBEP combined with these projects (see **VR Figure 22**):

- Poseidon Seawater Desalination Project
- Ascon Landfill Remedial Action Plan
- Demolition of HBGS Units 3 and 4
- Demolition of the Plains All American Pipeline Tank Farm

The Poseidon Seawater Desalination Project is planned for construction immediately north of the proposed project site. The City certified the Subsequent Environmental Impact Report (SEIR) and approved the seawater desalination project in 2010. However, the coastal development permit for the project was appealed, and in November 2013, the Coastal Commission delayed a vote on the desalination project pending preparation of further studies by the project applicant. If final approval is received for the Poseidon Seawater Desalination Project, its construction schedule is unknown. Based on the project description in the SEIR, construction of the seawater desalination project would include removal of three 40-foot-tall decommissioned fuel oil storage tanks from the site and construction of multiple buildings and structures ranging from approximately 15 to 35 feet tall. The SEIR addresses implementation of design features and aesthetic techniques to improve and enhance visual resources conditions at the desalination project site. Design standards for lighting are also required to avoid creation of a new source of light or glare. Although the SEIR identifies no significant adverse impacts on visual resources for the seawater desalination project, mitigation measures are specified to ensure compliance with the City's design requirements (City of Huntington Beach 2010a).

The 38-acre closed Ascon Landfill site on Magnolia Street is within approximately 1,000 feet of Power Block 1 for the proposed HBEP. The Huntington Beach Channel separates the power plant site from the Ascon Landfill. In August 2013, the California Department of Toxic Substances Control (DTSC) released a draft EIR to evaluate the environmental impacts of the Remedial Action Plan (RAP) for the landfill. A previous DTSC study identified a preferred alternative (Alternative 4) that would generally involve partial removal of existing on-site material and installation of an engineered cap that would be topped by a vegetative soil layer (DTSC 2013), and this project is the subject of the August 2013 draft EIR.

The engineered cap over the site would be sloped upward with the southwestern portion (closest to the HBEP site) increased from its existing elevation of approximately 25 feet above msl to approximately 44 feet above msl. An internal access road would surround all sides of the site, and a chain-link security fence would be installed along the site perimeter. Earthwork and excavation under the RAP would include removal of the landfill perimeter berms along Magnolia Street and Hamilton Avenue. Removal of mature trees from the berm along Magnolia Street would also be required. No perimeter landscaping is proposed. Construction of the RAP could start in 2015 and would take approximately 1 year to complete. The proposed construction schedule for the RAP could overlap with the proposed demolition and construction of parts of the HBEP in 2015 and 2016.

DTSC's draft EIR identifies project design features to minimize impacts on aesthetic resources from implementing the RAP. Proposed project design features include sloping the site to blend the topography of the capped site with the surrounding area, vegetating the site with grasses and/or other shallow-rooted vegetation, providing ongoing weed abatement and litter control, and setting back the perimeter fence from Magnolia Street and Hamilton Avenue. With implementation of project design features, the draft EIR concludes that no significant impacts on aesthetic resources would occur from construction of the RAP. Staff concludes that implementation of the RAP would not alter the overall visual character of views in the HBEP project area to any noticeable extent.

In May 2001, the Energy Commission adopted its Decision on the Huntington Beach Generating Station Retool Project (00-AFC-13) to retool and operate the HBGS Units 3 and 4. Prior to demolition of Units 3 and 4, the project owner will submit a closure plan for staff's review and approval, which will include measures to reduce the adverse impacts of demolition on visual resources to less than significant. Because the existing HBGS Units 3 and 4 are on the HBEP project site, staff assumes that proposed conditions of certification to reduce the construction-related impacts for the HBEP would simultaneously reduce the impacts of demolishing Units 3 and 4 (see Conditions of Certification **VIS-3** and **VIS-4**, below). All adverse construction-related impacts on visual resources will be reduced to less than significant with implementation of visual screening measures during project demolition, construction, and commissioning.

In November 2012, the Huntington Beach City Council approved the mitigated negative declaration (MND) and coastal development permit for removing three empty, above-ground oil storage tanks and transfer piping from the Plains All American Pipeline property east of the HBEP site (Klemm, pers. comm., 2013). The approved project involves demolition and removal of the tank farm structures from the approximately 40-acre site with no new uses proposed for the site. Each of the three tanks is 40 feet tall and 300 feet in diameter. The MND identified no impacts on visual resources. It is estimated that demolition and grading activities could take 5–6 weeks. The schedule for this work is unknown.

A mix of development in the project area characterizes visual resources conditions. Except for the Huntington Beach Wetlands complex, the project area is mostly developed with urban land uses in a coastal setting. The existing cumulative condition for visual resources in the project area includes the HBGS, which the City identifies as a visual weakness that contributes negatively to the visual quality of the community (see the discussion below under "Compliance with Laws, Ordinances, Regulations, and Standards"). Given the location of the HBEP at the site of existing and former energy and utility facilities, and staff's conclusions (above) that overall visual sensitivity is moderate to high (see the analysis under, "Visual Sensitivity for the KOPs," above), the cumulative baseline condition for adverse visual resources impacts is considered significant. The future demolition and removal of the tank farm from the Plains All American Pipeline property will reduce the industrial appearance of the area east of the HBEP site; however, no improvements will be implemented following demolition, and the site will be left vacant and unimproved. The addition of the four cumulative projects reviewed by staff does not change the existing baseline condition for visual resources to a noticeable extent. The proposed HBEP would alter the cumulative baseline by changing the configuration and massing of power plant structures on the site. Although the use and purpose of the power plant site would not change with demolition of the HBGS and construction of the proposed project, staff considers it reasonable to conclude that construction of a highly visible power plant with no visual screening or enhancement would continue to contribute considerably to the cumulatively significant effect for visual resources. With implementation of all recommended conditions of certification, this cumulatively significant effect would be reduced to less than significant.

Summary of Project Effects

This discussion summarizes the effects of the proposed HBEP on visual resources and the corresponding thresholds from Appendix G of the State CEQA Guidelines for evaluating impacts on visual resources.

Substantial Adverse Effect on a Scenic Vista

Although uninterrupted views of the Pacific Ocean are possible from Huntington State Beach, most landside views in the vicinity of the existing HBGS include built elements typical of coastal development in urbanized areas near the coast. No particular view in the project vicinity has a level of scenic appeal that could distinguish it as a scenic vista; therefore, the proposed project would have no impact relative to this criterion.

Substantially Damage Scenic Resources, Including But Not Limited to Trees, Rock Outcroppings, and Historic Buildings within a State Scenic Highway

Because the PCH is not an officially designated state scenic highway in the region, no impact would occur relative to this criterion.

The General Plan designates the segment of the PCH through its planning area as a major urban scenic corridor. The analysis below under, "Compliance with Laws, Ordinances, Regulations, and Standards," discusses the proposed HBEP's consistency with policies addressing protection of scenic corridors under the City's General Plan.

Substantially Degrade the Existing Visual Character or Quality of the Site and its Surroundings

Staff identifies these adverse visual resources impacts relative to this criterion:

- Construction-Related Effects – The proposed HBEP would require the use of heavy construction equipment and vehicles, large-scale construction and demolition work, and generation of dust over a long-term construction schedule. This adverse visual resources impact includes the HBEP site and two of the proposed off-site construction parking areas. Long-term construction impacts would cause substantial degradation of the existing visual character of the site and its surroundings.
- KOP 4 – Overall visual sensitivity for KOP 4 is moderate to high, and the overall visual change with the proposed HBEP is moderate. Compared to existing conditions, implementation of the HBEP with no visual screening would cause a potentially significant adverse impact on visual resources and substantially degrade the existing visual character of the site and its surroundings for views at or near KOP 4.
- KOP 5 – Overall visual sensitivity for KOP 5 is moderate to high, and the overall visual change for the proposed HBEP is moderate to high. Compared to existing conditions, implementation of the HBEP with no visual screening would cause a significant adverse impact on visual resources and substantially degrade the existing visual character of the site and its surroundings for views at or near KOP 5.

Create a New Source of Substantial Light or Glare That Would Adversely Affect Daytime or Nighttimes Views in the Area

Staff identifies these adverse visual resources impacts relative to this criterion:

- Project construction lighting – The frequency of nighttime work over the long-term construction schedule is unknown; however, the project site could appear as a brightly lit area for limited times during project construction and commissioning. Staff assumes that security lighting of the construction parking areas would be necessary. Staff concludes that long-term lighting for demolition, construction, and commissioning activities would create a new source of substantial light or glare that could adversely affect nighttime views in the area.
- Project operations lighting – Although the applicant states that the amount of visible lighting on the site would be significantly decreased compared to current conditions, very little information is provided on project operations lighting. Operation of the HBEP Power Block 1 at the northeast corner of the project site would introduce new lighting sources where there are currently no power generating facilities. Staff concludes that project operations lighting would create a new source of substantial light or glare that could adversely affect nighttime views in the area.
- Potential daytime glint or glare from project structures – The potential for glint or glare from project structures to adversely affect daytime views in the project area is considered a potentially significant adverse impact of the HBEP.

RESPONSE TO AGENCY AND PUBLIC COMMENTS

Staff attended the Preliminary Staff Assessment (PSA) public workshop on November 20, 2013, to exchange comments and respond to questions on the visual resources analysis.

Written and verbal comments on the **VISUAL RESOURCES** section of the HBEP PSA Part A were submitted by the City of Huntington Beach Department of Planning and Building, the Huntington Beach Wetlands Conservancy, and Monica Rudman. Comments are summarized and staff's responses are provided below.

CITY OF HUNTINGTON BEACH

Comment

Written comments submitted by the City of Huntington Beach Department of Planning and Building on the PSA Part A include two comments on visual resources (Klemm and James, pers. comms., 2013). The first comment requests a change to the discussion of the proposed Poseidon Seawater Desalination Project on page 4.12-30 of the PSA to correctly describe it as a proposal by a private desalination company on property inside city boundaries.

The second comment requests a change to Condition of Certification **VIS-3** specifying a maximum 6-foot height for proposed construction worker parking lot screening fencing. Parking lot fencing also must meet the City's corner visibility requirements.

Response

Staff updated and corrected the discussion of the Poseidon Seawater Desalination Project for publication in the Final Staff Assessment (FSA). References to it being the City's project have been removed. Please see the revised discussion above under "Cumulative Impacts."

The changes to Condition of Certification **VIS-3** are incorporated below under, "Proposed Conditions of Certification."

Comment

At the PSA workshop, Jane James, Planning Manager of the City of Huntington Beach Planning and Building Department, commented on the importance of visually screening the project site, and in particular, the need to screen power plant structures taller than 50 feet. Ms. James commented on the need for screening the views from Newland Street, the PCH, and Huntington State Beach. Ms. James specifically referred to screening the six proposed 120-foot-tall stacks.

Response

Staff proposes Condition of Certification **VIS-1** requiring implementation of a Visual Screening and Enhancement Plan for Project Structures that is consistent with the architectural treatments and modifications recommended in Resolution No. 2014-18 adopted by the City of Huntington Beach City Council on April 7, 2014 (TN #202084). Details for **VIS-1** are provided below.

HUNTINGTON BEACH WETLANDS CONSERVANCY

Comment

Written comments submitted by the Conservancy on the PSA Part A affirmed support for construction of an 8-foot-tall solid masonry wall along the project site boundary next to the Wetlands & Wildlife Care Center. The Conservancy commented on the need to minimize potential impacts on wildlife and the visitors' interpretive center during construction and operation of the proposed HBEP (Smith, pers. comm., 2013).

The Conservancy's comment letter discusses the importance of the masonry wall as a measure to reduce noise impacts; however, because fencing, walls, and other screening devices are primarily used to reduce the potential visual effects of a project such as the HBEP, the Conservancy's comment letter is being addressed in the visual resources analysis.

Response

Staff proposes Condition of Certification **VIS-2** requiring implementation of a Perimeter Screening and On-site Landscape and Irrigation Plan, which includes construction of a solid 8-foot-tall decorative masonry wall to extend along the site boundary adjacent to the Huntington Beach Wetlands & Wildlife Care Center and parking lot and along Magnolia Marsh (i.e., the southwest-west and southeast-east boundaries). Details for **VIS-2** are provided below.

MONICA RUDMAN

Comment

Comments submitted by Monica Rudman on the PSA Part A include a comment disagreeing with staff's conclusion on whether the proposed project would have a substantial adverse effect on a scenic vista (Rudman, pers. comm., 2013). Ms. Rudman cites a statement in the May 2001 Commission Decision on the Huntington Beach Generating Station Retool Project (00-AFC-13) that describes how the "AES project does not present sufficient justification to perpetuate the vintage Huntington Beach power plant on a coastline of world-renowned scenic, recreational and environmental value." Ms. Rudman concludes that the quality of the coast has not degraded since this decision was issued.

Response

Staff agrees with Ms. Rudman's comments on the scenic value of the coastal environment. For all viewer groups identified for the KOPs in this coastal area, viewer concern is characterized as high or moderate to high. As described in the PSA Part A and this FSA, existing visual quality near the project site varies depending on the viewpoint and direction of the view. Existing visual quality for the KOPs ranges from low to moderate to high depending on the visual prominence of the HBGS in some of the views.

COMPLIANCE WITH LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

VR Table 2 (below) summarizes LORS pertaining to protection of visual and aesthetic resources. The full text for the sections, objectives, policies, and ordinances listed in the table is contained in **APPENDIX VR-4** of this staff assessment, **Applicable Laws Ordinances, Regulations, and Standards**.

In December 2012, City staff submitted a letter commenting on the AFC for the HBEP and assessing the proposed project's compliance with applicable LORS (Klemm and James, pers. comms., 2012). City staff commented that "the extremely important view of the energy facility from valuable coastal resources requires improvement" based on the many goals and policy statements in the General Plan and the City's Urban Design Guidelines.

VR Table 2 starts with Section 30251 of the California Coastal Act, which requires that the scenic and visual qualities of coastal areas be considered and protected as resources of public importance. Permitted development must be sited, and, where feasible, designed to restore and enhance visual quality in visually degraded areas. Applicable LORS listed in **VR Table 2** include several that address minimizing the visual impacts of utilities by requiring landscape and architectural buffers and screens. The Coastal Element of the City's General Plan includes a policy specifically requiring the owners of the electrical generating plant on the PCH to provide adequate buffering and screening measures for any proposal to expand or alter the existing power plant (Policy C 8.4.2 in **VR Table 2**) (City of Huntington Beach 2011). Goal C 4 of the Coastal Element addresses enhancement and restoration of the Coastal Zone, including a policy to minimize lighting levels. The Urban Design Element of the General Plan identifies the Edison Power Plant as a visual weakness that contributes negatively to the visual quality of the community (City of Huntington Beach 1996). (See applicable goals, objectives, and policies under, “Urban Design Element,” in the table below.)

Staff’s assessment of the consistency of the proposed project with the LORS listed in **VR Table 2** is made in light of the City’s adoption of Resolution No. 2014-18 supporting the applicant’s conceptual architectural improvements (TN #202084). The City approved the resolution with several modifications. Staff used the applicant’s conceptual architectural improvements from Resolution No. 2014-18 to determine the extent to which the proposed project would comply with LORS. Staff also considered the fact that the City Council expects to continue working with the project applicant to improve the effectiveness of visual screening for the project, including the view from the Newland Street side of the project.

The Coastal Act expressly authorizes the Coastal Commission to participate in the proceedings for any thermal power plant under the Energy Commission’s siting authority that is proposed in the Coastal Zone (Pub. Resources Code § 30413(d) and (e)). The Coastal Commission’s participation may include preparation and submittal of a written report to the Energy Commission specifying provisions regarding the proposed site and related facilities to meet the objectives of the Coastal Act. If the Coastal Commission prepares and submits a written report, such a report must consider conformance of the site with certified LCPs administered by jurisdictions that would be affected by any such development (Pub. Resources Code § 30413(d)(5)), and must consider “[t]he potential adverse effects that the proposed site and related facilities would have on aesthetic values” (Pub. Resources Code § 30413(d)(3)).

Visual Resources Table 2
Proposed Project Consistency with Applicable Visual Resources LORS

LORS Summary Description	Consistency Determination	Basis for Determination
California Coastal Act of 1976		
Section 30251 Scenic and visual qualities. The scenic and visual qualities of coastal areas shall be considered and protected. Permitted development shall be visually compatible with the character of the area and, where feasible, to restore and enhance visual quality in visually degraded areas.	Consistent, with implementation of **VIS-1** and **VIS-2**	Staff recommends preparation and implementation of a Visual Screening and Enhancement Plan for Project Structures (**VIS-1**) and a Perimeter Screening and On-site Landscape and Irrigation Plan (**VIS-2**). Both plans will be submitted to the Coastal Commission and the City of Huntington Beach (City), and timely comments from those agencies will be considered by the Energy Commission Compliance Project Manager (CPM) prior to plan approval.
City of Huntington Beach General Plan		
Land Use Element (City of Huntington Beach 2013b)		
Goal LU 4. Achieve and maintain high quality architecture and landscapes. **Objective LU 4.1** and **Policies 4.1.2, 4.1.3,** and **4.1.4**. Promote development of public buildings and sites that convey a high quality visual image. Prepare and submit a landscape plan for development projects subject to discretionary review.	Consistent, with implementation of **VIS-1** and **VIS-2**	Staff recommends preparation and implementation of a Visual Screening and Enhancement Plan for Project Structures (**VIS-1**) and a Perimeter Screening and On-site Landscape and Irrigation Plan (**VIS-2**). Both plans will be submitted to the Coastal Commission and the City, and timely comments from those agencies will be considered by the Energy Commission CPM prior to plan approval.
Goal LU 13. Achieve development of a mix of uses that support the needs of the City's residents. **Policy LU 13.1.8**. Ensure that public buildings, sites, and infrastructure improvements are compatible in scale, mass, character, and architecture with existing buildings and characteristics prescribed for the district in which they are located.	Refer to the analyses (below) under the goals, policies, and objectives for the Urban Design Element.	The existing HBGS is in the "Edison & Sanitation District" described in the *Urban Design Guidelines* (City of Huntington Beach 2000). Compliance with the goals, policies, and objectives listed below for the Urban Design Element would achieve consistency with the general guidelines for land uses in the district.
Urban Design Element (City of Huntington Beach 1996)		
Goal UD 1. Enhance the visual image of the City of Huntington Beach. **Policy UD 1.2.1**. Require public improvements to enhance the existing setting for all key nodes, and incorporate landscaping to mask major utilities, such as the Edison generating station.	Consistent, with implementation of **VIS-1** and **VIS-2**	Staff recommends preparation and implementation of a Visual Screening and Enhancement Plan for Project Structures (**VIS-1**) and a Perimeter Screening and On-site Landscape and Irrigation Plan (**VIS-2**). Both plans will be submitted to the Coastal Commission and the City, and timely comments from those agencies will be considered by the Energy Commission CPM prior to plan approval.
Goal UD 2. Protect and enhance public coastal views and oceanside character and screen uses that detract from the City's character. **Objective UD 2.1** and **Policy 2.1.1**. Minimize visual impacts of development on public views to the coastal corridor. Require new development be designed to consider coastal views in its massing, height, and site orientation.	Consistent, with implementation of **VIS-1** and **VIS-2**	Staff recommends preparation and implementation of a Visual Screening and Enhancement Plan for Project Structures (**VIS-1**) and a Perimeter Screening and On-site Landscape and Irrigation Plan (**VIS-2**). Both plans will be submitted to the Coastal Commission and the City, and timely comments from those agencies will be considered by the Energy Commission CPM prior to plan approval.

Visual Resources Table 2
Proposed Project Consistency with Applicable Visual Resources LORS

LORS Summary Description	Consistency Determination	Basis for Determination
Objective UD 2.2 and **Policies 2.2.1, 2.2.4,** and **2.2.5**. Minimize visual impacts of utilities where they are incompatible with surrounding uses by requiring landscape and architectural buffers and screens. Require the review of new or expanded existing utility facilities to ensure no visual impairment of coastal corridors and entry nodes.[3]		
Circulation Element (City of Huntington Beach 2013a)		
Goal CE 8. Maintain and enhance visual quality and scenic views along designated scenic corridors. **Policy 8.1**. Protect and enhance viewsheds along designated scenic corridors. *(See **VR Figure 23** of this staff assessment, which shows the City's scenic corridors and entry nodes.)* **Policy 8.7**. Require development projects adjacent to a designated scenic corridor to include landscape areas that enhance the corridor and create a buffer between the building site and the roadway. **Policy 8.11**. To the greatest extent possible, locate new and relocated utilities underground within scenic corridors. All other utility features shall be placed and screened to minimize visibility.	Consistent, with implementation of **VIS-1, VIS-2,** and **VIS-3**	Staff recommends preparation and implementation of a Visual Screening and Enhancement Plan for Project Structures (**VIS-1**) and a Perimeter Screening and On-site Landscape and Irrigation Plan (**VIS-2**). Both plans will be submitted to the Coastal Commission and the City, and timely comments from those agencies will be considered by the Energy Commission CPM prior to plan approval. **VIS-3** will contribute to achieving consistency during long-term project construction.
Utilities Element (City of Huntington Beach 2010b)		
Goal U 5. Maintain and expand service provision to City residences and businesses. **Policy U 5.1.4**. Require the review and or expansions of existing utility facilities to ensure that such facilities will not visually impair the City's coastal corridors and entry nodes.	Consistent, with implementation of **VIS-1, VIS-2,** and **VIS-3**	Staff recommends preparation and implementation of a Visual Screening and Enhancement Plan for Project Structures (**VIS-1**) and a Perimeter Screening and On-site Landscape and Irrigation Plan (**VIS-2**). Both plans will be submitted to the Coastal Commission and the City, and timely comments from those agencies will be considered by the Energy Commission CPM prior to plan approval. **VIS-3** will contribute to achieving consistency during long-term project construction.

[3] A "node" is defined as a significant focal point, such as a street intersection that acts as a center of movement and activity. The City identifies primary and secondary entry nodes; Magnolia Street and Newland Street are designated as primary and secondary entry nodes, respectively, where they intersect with the PCH.

Visual Resources Table 2
Proposed Project Consistency with Applicable Visual Resources LORS

LORS Summary Description	Consistency Determination	Basis for Determination
Environmental Resources / Conservation Element (City of Huntington Beach 2004)		
Goal ERC 4. Maintain the visual quality of the City's natural environment. **Objective ERC 4.1** and **Policy 4.1.5**. Enhance and preserve the City's aesthetic resources, including natural areas, beaches, bluffs, and significant public views.	Consistent, with implementation of **VIS-1** and **VIS-2**	Staff recommends preparation and implementation of a Visual Screening and Enhancement Plan for Project Structures (**VIS-1**) and a Perimeter Screening and On-site Landscape and Irrigation Plan (**VIS-2**). Both plans will be submitted to the Coastal Commission and the City, and timely comments from those agencies will be considered by the Energy Commission CPM prior to plan approval.
Goal ERC 5 – Conserve the natural environment and resources of the community for the long-term benefit and enjoyment of its residents and visitors. **Policy ERC 5.2.3**. Require that energy saving designs and materials be incorporated into the construction of all public buildings, and encourage their use City-wide.	Consistent, with implementation of **VIS-5** and **VIS-6**	**VIS-5** and **VIS-6** require new lighting fixtures to achieve high energy efficiency for the HBEP. **VIS-5** and **VIS-6** require the direct involvement of a certified lighting professional trained to integrate efficient technologies and designs into lighting systems.
Coastal Element (City of Huntington Beach 2011)		
Goal C 4. Preserve, enhance, and restore the aesthetic resources of the coastal zone, including natural areas, beaches, bluffs, and significant public views. **Objective C 4.1** and **Policies 4.1.1** and **4.1.4**. Scenic and visual qualities of the coastal area shall be considered and protected as resources of public importance. Development shall be sited and designed to protect public views along the ocean and scenic coastal areas. Preserve nighttime views by minimizing lighting levels along the shoreline. **Objective C 4.2** and **Policies 4.2.1, 4.2.2**, and **4.2.3**. Protect the Coastal Zone's visual resources through design review and development. Preserve public views to and from the bluffs, provide adequate landscaping, evaluate project design for visual impact and compatibility, and use landscaping to mask the electrical power plant on the PCH. Require massing, height, and orientation of new development to protect public coastal views. Promote preservation of significant public view corridors to the coastal corridor. **Objective C 4.6** and **Policy 4.6.3**. Enhance visual resources of the Coastal Zone by implementing landscape standards. For new redevelopment, require the preservation of existing mature trees or replace trees at a minimum 2:1 ratio.	Consistent, with implementation of **VIS-1, VIS-2, VIS-3, VIS-4, VIS-5,** and **VIS-6**	Staff recommends preparation and implementation of a Visual Screening and Enhancement Plan for Project Structures (**VIS-1**) and a Perimeter Screening and On-site Landscape and Irrigation Plan (**VIS-2**). Both plans will be submitted to the Coastal Commission and the City, and timely comments from those agencies will be considered by the Energy Commission CPM prior to plan approval. **VIS-3** will contribute to achieving consistency during long-term project construction. Staff recommends preparation and implementation of a Lighting Management Plan (**VIS-5**), which will be submitted to the Coastal Commission and the City for review and comment. **VIS-4** requires project lighting during demolition, construction, and commissioning to minimize potential night lighting impacts. **VIS-6** requires a full review of the approved Lighting Management Plan prior to commercial operation of Power Block 2.

Visual Resources Table 2
Proposed Project Consistency with Applicable Visual Resources LORS

LORS Summary Description	Consistency Determination	Basis for Determination
Objective C 4.7 and **Policies 4.7.1, 4.7.2, 4.7.5,** and **4.7.8**. Improve the appearance of visually degraded areas in the Coastal Zone with landscaping to screen uses that detract from scenic quality, locating utilities underground when possible, reviewing new or expanded utility facilities to avoid visual impairment of coastal corridors and entry nodes, and requiring landscaping and architectural buffers and screens around utilities.		
Goal C 8. Accommodate energy facilities and promote beneficial effects while mitigating potentially adverse impacts. **Objective C 8.4** and **Policy 8.4.2**. Encourage the owners of the electrical power plant on the PCH to buffer and screen the power plant from the PCH and Beach Boulevard with landscaping and other means. Require any power plant expansion or alteration proposals to include adequate buffering and screening measures.	Consistent, with implementation of **VIS-1** and **VIS-2**	Staff recommends preparation and implementation of a Visual Screening and Enhancement Plan for Project Structures (**VIS-1**) and a Perimeter Screening and On-site Landscape and Irrigation Plan (**VIS-2**). Both plans will be submitted to the Coastal Commission and the City, and timely comments from those agencies will be considered by the Energy Commission CPM prior to plan approval.
Huntington Beach Zoning & Subdivision Ordinance		
Title 21 – Base Districts		
Ch. 214, PS Public-Semipublic District; § 214.08 Development Standards. (N) Maximum allowable height of structures in the Coastal Zone shall be reduced to be compatible with the established physical scale of the area and to enhance public visual resources.	Consistent, with implementation of **VIS-1**	Staff recommends preparation and implementation of a Visual Screening and Enhancement Plan for Project Structures consistent with the requirements of **VIS-1**. The plan will be submitted to the Coastal Commission and the City, and timely comments from those agencies will be considered by the Energy Commission CPM prior to plan approval. The consistency determination is also based on the City's approval of Resolution No. 2014-18 (TN #202084) supporting the applicant's conceptual architectural improvements as modified and the approximately 125-foot-high structures for the project.
Title 22 – Overlay Districts		
Ch. 221, Coastal Zone Overlay District; § 221.10 Requirements for New Development Adjacent to Resource Protection Area. Development adjacent to any wetland or land zoned Coastal Conservation requires a landscape plan that prohibits planting of invasive plants, encourages low water use, and uses plants that are native to coastal Orange County. Reduce impacts of walls or barriers adjacent to conservation areas by using open fencing/wall designs, landscape screening, or other features. Walls and fences shall use designs to prevent bird strike hazards (e.g., wood, wrought iron, partially-frosted glass).	Consistent, with implementation of **VIS-2**	Staff recommends preparation and implementation of a Perimeter Screening and On-site Landscape and Irrigation Plant consistent with the requirements of **VIS-2**. The plan will be submitted to the Coastal Commission and the City, and timely comments from those agencies will be considered by the Energy Commission CPM prior to plan approval. **VIS-2** requires the project owner to request comments on proposed plant species from the Huntington Beach Wetlands Conservancy.

Visual Resources Table 2
Proposed Project Consistency with Applicable Visual Resources LORS

LORS Summary Description	Consistency Determination	Basis for Determination
Ch. 221, Coastal Zone Overlay District; § 221.14 Preservation of Visual Resources. Applicants proposing new development shall provide the Director with an evaluation of the project's visual impact. Preservation of public views is required, including views to and from the bluffs, to the shoreline and ocean, and to the wetlands. Preservation of existing mature trees is required to the maximum extent feasible.	Consistency with the requirement to evaluate the visual effects of the proposed project is achieved with preparation of this analysis. Consistency with the requirement to preserve visual resources is achieved with implementation of **VIS-1** and **VIS-2**.	Staff recommends preparation and implementation of a Visual Screening and Enhancement Plan for Project Structures (**VIS-1**) and a Perimeter Screening and On-site Landscape and Irrigation Plan (**VIS-2**). Both plans will be submitted to the Coastal Commission and the City, and timely comments from those agencies will be considered by the Energy Commission CPM prior to plan approval.
Ch. 221, Coastal Zone Overlay District; § 221.28 Maximum Height. All rooftop mechanical devices, except for solar panels, shall be set back and screened so that they are not visible.	Consistent, with implementation of **VIS-1**	Staff recommends preparation and implementation of a Visual Screening and Enhancement Plan for Project Structures consistent with the requirements of **VIS-1**. The plan will be submitted to the Coastal Commission and the City, and timely comments from those agencies will be considered by the Energy Commission CPM prior to plan approval. The consistency determination is also based on the City's approved Resolution No. 2014-18 (TN #202084) supporting the applicant's conceptual architectural improvements as modified and the approximately 125-foot-high structures for the project.
Title 23 – Provisions Applying in All or Several Districts		
Ch. 230, Site Standards; § 230.76 Screening of Mechanical Equipment. Exterior mechanical equipment shall be screened from view on all sides. Screening of the top of equipment may be required by the Director, if necessary to protect views from an R or OS district. A mechanical equipment plan shall be submitted to the Director to ensure that the mechanical equipment is not visible from a street or adjoining lot.	Consistent, with implementation of **VIS-1**	The "Huntington By-The-Sea Mobile Estates and RV Park" on Newland Street adjacent to the HBEP site is in an "R" district; the zoning district is RMP – Residential Manufactured Home Park. Staff recommends preparation and implementation of a Visual Screening and Enhancement Plan for Project Structures consistent with the requirements of **VIS-1**. The plan will be submitted to the Coastal Commission and the City, and timely comments from those agencies will be considered by the Energy Commission CPM prior to plan approval. The consistency determination is also based on the City's approved Resolution No. 2014-18 (TN #202084) supporting the applicant's conceptual architectural improvements as modified and the approximately 125-foot-high structures for the project.

Visual Resources Table 2
Proposed Project Consistency with Applicable Visual Resources LORS

LORS Summary Description	Consistency Determination	Basis for Determination
Ch. 231, Off-Street Parking and Loading Provisions; § 231.18 Design Standards. Parking area lighting shall be energy efficient and designed to prevent glare on adjacent residences. Security lighting shall be provided in public areas and shall be on a time clock or photo sensor system.	Consistent, with implementation of **VIS-4, VIS-5,** and **VIS-6**	Staff recommends preparation and implementation of a Lighting Management Plan (**VIS-5**), which will be submitted to the Coastal Commission and the City for review and comment. **VIS-4** requires project lighting during demolition, construction, and commissioning to minimize potential night lighting impacts. **VIS-6** requires a full review of the approved Lighting Management Plan prior to commercial operation of Power Block 2. **VIS-5** and **VIS-6** require new lighting fixtures to achieve high energy efficiency for the HBEP.
Ch. 232, Landscape Improvements; § 232.02 Applicability. Minimum required site landscaping and planting areas shall be installed and maintained in accord with the standards and requirements of this chapter, including all nonresidential projects.	Consistent, with implementation of **VIS-2**	Staff recommends preparation and implementation of a Perimeter Screening and On-site Landscape and Irrigation Plant consistent with the requirements of **VIS-2**. The plan will be submitted to the Coastal Commission and the City, and timely comments from those agencies will be considered by the Energy Commission CPM prior to plan approval.
Ch. 232, Landscape Improvements. **Section 232.04 General Requirements**. Landscape plans prepared by a California State Licensed Landscape Architect shall be submitted for approval to the Public Works and Community Development Departments. Significant changes to approved plans require written approval by City staff and/or officials and the landscape designer. Compliance with the Arboricultural and Landscape Standards and Specifications on file in the Public Works Department is required. **Section 232.06 Materials**. Plans shall be harmonious with the architecture and show a recognizable pattern or theme for the overall development. Plants shall be selected for drought tolerance and adaptability to the Huntington Beach environment. Irrigation systems must follow the water efficient landscape requirements of Chapter 14.52 and the Arboricultural Standards and Specifications on file in the Department of Public Works. **Section 232.08 Design Standards**. A minimum of 8 percent of the total net site areas shall be landscaped, or as required by Title 21 or conditions of approval. **Section 232.10 Irrigation**. All landscaped areas shall have a permanent underground, automated irrigation system to promote healthy plant life.	Consistent, with implementation of **VIS-2**	Staff recommends preparation and implementation of a Perimeter Screening and On-site Landscape and Irrigation Plant consistent with the requirements of **VIS-2**. The plan will be submitted to the Coastal Commission and the City, and timely comments from those agencies will be considered by the Energy Commission CPM prior to plan approval.

Visual Resources Table 2
Proposed Project Consistency with Applicable Visual Resources LORS

LORS Summary Description	Consistency Determination	Basis for Determination
Title 24 – Administration		
Ch. 244, Design Review. **Section 244.02 Applicability**. Design review is required for all projects pursuant to any other provision of this Zoning and Subdivision Ordinance and for all projects located within redevelopment areas, specific plans as applicable, areas designated by the City Council, City facilities or projects abutting or adjoining City facilities, projects in or abutting or adjoining OS-PR and OS-S districts, and General Plan primary and secondary entry nodes. **Section 244.06 Scope of Review**. Specifies that the Board shall consider the arrangement and relationship of proposed structures to one another and to other development in the area. Requires the Board to assess the compatibility in scale and aesthetic treatment of the structures with public district areas. The adequacy of proposed landscaping shall be assessed. The Board shall assess whether energy conservation measures have been proposed and the adequacy of such measures. **Section 244.08 Required Plans and Materials**. Plans and materials to fully describe and explain the proposed development shall be submitted as required by the application form or by the Director, as deemed necessary.	Consistent, with implementation of **VIS-1** and **VIS-2**	Staff recommends preparation and implementation of a Visual Screening and Enhancement Plan for Project Structures (**VIS-1**) and a Perimeter Screening and On-site Landscape and Irrigation Plan (**VIS-2**). Both plans will be submitted to the Coastal Commission and the City, and timely comments from those agencies will be considered by the Energy Commission CPM prior to plan approval.
Sources: California Coastal Act is available on the California Coastal Commission website at <http://www.coastal.ca.gov/whoweare.html>. Zoning and Subdivision Ordinance of the City of Huntington Beach is available at: <http://www.huntingtonbeachca.gov/Government/Elected_Officials/city_clerk/Zoning_Code/index.cfm?cross=ture&department=planning&sub=zoning&page=>.		

PROPOSED FINDINGS

1. The California Coastal Act requires that the scenic and visual qualities of coastal areas be considered and protected as a resource of public importance (Pub. Resources Code § 30251). Permitted development must be sited and designed to restore and enhance visual quality in visually degraded areas where feasible.

2. The existing Huntington Beach Generating Station (HBGS) is the most visually prominent, built feature in the project area, and it is identified in the City's General Plan as a visual weakness that contributes negatively to the visual quality of the community.

3. The Coastal Element of the City's General Plan includes a policy requiring the owners of the electrical generating plant on the Pacific Coast Highway (PCH) to provide adequate buffering and screening measures for any proposal to expand or alter the existing power plant.

4. Construction and operation of a new electrical power plant in the Coastal Zone requires implementation of measures to ensure compliance with applicable laws, ordinances, regulations, and standards pertaining to visual and aesthetic resources.

5. The City of Huntington Beach adopted Resolution No. 2014-18 supporting the applicant's conceptual architectural improvements to screen and enhance views of the Huntington Beach Energy Project (HBEP) (TN #202084). The City approved the resolution with several modifications, including a requirement for the applicant to continue working with the City to improve the effectiveness of visual screening for the project.

6. The long-term schedule for demolition of HBGS structures and construction of the HBEP would substantially degrade the existing visual character and quality of the site and its surroundings, resulting in a significant adverse impact on sensitive viewer groups in the project area. Staff finds that this impact is reduced to less than significant with preparation and implementation of a Construction Screening, Landscape Protection, and Site Restoration Plan.

7. Lighting of the project site and structures during demolition, construction, and operation would create new sources of substantial light or glare that could adversely affect daytime and nighttime views in the area. Illumination of the project site at night would cause a significant adverse impact on visual resources unless mitigation measures were implemented to reduce the impact to less than significant. Staff finds that this impact is reduced to less than significant with implementation of conditions of certification to reduce the effects of lighting during project demolition, construction, and operation, including preparation and implementation of a Lighting Management Plan.

8. Key observation point (KOP) 4 represents the view from Magnolia Street near the PCH toward the HBEP site. Staff finds that the proposed project would substantially degrade the existing visual character of the site and its surroundings for views at or near KOP 4. The proposed project would cause a potentially significant adverse visual impact on sensitive viewer groups represented by this KOP. Implementation of conditions of certification requiring preparation and implementation of plans to visually screen the project site with architectural enhancements, surface treatments, and other screening measures to soften views of the HBEP would reduce the impact for views at or near KOP 4 to less than significant.

9. KOP 5 represents the view from the driveway entrance to the "Huntington By-The-Sea Mobile Estates and RV Park." Staff finds that the proposed project would substantially degrade the existing visual character of the site and its surroundings for views at or near KOP 5. The proposed project would cause a significant adverse visual impact on sensitive viewer groups represented by this KOP. Implementation of conditions of certification requiring preparation and implementation of plans to visually screen the project site with architectural enhancements, surface treatments, and other screening measures to soften views of the HBEP would reduce the impact for views at or near KOP 5 to less than significant.

10. The cumulative baseline condition for adverse visual resources impacts in the project area is already considered significant. The proposed HBEP would contribute considerably to the cumulatively significant effect for visual resources. Implementation of conditions of certification to visually screen and enhance the project site and minimize lighting impacts would reduce this cumulatively significant effect to less than significant.

CONCLUSIONS

Impacts on visual resources were assessed based on the magnitude of the anticipated incremental changes to the visual environment, considering the appropriate baseline conditions (i.e., existing conditions), and the estimated effects of those changes on sensitive viewer groups.

The proposed HBEP would increase the mass, number, and visual prominence of HBEP structures in the views for KOP 4 and KOP 5. Staff identifies significant adverse impacts relating to the project's visual changes and the magnitude of those changes on sensitive viewer groups. Condition of Certification **VIS-1** requires preparation and implementation of a Visual Screening and Enhancement Plan for Project Structures to architecturally screen power plant structures and treat project surfaces to reduce adverse impacts and achieve compliance with applicable visual resources LORS. Condition of Certification **VIS-2** requires preparation and implementation of a Perimeter Screening and On-site Landscape and Irrigation Plan to substantially screen and soften views of the power plant from sensitive viewpoints in the project area. Implementation of these two conditions of certification would reduce adverse impacts on sensitive viewer groups to less than significant and achieve consistency with LORS addressing protection of visual and aesthetic resources.

Because of the long-term schedule for the proposed demolition of HBGS structures and construction of the HBEP, staff concludes that demolition, construction, and commissioning activities would substantially degrade the existing visual character and quality of the site and its surroundings. Staff proposes Condition of Certification **VIS-3** requiring preparation and implementation of a Construction Screening, Landscape Protection, and Site Restoration Plan to reduce this impact to less than significant.

Lighting of the project site and structures during demolition, construction, commissioning, and operation would create new sources of substantial light or glare that could adversely affect nighttime views in the area. Staff proposes Conditions of Certification **VIS-4**, **VIS-5**, and **VIS-6** to reduce the effects of project lighting on visual resources to less than significant. **VIS-5** requires preparation and implementation of a Lighting Management Plan to reduce or avoid the project's operational adverse lighting impacts.

PROPOSED CONDITIONS OF CERTIFICATION

VIS-1 **Visual Screening and Enhancement Plan for Project Structures – Project Operation.** Prior to submitting the master drawings and master specifications list for the project to the Chief Building Official (CBO) and the Compliance Project Manager (CPM), the project owner shall prepare and submit a Visual Screening and Enhancement Plan for Project Structures that includes methods and materials to visually screen and treat surfaces of publicly visible power plant structures. (Condition of Certification **GEN-2** in the **Facility Design** section of the Commission Decision addresses requirements pertaining to the master drawings and master specifications list.) The submitted plan will include evidence of review by a qualified structural or civil engineer and an assessment of the feasibility and structural integrity of the architectural and decorative screening elements contained in the plan. Any design changes recommended by the qualified structural or civil engineer to ensure the structural soundness and safety of the project and the architectural design elements shall be incorporated in the Visual Screening and Enhancement Plan for Project Structures *before* its submittal to the Energy Commission CPM for review and approval, and the City of Huntington Beach and the Coastal Commission for timely review and comment. The plan must be implemented before commercial operation of Power Block 1.

The Visual Screening and Enhancement Plan for Project Structures shall be consistent with the architectural treatments and modifications recommended in Resolution No. 2014-18 adopted by the City of Huntington Beach City Council on April 7, 2014 (TN #202084).Consistent with Resolution No. 2014-18, all power plant structures that are 50 feet tall or taller from ground elevation shall be visually screened with architectural enhancements and other surface treatments to enhance public views of those structures. Surface treatments for all other publicly visible power plant structures shall be included in the plan. Proposed surface treatments shall minimize the potential visual effects of glare from project surfaces. Surface treatments (i.e., painting and/or texturing) alone are not considered adequate to visually screen and enhance the project. Methods to visually screen and enhance the project site shall visually unify the project so that proposed architectural screening and other enhancements for one air cooled condenser are similar to or the same for the other.

The monopoles for the on-site 230-kV transmission line shall have a surface treatment that enables them to blend with the environment to the greatest extent feasible, and the finish shall appear as a matte patina. Unpainted exposed lagging and surfaces of steel structures that are visible to the public shall be embossed or otherwise treated to reduce glare.

The Visual Screening and Enhancement Plan for Project Structures shall meet the following minimum content requirements:

- Inventory of major project structures and buildings specifying the proposed architectural and decorative screening structures and materials to visually screen and enhance those structures. The inventory shall specify height, length, and width or diameter for each major structure, and scale plans and elevation views shall be included in the plan with architectural and project structures clearly identified.
- List of colors and finishes that will be applied to architectural screening structures and directly to power plant structures (e.g., paint scheme and finish types for the air cooled condenser). Proposed colors must be identified by vendor, name, and number, or according to a universal designation system.
- Electronic files and a set of print copies of 11-inch by 17-inch (or larger, if necessary) color visual simulations at life-size scale showing the architectural screening structures and surface treatments proposed for the project. Key observation point (KOP) 1, KOP 4, and KOP 5 shall be used to prepare images showing the completed Visual Screening and Enhancement Plan for Project Structures. Colors must be identified by vendor, name, and number, or according to a universal designation system.
- Schedule for completing construction of architectural and decorative screening structures and the surface treatments for all publicly visible power plant structures.
- Procedure and maintenance schedule to ensure that all surface treatments and architectural structures are well maintained and consistent with the approved plan for the life of the project.

Supplement to the Visual Screening and Enhancement Plan for Project Structures – Prior to submitting instructions and orders for architectural screening materials, prefabricated project structures, and paints and other surface treatments to manufacturers or vendors of project structures, the project owner shall submit a Supplement to the Visual Screening and Enhancement Plan for Project Structures. The supplement shall include color brochures, color chips, and/or physical samples showing each proposed color and finish that will be applied to architectural screening structures and directly to power plant structures. Electronic files showing proposed colors may not be submitted in place of original samples. Colors must be identified by vendor, name, and number, or according to a universal designation system.

The project owner shall meet these plan review and approval requirements:

- The submitted Visual Screening and Enhancement Plan for Project Structures shall include evidence of review by a qualified structural or civil engineer and an assessment of the feasibility and structural integrity of the architectural and decorative screening elements contained in the plan. The qualified engineer's report and other comments shall be attached to the plan.
- The Visual Screening and Enhancement Plan for Project Structures shall be submitted to the CPM for review and approval, and to the City of Huntington Beach Planning and Building Department and the Executive Director of the Coastal Commission for timely review and comment. City staff requests seven sets of plans. Any comments on the plan from the City and the Coastal Commission shall be provided to the CPM. The project owner shall not submit instructions for architectural screens and other structures and colors and finishes to manufacturers or vendors of project structures, or perform final field treatment on any structures, until written approval of the final plan is received from the CPM. Modifications to the Visual Screening and Enhancement Plan for Project Structures are prohibited without the CPM's approval.

Verification: At least 30 calendar days before submitting the master drawings and master specifications list to the CBO (in accordance with the requirements of **GEN-2**), the project owner shall submit a Visual Screening and Enhancement Plan for Project Structures to the CPM for review and approval, and to the City's Planning and Building Department and the Executive Director of the Coastal Commission for timely review and comment.

At least 60 calendar days before submitting any instructions or orders for architectural screening, prefabricated project structures, and paints and other surface treatment materials, the project owner shall submit a Supplement to the Visual Screening and Enhancement Plan for Project Structures to the CPM for review and approval, and to the City's Planning and Building Department and the Executive Director of the Coastal Commission for timely review and comment.

If the CPM determines that the Visual Screening and Enhancement Plan for Project Structures and/or its supplement require revisions, the project owner shall provide a plan with the specified revision(s) for review and approval by the CPM. A copy of the revised plan shall be provided to the City and the Executive Director of the Coastal Commission for timely review and comment.

The project owner shall provide the CPM with copies of the transmittal letters submitted to the City and the Coastal Commission requesting those agencies' respective timely reviews of the plan, the supplement, and any plan revisions.

Before commercial operation of Power Block 1, the project owner shall notify the CPM that the Visual Screening and Enhancement Plan for Project Structures are implemented and the facility is ready for inspection. The project owner shall obtain written confirmation from the CPM that the project complies with the Visual Screening and Enhancement Plan for Project Structures. This step shall be repeated before commercial operation of Power Block 2.

The project owner shall provide a status report regarding maintenance of the architectural screens and surface treatments in the Annual Compliance Report for the project. At a minimum, the report shall include:

- Descriptions of the condition of the architectural screening structures and treated surfaces of all publicly visible structures at the power plant site.
- Descriptions of major maintenance and painting work required to maintain the original condition of architectural screening structures and treated surfaces during the reporting year.
- Electronic photographs showing the results of maintenance and painting work.
- Any scheduled maintenance activities pertaining to the Visual Screening and Enhancement Plan for Project Structures for the next year.

VIS-2 **Perimeter Screening and On-site Landscape and Irrigation Plan – Project Operation.** The project owner shall prepare and implement a Perimeter Screening and On-site Landscape and Irrigation Plan to substantially screen views of power plant structures. The plan shall achieve a goal to screen and soften views of the power plant from Magnolia Marsh, the Huntington Beach Wetlands & Wildlife Care Center, the Huntington By-The-Sea Mobile Estates and RV Park, and along Newland Street, Magnolia Street, and the Pacific Coast Highway. The plan shall include new and replacement landscape plantings in all available on-site perimeter spaces along the northwest, southwest-west, and southeast-east boundaries. The plan shall be prepared with the direct involvement of a qualified professional landscape architect familiar with local growing conditions, suitable native and non-invasive plant species, and local availability of proposed species. Any changes recommended by the qualified landscape architect shall be incorporated in the Perimeter Screening and On-site Landscape and Irrigation Plan *before* its submittal to the Energy Commission Compliance Project Manager (CPM) for review and approval, and the City of Huntington Beach and the Coastal Commission for timely review and comment. The submitted plan shall comply with the landscape and irrigation requirements of the City of Huntington Beach General Plan and the Huntington Beach Zoning & Subdivision Ordinance.

Design and submittal of the Perimeter Screening and On-site Landscape and Irrigation Plan shall occur *after* completion of the project's final general arrangement/site plan to accurately show all interior area constraints (e.g., paved interior site access and emergency response roads).

The Perimeter Screening and On-site Landscape and Irrigation Plan shall include construction of a solid 8-foot-tall decorative masonry wall to extend along the site boundary adjacent to the Huntington Beach Wetlands & Wildlife Care Center and parking lot and along Magnolia Marsh (i.e., the southwest-west and southeast-east boundaries). All existing site perimeter chain-link fencing shall be replaced with a solid 8-foot-tall decorative masonry wall.

The Perimeter Screening and On-site Landscape and Irrigation Plan shall meet the following minimum requirements:

- Provide a detailed landscape and irrigation plan at a scale of 1 inch to 40 feet (1:40) (or similar scale) listing proposed plant species, and installation sizes, quantities, and spacing. The plan shall include expected heights at 10 years and maturity and expected growth rates to maturity. To achieve year-round screening, only evergreen species shall be used. No new or replacement lawn areas shall be planted anywhere on the site interior.
- Proposed tree species shall be 24-inch box size unless the professional landscape architect recommends a different size for a species. Except for areas where planting of new or replacement trees at the site periphery is infeasible (based on the final general arrangement/site plan), spacing of trees shall be sufficiently dense to ensure maximum screening by the tree canopy at maturity. Faster-growing tree species shall be included provided that those species are non-invasive and suited to the coastal environment.
- Proposed shrub species shall be selected to achieve maximum screening effectiveness. Shrubs planted inside the 8-foot-tall masonry wall along Magnolia Marsh shall be selected to achieve a mature height of 12 feet to 15 feet, with a goal to increase the effectiveness of visual screening provided by the wall. Shrubs shall be installed at 5-gallon size unless the professional landscape architect recommends a different size for a species.
- Proposed tree species along the site boundary adjacent to Magnolia Marsh shall be selected with a goal to discourage perching by raptors and minimize predation on special-status birds. Tree species with droopy branches or dense foliage that would not attract perching raptors are preferred.
- Provide electronic files and sets of print copies of 11-inch by 17-inch (or larger, if necessary) color visual simulations at life-size scale showing the landscape plantings at the time of installation and 10 years after installation. Key observation point (KOP) 1, KOP 4, and KOP 5 shall be used to prepare the visual simulations.
- Provide discussions of plans and methods to efficiently irrigate landscape plantings to ensure their survival and maintain optimal growth rates.
- Provide a plan view of the project site that clearly shows the planting plan for the site and the existing and new solid 8-foot-tall decorative masonry walls along the site perimeter. Details on the materials and design of the masonry wall shall be included in the plan.

- Provide a detailed schedule for completing installation of landscape plantings during the project construction schedule and the masonry walls along the site perimeter.
- Provide a procedure for maintaining and monitoring the landscape and irrigation system and replacing all unsuccessful plantings for the life of the project.
- Provide a table summarizing the project's conformance with the City's landscape screening and irrigation regulations, including applicable goals, objectives, and policies in the Urban Design Element, Circulation Element, and Coastal Element of the General Plan, as identified in **VISUAL RESOURCES APPENDIX-4** of the Final Staff Assessment. The table shall include applicable chapters and sections of the Huntington Beach Zoning & Subdivision Ordinance.

The project owner shall meet these plan submittal and review requirements:

- The submitted Perimeter Screening and On-site Landscape and Irrigation Plan shall show evidence of participation by a qualified professional landscape architect familiar with local growing conditions, suitable native and non-invasive plant species for the project area, and local availability of proposed plant species. The landscape architect's report and other comments shall be attached to the plan.
- The submitted plan shall show evidence of participation by a wildlife biologist qualified to comment on tree species proposed for planting adjacent to Magnolia Marsh and confirm that those species will not introduce new opportunities for raptors to prey on special-status birds in the marsh.
- The project owner shall request comments on the plant species proposed along Magnolia Marsh from the Director of the Huntington Beach Wetlands Conservancy. Any comments from the Director shall be attached to the submitted plan.
- The Perimeter Screening and On-site Landscape and Irrigation Plan shall be submitted to the CPM for review and approval, and to the City of Huntington Beach Planning and Building Department and the Executive Director of the Coastal Commission for timely review and comment. City staff requests seven sets of plans. Any comments on the plan from the City and the Coastal Commission shall be provided to the CPM. The project owner shall not purchase or order plants, landscape and irrigation supplies and materials, or construction materials for the masonry wall until written approval of the final plan is received from the CPM. Modifications to the Perimeter Screening and On-site Landscape and Irrigation Plan are prohibited without the CPM's approval.

<u>Verification:</u> At least 90 calendar days before site mobilization, the project owner shall submit the Perimeter Screening and On-site Landscape and Irrigation Plan to the CPM for review and approval, and to the City of Huntington Beach Planning and Building Department and the Executive Director of the Coastal Commission for timely review and comment.

If the CPM determines that the plan requires revision, the project owner shall provide a plan with the specified revision(s) for review and approval by the CPM. A copy of the revised plan shall be provided to the City's Planning and Building Department and the Executive Director of the Coastal Commission for timely review and comment.

The project owner shall provide the CPM with copies of the transmittal letters submitted to the City and the Coastal Commission requesting those agencies' respective timely reviews of the plan and any plan revisions.

Prior to the start of commercial operation of Power Block 1, the project owner shall notify the CPM that some areas covered by the plan elements are finished and ready for inspection (i.e., areas where landscape plantings will not be disturbed by later construction phases). The project owner shall obtain written confirmation from the CPM that the project complies with the Perimeter Screening and On-site Landscape and Irrigation Plan. This step shall be repeated before commercial operation of Power Block 2.

The project owner shall provide a status report describing landscape maintenance activities in the Annual Compliance Report for the project. At a minimum, the report shall describe:

- Overall condition of the landscape areas and irrigation system at the power plant site.
- Major activities that occurred during the reporting year, including replacement of dead or dying vegetation.
- Maintenance of the site periphery masonry wall and any other elements included in the plan.

VIS-3 **Long-term Construction Screening, Landscape Protection, and Site Restoration Plan – Project Demolition, Construction, and Commissioning.** Prior to the start of site mobilization, the project owner shall prepare and implement a Construction Screening, Landscape Protection, and Site Restoration Plan describing methods and materials that will be used during each project phase to screen project construction and parking areas and views of the project site from areas where construction activities have the potential to be visible during a phase. The plan will describe methods and materials to identify and protect existing landscape trees and shrubs that are not within areas affected by the project footprint. The plan will include provisions to restore areas where ground disturbance occurred during construction.

To minimize the adverse visual impacts of project construction during each project phase, the project owner shall install and maintain construction screening fencing along the perimeters of the project site areas where there could be views from public use areas of construction activities during a phase. The Compliance Project Manager (CPM), in consultation with the visual resources staff and the City of Huntington Beach, shall decide where screening fencing is required during a project phase or phases. Depending on the location of on-site construction work, the areas requiring screening include the perimeter of the wetland along the southeast-east site boundary, the west side perimeter of the project site on Newland Street, and the southwest-west perimeter of the site along the Huntington Beach Wetlands Conservancy property adjacent to the Pacific Coast Highway (PCH). The screening fencing for the power plant site shall be no less than 12 feet tall.

Brightly-colored construction exclusion fencing shall be used on-site to clearly delineate areas where existing landscape plantings will be protected and retained.

Condition of Certification **VIS-2** includes construction of a solid 8-foot-tall decorative masonry wall to extend along the site boundary adjacent to the Huntington Beach Wetlands & Wildlife Care Center and the wetland (i.e., the southwest-west and southeast-east boundaries). Upon completing installation of the masonry wall, the CPM shall allow the project owner to remove all construction screening fencing from those portions of the site boundary.

Screening fencing shall be installed to visually screen the open lots that will be used for parking on Newland Street across from the project site and along the PCH at Beach Boulevard. The screening fencing for the parking lots shall be no less than 6 feet tall and shall meet the City of Huntington Beach corner lot visibility requirements specified in Title 23, Chapter 230, “Site Standards,” of the Huntington Beach Municipal Code (i.e., 25-foot by 25-foot corner visibility triangle).

The Construction Screening, Landscape Protection, and Site Restoration Plan shall provide images showing options for site perimeter screening materials; examples shall include fencing materials in unobtrusive shades of green or brown as well as printed decorative designs. Possible options include knitted polyethylene material, bottom-locking fence slats with chain-link fencing, pre-printed mesh fabric, or printable mesh vinyl. All site perimeter screening fencing and construction exclusion fencing shall be well maintained and repaired or replaced as necessary for the duration of project demolition, construction, and commissioning.

When construction is finished, all evidence of construction activities shall be removed—including ground disturbance at staging, material storage, and construction worker parking areas—and restored to its original or better condition. The Construction Screening, Landscape Protection, and Site Restoration Plan shall describe the methods and schedule for the restoration work to occur.

The Construction Screening, Landscape Protection, and Site Restoration Plan shall be submitted to the CPM for review and approval, and to the City of Huntington Beach Planning and Building Department and the Executive Director of the Coastal Commission for timely review and comment. City staff requests seven sets of plans. Any comments on the plan from the City and the Coastal Commission shall be provided to the CPM. The project owner shall not purchase or order any materials for site perimeter screening fencing until written approval of the final plan is received from the CPM. Modifications to the Construction Screening, Landscape Protection, and Site Restoration Plan are prohibited without the CPM's approval.

Verification: At least 60 calendar days before the start of site mobilization, the project owner shall submit a Construction Screening, Landscape Protection, and Site Restoration Plan to the CPM for review and approval, and to the City of Huntington Beach Planning and Building Department and the Executive Director of the Coastal Commission for timely review and comment. The project owner shall provide the CPM with a copy of the transmittal letters submitted to the City and the Coastal Commission requesting those agencies' respective timely reviews of the plan.

If the CPM determines that the plan requires revision, the project owner shall provide a plan with the specified revision(s) for review and approval by the CPM. A copy of the revised plan shall be provided to the City's Planning and Building Department and the Executive Director of the Coastal Commission for timely review and comment.

The project owner shall provide the CPM with copies of the transmittal letters submitted to the City and the Coastal Commission requesting those agencies' respective timely reviews of the plan and any plan revisions.

The project owner shall install all site perimeters screening fencing and construction exclusion and parking area fencing before the start of ground disturbance at the project site. The project owner shall notify the CPM within 7 calendar days of installing the screening and construction exclusion fencing that it is ready for inspection.

The project owner shall report any work required to repair or replace temporary screening and construction exclusion fencing in the Monthly Compliance Report for the project.

Within 10 calendar days of receipt of confirmation from the project owner that the permanent 8-foot-tall masonry wall has been completed, the CPM shall notify the project owner that construction screening fencing can be removed from the portions of the site boundaries where the masonry wall is erected.

The project owner shall complete site restoration within 60 calendar days of completing construction of the HBEP power blocks and buildings, including demolition of HBGS Units 1 and 2. The project owner shall notify the CPM within 7 calendar days of completing site restoration that restored areas are ready for inspection.

VIS-4 Long-term Lighting – Project Demolition, Construction, and Commissioning. Consistent with applicable worker safety regulations, the project owner shall ensure that lighting of on-site construction areas, construction worker parking lots, and construction laydown areas minimizes potential adverse night lighting impacts by implementing the following measures:

- All fixed-position lighting shall be hooded and shielded to direct light downward and toward the construction area to be illuminated to prevent illumination of the night sky and minimize light trespass (i.e., direct light extending beyond the boundaries of the construction worker parking lots and construction sites, including any security-related boundaries).
- Lighting of any tall construction equipment (e.g., scaffolding, derrick cranes, etc.) shall be directed toward areas requiring illumination and shielded to the maximum extent practicable.
- Task-specific lighting shall be used to the maximum extent practicable.
- Wherever and whenever feasible, lighting shall be kept off when not in use and motion sensors shall be used to the maximum extent practicable.
- The Compliance Project Manager (CPM) shall be notified of any construction-related lighting complaints. Complaints shall be documented using a form in the format shown in **Attachment 1**, and completed forms shall record resolution of each complaint. A copy of each completed complaint form shall be provided to the CPM. Records of lighting complaints shall also be kept in the compliance file at the project site.

Verification: Within 7 calendar days after the first use of fixed-position parking area and construction-related lighting for major HBEP construction milestones, the project owner shall notify the CPM that the lighting is ready for inspection. Verification is to be repeated for these three construction milestones:

- demolition of HBGS Unit 5 and east fuel oil tank and construction of Power Block 1,
- construction of Power Block 2, and
- demolition of HBGS Units 1 and 2 and construction of Buildings 33 and 34.

If the CPM determines that modifications to the lighting are needed for any construction milestone, within 14 calendar days of receiving that notification, the project owner shall correct the lighting and notify the CPM that modifications have been completed.

Within 48 hours of receiving a lighting complaint for any construction activity, the project owner shall provide to the CPM a copy of the complaint report and resolution form, including a schedule for implementing corrective measures to resolve the complaint.

The project owner shall report any lighting complaints and document their resolution in the Monthly Compliance Report for the project, accompanied by copies of completed complaint report and resolution forms for that month.

VIS-5 **Lighting Management Plan – Project Operation.** Prior to commercial operation of the HBEP Power Block 1, the project owner shall prepare and implement a comprehensive Lighting Management Plan for the HBEP.

Consistent with applicable worker safety regulations, the project owner shall ensure the design, installation, and maintenance of all permanent exterior lighting such that light sources are not directly visible from areas beyond the project site, reflected glare is avoided, and night lighting impacts are minimized or avoided to the maximum extent feasible. All lighting fixtures shall be selected to achieve high energy efficiency for the HBEP facility.

The project owner shall meet these requirements for permanent project lighting:

- The Lighting Management Plan shall be prepared with the direct involvement of a certified lighting professional trained to integrate efficient technologies and designs into lighting systems. The plan shall include evidence of the certified lighting professional's participation in plan preparation.
- Exterior lights shall be hooded and shielded and directed downward or toward the area to be illuminated to prevent obtrusive spill light (i.e., light trespass) beyond the project site.
- Exterior lighting shall be designed to minimize backscatter to the night sky to the maximum extent feasible.
- Energy efficient lighting products and systems shall be used for all permanent new lighting installations. Smart bi-level exterior lighting using high efficiency directional LED fixtures shall be used as appropriate for exterior installations. The lighting system shall work in conjunction with occupancy sensors, photo sensors, wireless controls, and/or other scheduling or controls technologies to provide adequate light for security and maximize energy savings.
- Lighting fixtures shall be kept in good working order and continuously maintained according to the original design standards.
- The Compliance Project Manager (CPM) shall be notified of any complaints about permanent lighting at the project site. Complaints shall be documented using a form in the format shown in **Attachment 1**, and completed forms shall record resolution of each complaint. A copy of each completed complaint form shall be provided to the CPM. Records of lighting complaints shall also be kept in the compliance file at the project site.

The project owner shall meet these plan submittal and review requirements:

- The comprehensive Lighting Management Plan shall be submitted to the CPM for review and approval, and to the City of Huntington Beach Planning and Building Department and the Executive Director of the Coastal Commission for timely review and comment. City staff requests seven sets of plans. Any comments on the plan from the City and the Coastal Commission shall be provided to the CPM.
- The project owner shall not purchase or order any lighting fixtures or apparatus until written approval of the final plan is received from the CPM. Modifications to the Lighting Management Plan are prohibited without the CPM's approval. Installation of lighting must be completed by the start of commercial operation of Power Block 1.

Verification: At least 90 calendar days before ordering any permanent lighting equipment for Power Block 1 and related facilities and structures, the project owner shall submit a comprehensive Lighting Management Plan to the CPM for review and approval, and to the City of Huntington Beach Planning and Building Department and the Executive Director of the Coastal Commission for timely review and comment. The project owner shall provide the CPM with a copy of the transmittal letters submitted to the City and the Coastal Commission requesting those agencies' respective timely reviews of the Lighting Management Plan.

If the CPM determines that the plan requires revision, the project owner shall provide a plan with the specified revision(s) for review and approval by the CPM. A copy of the revised plan shall be provided to the City's Planning and Building Department and the Executive Director of the Coastal Commission for timely review and comment.

The project owner shall provide the CPM with copies of the transmittal letters submitted to the City and the Coastal Commission requesting those agencies' respective timely reviews of the Lighting Management Plan and any plan revisions.

Prior to the start of commercial operation of Power Block 1, the project owner shall notify the CPM that installation of permanent lighting for Power Block 1 has been completed and that the lighting is ready for inspection. If the CPM notifies the project owner that modifications to the lighting system are required, within 30 days of receiving that notification, the project owner shall implement all specified changes and notify the CPM that the modified lighting system(s) is ready for inspection.

Within 48 hours of receiving a complaint about permanent project lighting, the project owner shall provide to the CPM a copy of the complaint report and resolution form, including a schedule for implementing corrective measures to resolve the complaint.

The project owner shall report any complaints about permanent lighting and document their resolution in the Annual Compliance Report for the project, accompanied by copies of completed complaint report and resolution forms for that year.

VIS-6 Lighting Management Plan, Review and Letter Report – Project Operation. Prior to commercial operation of the HBEP Power Block 2, the project owner shall conduct a full review of the approved Lighting Management Plan to determine whether updates to the plan are needed (e.g., to implement lighting technology changes). Review of the plan shall include preparation of a letter report summarizing conclusions and recommendations for the lighting plan. The plan review shall be conducted with the direct involvement of a certified lighting professional trained to integrate efficient technologies and designs into lighting systems. The letter report shall include evidence of the certified lighting professional's participation in plan review.

The plan review and letter report shall be submitted to the Compliance Project Manager (CPM) for review and approval and the City of Huntington Beach Planning and Building Department for timely review and comment. Any comments on the letter report from the City shall be provided to the CPM.

The project owner shall not purchase or order any permanent lighting for Power Block 2 or new buildings (including administrative or maintenance buildings or warehouses) until written approval of the plan review and letter report is received from the CPM. Installation of lighting must be completed by the start of commercial operation of Power Block 2.

Verification: At least 60 calendar days before ordering any permanent lighting for Power Block 2 and other buildings and structures, the project owner shall submit the plan review and letter report to the CPM for review and approval and the City of Huntington Beach Planning and Building Department for timely review and comment. The project owner shall provide the CPM with a copy of the transmittal letter submitted to the City requesting the City's timely review of the letter report.

Prior to the start of commercial operation of Power Block 2, the project owner shall notify the CPM that installation of permanent lighting has been completed and that the lighting is ready for inspection. If the CPM notifies the project owner that modifications to the lighting system are required, within 30 days of receiving that notification, the project owner shall implement all specified changes and notify the CPM that the modified lighting system(s) is ready for inspection.

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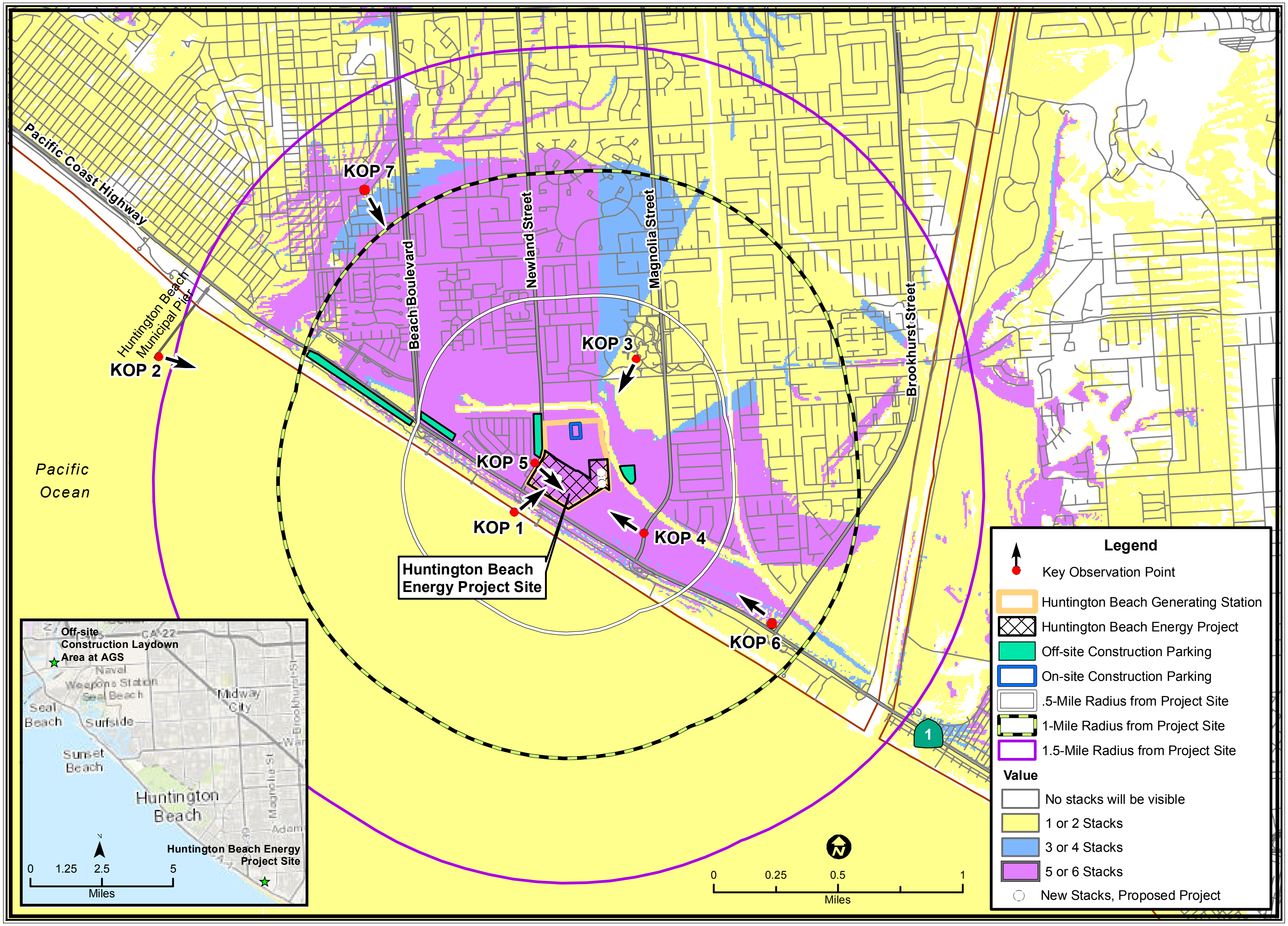
VISUAL RESOURCES - FIGURE 1

Huntington Beach Energy Project - Proposed Project Viewshed

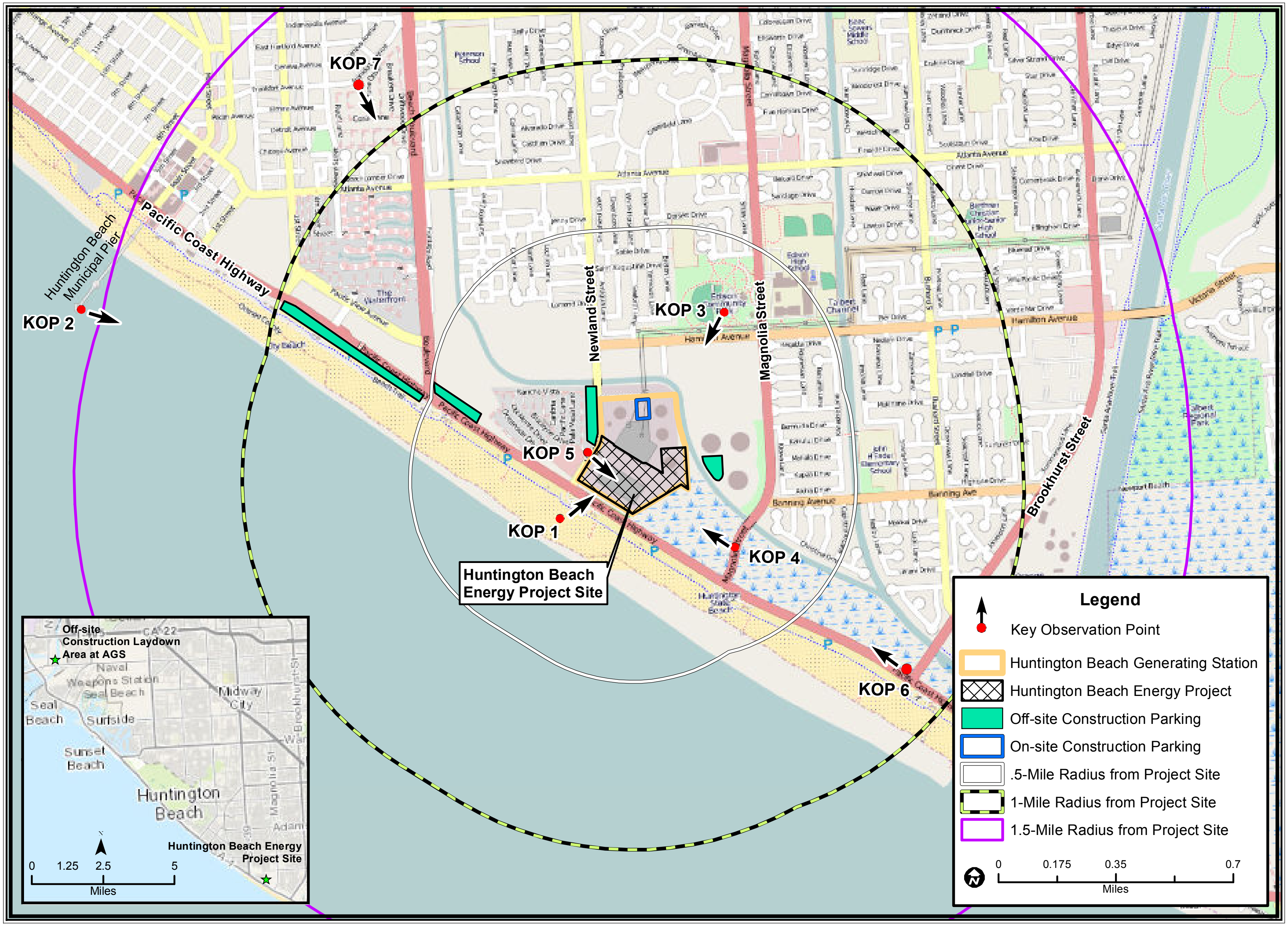


CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCE: Adapted from AES Southland Development 2012c, CH2MHill, Esri, & USGS

VISUAL RESOURCES - FIGURE 2

Huntington Beach Energy Project - Proposed Project Site and Key Observation Points



CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCE: Adapted from AES Southland Development 2012c, CH2MHill, Esri, & USGS

VISUAL RESOURCES - FIGURE 3a

Huntington Beach Energy Project - KOP 1 - View from Huntington State Beach, Existing View

CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCE: AES Southland Development 2013

VISUAL RESOURCES - FIGURE 3b

Huntington Beach Energy Project - KOP 1 - View from Huntington State Beach, Simulated View

View depicts HBEP 5 years after completion of development.

CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCE: AES Southland Development 2013

VISUAL RESOURCES - FIGURE 4

Huntington Beach Energy Project - Proposed Project Site, Characteristic View from the Huntington State Beach Area

SOURCE: Energy Commission Staff

VISUAL RESOURCES - FIGURE 5

Huntington Beach Energy Project - Proposed Project Site, Characteristic View for Southbound Motorists on the Pacific Coast Highway

CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCE: Energy Commission Staff

VISUAL RESOURCES - FIGURE 6a

Huntington Beach Energy Project - KOP 2 - View from Huntington Beach Municipal Pier, Existing View

CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCE: AES Southland Development 2012b

VISUAL RESOURCES - FIGURE 6b

Huntington Beach Energy Project - KOP 2 - View from Huntington Beach Municipal Pier, Simulated View

SOURCE: AES Southland Development 2012b

VISUAL RESOURCES - FIGURE 7

Huntington Beach Energy Project - Huntington Beach, Characteristic View from the Huntington Beach Municipal Pier

SOURCE: Energy Commission Staff

VISUAL RESOURCES - FIGURE 8a

Huntington Beach Energy Project - KOP 3 - View from Edison Community Park, Existing View

CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCE: AES Southland Development 2012b

VISUAL RESOURCES - FIGURE 8b

Huntington Beach Energy Project - KOP 3 - View from Edison Community Park, Simulated View

CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCE: AES Southland Development 2012b

VISUAL RESOURCES - FIGURE 9

Huntington Beach Energy Project - Edison Community Park, Characteristic View in the Park

CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCE: Energy Commission Staff

VISUAL RESOURCES - FIGURE 10a

Huntington Beach Energy Project - KOP 4 - View from Magnolia Street near the Pacific Coast Highway, Existing View

CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCE: AES Southland Development 2013

VISUAL RESOURCES - FIGURE 10b

Huntington Beach Energy Project - KOP 4 - View from Magnolia Street near the Pacific Coast Highway, Simulated View

View depicts HBEP 5 years after completion of development.

VISUAL RESOURCES - FIGURE 11

Huntington Beach Energy Project - Brookhurst Marsh and the Huntington Beach Channel, Characteristic View from Magnolia Street

SOURCE: Energy Commission Staff

VISUAL RESOURCES - FIGURE 12a

Huntington Beach Energy Project - KOP 5 - View from the Driveway Entrance to the Huntington-By-The-Sea Mobile Estates and RV Park, Existing View

Note:
A print copy with an image width of about 18 1/2 inches and held at a reading distance of approximately 12 inches would approximately represent life-size scale.

SOURCE: AES Southland Development 2013

VISUAL RESOURCES - FIGURE 12b

Huntington Beach Energy Project - KOP 5 - View from the Driveway Entrance to the Huntington-By-The-Sea Mobile Estates and RV Park, Simulated View

Note:
A print copy with an image width of about 18 1/2 inches and held at a reading distance of approximately 12 inches would approximately represent life-size scale.

SOURCE: AES Southland Development 2013

VISUAL RESOURCES - FIGURE 13

Huntington Beach Energy Project - Newland Street, Characteristic View toward the Southern California Edison Switchyard

CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCE: Energy Commission Staff

VISUAL RESOURCES - FIGURE 14a

Huntington Beach Energy Project - KOP 6 - View from the Pacific Coast Highway near Brookhurst Street, Existing View

CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCE: AES Southland Development 2012b

VISUAL RESOURCES - FIGURE 14b

Huntington Beach Energy Project - KOP 6 - View from the Pacific Coast Highway near Brookhurst Street, Simulated View

SOURCE: AES Southland Development 2012b

VISUAL RESOURCES - FIGURE 15a

Huntington Beach Energy Project - KOP 7 - View from the Southern Bluff of the Huntington Beach Mesa, Existing View

CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCE: AES Southland Development 2012b

VISUAL RESOURCES - FIGURE 15b

Huntington Beach Energy Project - KOP 7 - View from the Southern Bluff of the Huntington Beach Mesa, Simulated View

CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCE: AES Southland Development 2012b

VISUAL RESOURCES - FIGURE 16

Huntington Beach Energy Project - KOP 1 - City of Huntington Beach Recommended Architectural Improvements

CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCE: TN #202084

VISUAL RESOURCES - FIGURE 17

Huntington Beach Energy Project - KOP 4 – City of Huntington Beach Recommended Architectural Improvements

VISUAL RESOURCES - FIGURE 18
Huntington Beach Energy Project - KOP 5 – City of Huntington Beach Recommended Architectural Improvements

Note:
A print copy with an image width of about 18 1/2 inches and held at a reading distance of approximately 12 inches would approximately represent life-size scale.

VISUAL RESOURCES - FIGURE 19

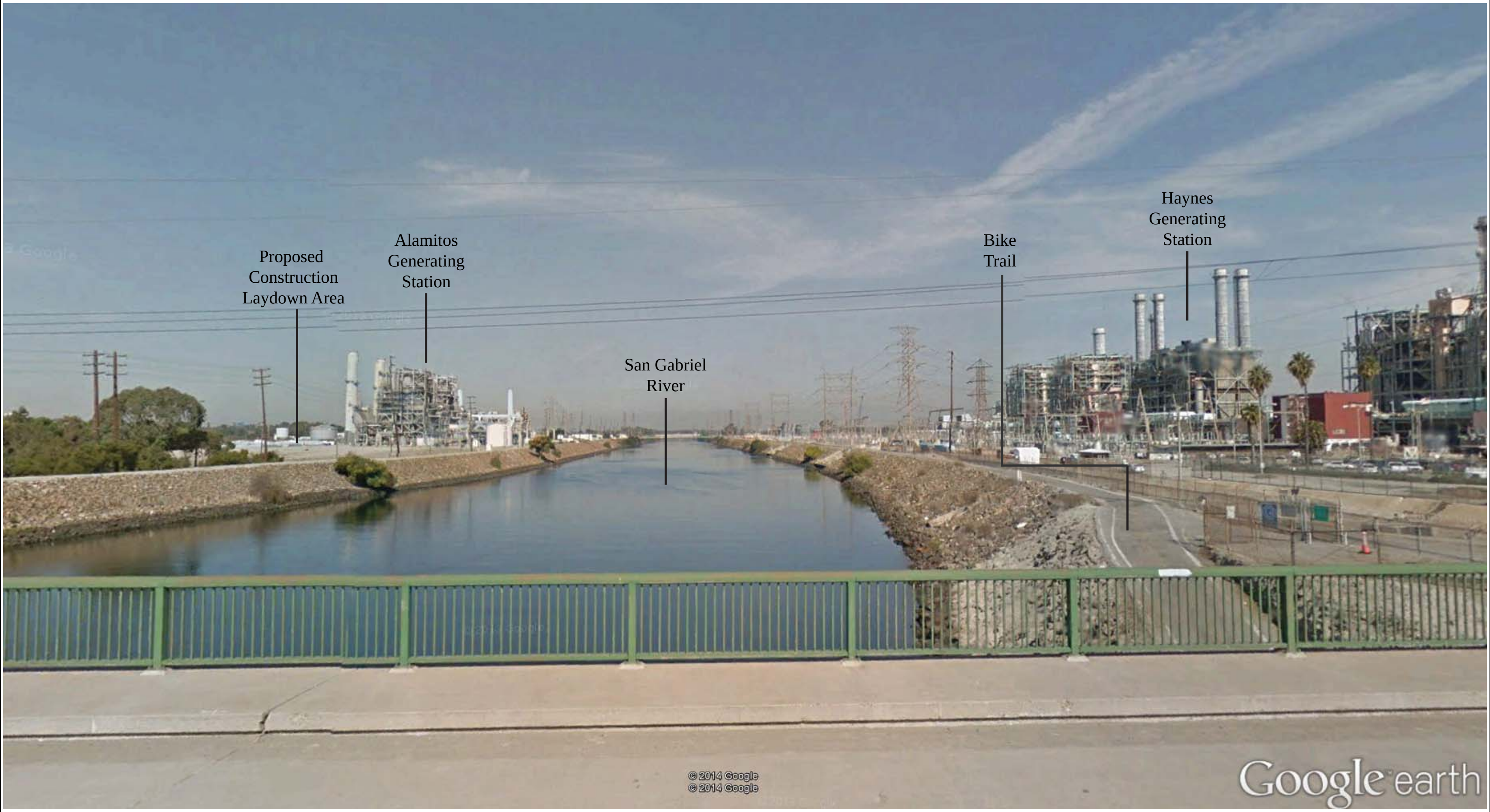
Huntington Beach Energy Project - Proposed Project Construction Parking Areas

CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCE: Adapted from AES Southland Development 2012b; CH2MHILL

VISUAL RESOURCES - FIGURE 20

Huntington Beach Energy Project - View Toward Proposed Off-site Construction Laydown Area from Westbound Westminster Boulevard



SOURCE: Google Earth 2014

VISUAL RESOURCES - FIGURE 21a

Huntington Beach Energy Project - Examples of Construction Screening

Example: Knitted polyethylene construction fence

Example: Bottom-locking fence slats and chain link fence

CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMETAL PROTECTION DIVISION

SOURCE: http://www.fencescreen.com

Example: Pre-printed mesh fabric

Example: Printable mesh vinyl construction fence

SOURCE: http://www.fencescreen.com, http://printb3.com

VISUAL RESOURCES - FIGURE 22

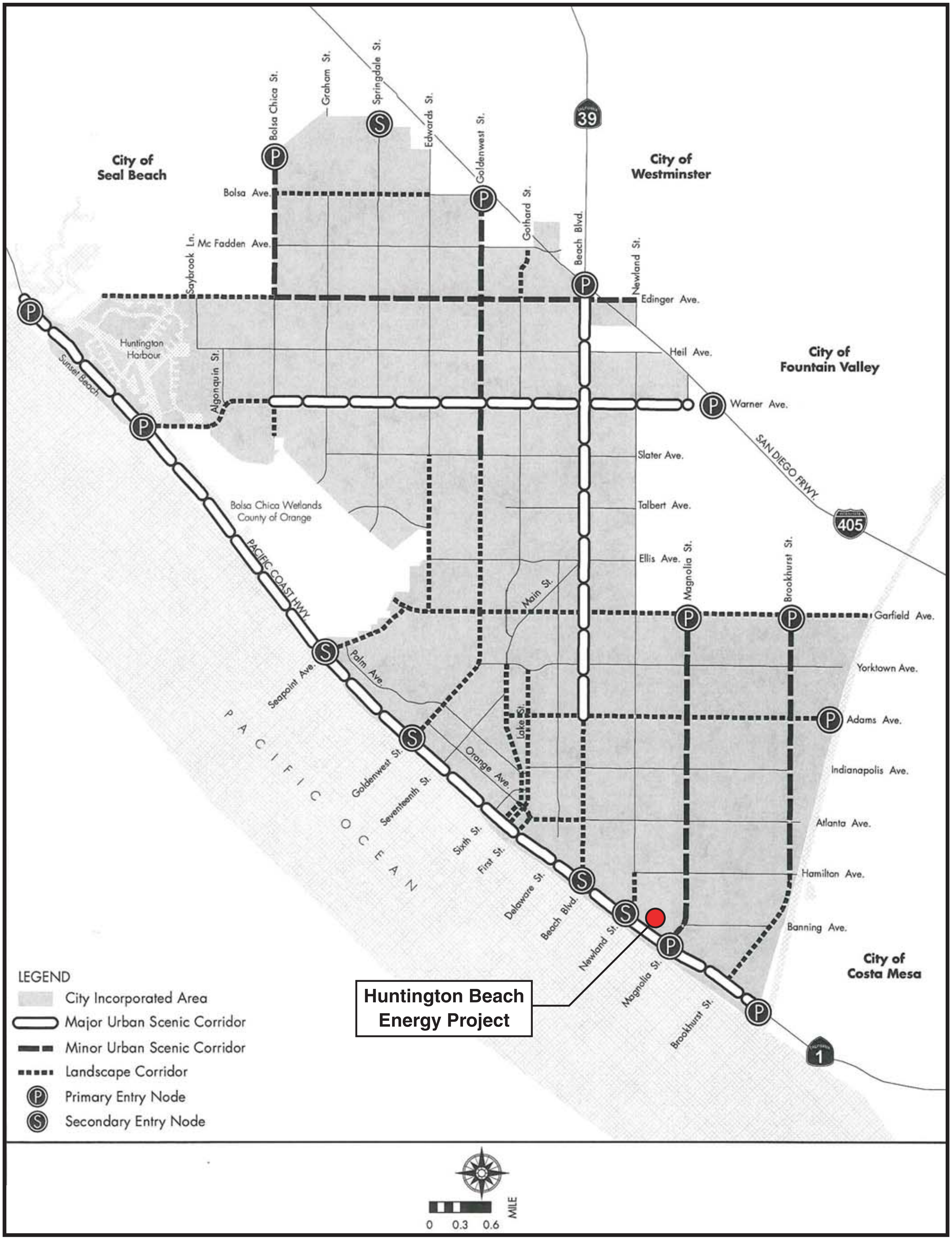
Huntington Beach Energy Project - Cumulative Projects

CALIFORNIA ENERGY COMMISSION, SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCES: Bing - USGS Aerial Image, CH2MHill, Energy Commission Staff

VISUAL RESOURCES - FIGURE 23

Huntington Beach Energy Project - Scenic Corridors, Landscape Corridors, and Entry Nodes



CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCE: Adapted from City of Huntington Beach 2013a

VISUAL RESOURCES APPENDIX-1

VISUAL RESOURCES TERMS, DEFINITIONS, AND ANALYSIS METHOD

This appendix is divided into two main sections. The first section defines key terms and describes the method used by Energy Commission staff (staff) to evaluate effects of the proposed project on visual resources. The second section describes the process to evaluate effects of publicly visible water vapor plumes on visual resources.

Staff conducted a preliminary analysis of the proposed project’s exhaust gas characteristics and ambient air conditions and determined that conditions would be unlikely to cause formation of visible plumes above the project’s exhaust stacks. Therefore, the section of this appendix pertaining to visible plumes is not applicable to the proposed project.

KEY TERMS AND ANALYSIS METHOD

VISUAL SPHERE OF INFLUENCE AND DISTANCE ZONES

The *visual sphere of influence* (VSOI) depicts the area within which the proposed project could cause significant impacts on visual resources. The extent of the VSOI will vary depending on the project setting, topography, and the presence or absence of natural or built screening, and it must be determined on a case-by-case basis. For projects in urban settings, visibility of a project site may be limited to specific vantage points in the VSOI. For projects in relatively open areas, a project site may be visible throughout most of the VSOI.

A VSOI boundary may be refined to account for local viewing conditions and topographic screening based on computer *viewshed* analysis and mapping, which is a useful way to determine project visibility and to communicate that information to others. A viewshed is the surface area visible from a given viewpoint or series of viewpoints. It is also the area from which that viewpoint or series of viewpoints may be seen. At a basic level, a viewshed is a plan view or map of areas with an unobstructed sightline to a single observer viewpoint (U.S. Department of Transportation 1990).

The VSOI may be mapped up to a distance of approximately 5 miles from a project site. At the limits of the VSOI, distant background features may blend together such that they would not be especially discernible to the viewer.

Visual resource management guidelines and methods established by federal agencies are often adapted and used by staff to evaluate the impacts of a project on visual resources. The visual management system of the U.S. Forest Service uses distance zones to describe parts of a characteristic landscape that is subject to inventory and evaluation (Bacon 1979). The U.S. Department of Transportation (USDOT) uses similar descriptions for distance zones (USDOT 1990). Staff includes a discussion of distance zones to describe views of the project site from parts of the VSOI, which are described as follows:

- **Foreground.** This zone will usually be limited to areas within one-quarter to one-half mile of the observer, but must be determined on a case-by-case basis as should any distance zoning. The limit of this zone is based on distances at which details can be perceived. For example, the viewer may see the texture and form of individual plants or tree boughs. Intensity of color and its value will be at a maximum level.
- **Middleground.** This zone may extend from the foreground zone to 3 to 5 miles from the observer. Texture is generally characterized by masses of trees in stands of uniform tree cover. Parts of the landscape may be seen to join together; hills become a range or trees appear as a forest. Individual tree forms are usually only discernible in very open or sparse stands.
- **Background.** This zone may extend from the middleground zone to infinity. The surfaces of land forms lose detail distinctions, and the emphasis is on the outline or edge of the land forms. The texture in stands of uniform tree cover is generally very weak or nonexistent. In open or sparse timber stands, texture is seen as groups or patterns of trees. Atmospheric haze may diminish colors, soften features, and reduce contrast in background views.

Visual elements closer to the viewer will be in the foreground or middleground. Visual elements at the limits of the project VSOI will generally be those that appear in the background.

VISUAL ABSORPTION CAPABILITY

Visual absorption capability (VAC) provides an additional perspective on the landscape and its capacity to visually withstand or absorb changes from a project. VAC is an estimate or measure of the capacity of a landscape to absorb visual alterations without significantly affecting visual character (Bacon 1979). High VAC may be associated with varied, undulating landforms and varied vegetation canopy. Low VAC may be associated with a uniform landscape, an even tree canopy, and steep slopes. (As the upward slope increases, a greater area of land becomes directly visible and any intervening vegetation loses the potential to screen the activity.)

SELECTION OF KEY OBSERVATION POINTS

Sensitive viewing areas are identified and inventoried in the VSOI for a project where project structures and facilities could be visible to the public. A list of sensitive viewing areas could include several types of uses:

- residential;
- recreational, including wildlife areas, parks, visitor centers, hiking trails, and other recreation areas;
- travel routes, including major roads or highways and designated scenic roads; and
- tourist destinations, including historic landmarks and other protected natural and built features in the landscape.

Refinement of the visual analysis for a project involves identifying critical viewpoints, or key observation points (KOPs). KOPs are selected to represent the most critical viewpoints from off-site locations where a project would be visible to the public. Because it is infeasible to analyze all viewpoints, KOPs are selected that would most clearly display the visual effects of the proposed project. A KOP may also represent a primary viewer group(s) (e.g., motorists on a highway in the project area) that could potentially be affected by a project.

Following selection of the KOPs, photographs are taken of the project site to show existing conditions from the KOPs. The existing condition (baseline) photographs taken from the selected KOPs are used to prepare representative visual simulations of the proposed project or specific project feature. The simulations portray the relative scale and extent of the project. The photograph of the existing condition and the visual simulation (proposed condition) are reviewed for each KOP to determine the potential effects of a project on visual resources.

PROCESS TO EVALUATE KEY OBSERVATION POINTS

VISUAL SENSITIVITY (EXISTING CONDITION)

Steps to evaluate the overall visual sensitivity for each KOP consider several key variables: *visual quality, viewer concern (also referred to as viewer sensitivity), visibility, number of viewers,* and *duration of view*. In a project analysis, the rating scale ranges from low to high for each variable. These variables are also used to convey the overall scenic value of the view from each representative KOP. The five variables are described below. (**Diagram 1** [below] illustrates the process to evaluate the KOPs and determine impact significance.)

Visual Quality

Visual quality is an expression of the visual impression or appeal of a given landscape and the associated public value attributed to the visual resource. The visual quality of an area is composed of visual or scenic resources, which are those physical features that make up the visible landscape, including land, water, vegetation, and the built environment (e.g., buildings, roadways, irrigation canals, utilities, and other structures). Scenic resources that compose scenic views and sites are generally valued for their aesthetic appearance.

Memorable or visually powerful landscapes are generally rated high when the landscape components combine in striking or distinctive visual patterns. Landscapes with high visual quality are visually coherent and harmonious when each element is considered as part of the whole. The landscapes are free from encroaching elements and thus retain their visual integrity. Landscapes rated low are often dominated by visually discordant built elements.

The publication, *Visual Impact Assessment for Highway Projects* (USDOT 1990), describes approaches to evaluating visual quality. One approach is focused on visual relationships rather than particular landscape components. A set of evaluative criteria that has proven useful and effective for appraising visual relationships and assessing visual quality includes the following three criteria (USDOT 1990):

- **Vividness.** This is the visual power or memorability of landscape components as they combine in striking and distinctive visual patterns.

- **Intactness.** This refers to the visual integrity of the natural and built landscape and its freedom from encroaching elements. This factor can be present in well-kept urban and rural landscapes and in natural settings.

- **Unity.** This is the visual coherence and compositional harmony of the landscape considered as a whole. Unity frequently attests to the careful design of individual components in the landscape.

Visually successful projects usually achieve a balance between the three criteria (USDOT 1990). However, in many urban settings, the number and variety of existing built forms suggest that enhancing overall visual unity may be a more effective approach to improving visual quality than attempting to introduce vivid new forms into the setting (USDOT 1990).

Using staff's visual resources analysis method, visual quality is generally rated from low to high.

Viewer Concern

Viewer concern (also referred to as viewer sensitivity) represents the estimated reaction of a viewer or viewer group to changes in the view. Viewer concern will vary depending on the characteristics and preferences of the viewer group. An assessment of viewer concern can be made based on the extent of the public's concern for a particular landscape or for scenic quality in general.

Viewer concern for homeowners or other local residents is expected to be high for views near their homes. Viewers engaging in recreational activities and enjoying scenic surroundings are generally expected to be highly concerned about potential degradation of the existing visual quality and character of their views. High viewer sensitivity can be critical to project planning and design because it heightens viewer response and increases the importance of visual resource issues (USDOT 1990).

Viewer activity is an identifying characteristic of viewer groups (USDOT 1990). Commuting in heavy traffic can distract an observer from many aspects of the visual environment; therefore, viewer concern tends to be lower for views seen by people driving to and from work or as part of their work. Employees, managers, and patrons of businesses may have extended and repeated views of their surroundings on a daily basis. This viewer group may have lower expectations for visual elements in the VSOI than residents and recreationists.

The viewer concern of motorists generally depends on when and where travel occurs, the angle of view, the view distance, and the frequency of travel of the motorist in a particular area. As the observer's speed increases, the sharpness of lateral vision declines, and the observer tends to focus along the line of travel. It is assumed that motorists on freeway systems during periods of free flow travel have a low to moderate viewer concern. Daily commuters using inner city freeways in heavy traffic are primarily focused on traffic and roadway conditions along the travel corridor. Commuters traveling at normal freeway speeds are generally more aware of views from the freeway. Motorists driving for pleasure are expected to have a higher concern for view. Motorists who are local residents and/or business owners may have a higher viewer concern due to their personal investment in the area and greater familiarity with the local environment.

In urban and semi-rural settings, individual viewers are likely to include employees and managers working in offices and commercial and industrial businesses. In rural and semi-rural areas, individual viewers may include people employed in agricultural, industrial, and commercial businesses. For viewers whose focus is on their work and daily pursuits, viewer concern is generally expected to be low to moderate. However, this rating will vary depending on the existing visual quality of the landscape and built environment.

Scenic roadways, cultural features, or other areas identified in adopted land use planning documents are subject to protection. The scenic qualities of protected resources are recognized for their value to the public, and the expectation of viewers is that views of protected resources will be preserved.

Visibility

An assessment of visibility addresses how well the project site or feature can be seen from a particular location. The degree of visibility generally depends on the angle or direction of view; extent of visual screening provided by built and/or natural elements; topography; and the distance between the object (i.e., the project site) and existing homes, streets, or parks. In this sense, visibility is determined by considering any and all obstructions that may be in the sightline, including trees and other vegetation, buildings, hills, and transmission poles or towers.

Number of Viewers

This is an estimate of the number of viewers who may see the project site or feature. The estimate is based on the number of residences, the average traffic volume on local roads and highways, and the number of recreational users per day (e.g., the number of people participating in any recreational activity during a 24-hour period). Traffic volume is based on data such as average daily vehicle trips (ADT) or annual average daily vehicle trips (AADT).

For recreational users, the number of viewers is closely tied to visual quality and viewer concern. For recreationists engaged in activities where visual quality is on the higher end of the scale, the number of viewers is carefully considered in the visual assessment. For example, a recreational area in an area with a high visual quality rating may receive a higher rating overall regardless of the number of viewers. For example, a visual change at a national park is generally more important than a visual change near a large sports stadium.

Table 1 shows ratings based on estimated numbers of viewers. The significance of these ratings will be influenced by the activities of the viewers.

Table 1
Approximate Number of Viewers By Viewer Category and Corresponding Rating

Residential (number of residences	Recreationists (number of people per day)	Motorists (number of motor vehicles per day)	Rating
Over 100	Over 200	Over 10,000	High
50–100	100–200	5,000–10,000	Moderate to High
20–50	50–100	2,500–5,000	Moderate
5–20	25–50	500–2,500	Low to Moderate
2–5	10–25	125–500	Low
Source: Energy Commission staff			

Duration of View

Duration of view is the estimated length of time a project site is viewed by a person or group of people. The importance of view duration varies depending on the activities of the viewers. Duration of view is generally less of a concern when the viewer only briefly glimpses the visible feature or site. However, if the site is subject to viewing for a longer period, as from a scenic overlook, then duration of view is a variable of greater importance. Residential viewers typically have the longest duration of view. A resident with a direct view of a project site might have views lasting for extended periods depending on the orientation of the residence and the extent of visual screening.

For motorists, the duration of view depends on the speed of travel, view distance, and angle of observation. For a motorist traveling at 60 miles per hour on a highway with a direct view of a project site, and where the initial point of visibility is approximately 1 mile away, the viewer might see the site for a continuous 60-second period.

The duration of view for recreationists will vary depending on whether the recreational activity is *active* or *passive*. Active recreation involves direct participation in a sport or play activity, which typically requires the use of an organized space (e.g., off-road bike trails or a team sports field). A view of a proposed project by people observing or engaging in active recreation is estimated to be of short duration. People engaging in recreational activities under these conditions are likely to be focused on the sport rather than the aesthetics of the environment.

Passive recreation often involves low impact activities or observation and does not require use of an organized play or sports area. Viewers are more closely associated with the surrounding physical environment where the activity takes place. Typical activities include climbing, hiking, wildlife observation, fishing, and picnicking. A view of a proposed project by an individual engaged in passive recreation is estimated to be of longer duration than for someone participating in active recreation.

Table 2 provides a baseline to determine the ratings associated with view duration. As with number of viewers, variations in viewer preferences and activities will influence the relative importance of the ratings for duration of view.

Table 2
Approximate Duration of View and Corresponding Rating

Approximate Duration of View	Rating
Longer than 2 minutes	High (extended period of time)
1–2 minutes	Moderate to High
20–60 seconds	Moderate (mid-length period of time)
10–20 seconds	Low to Moderate
Less than 10 seconds	Low (brief period of time)
Source: Energy Commission staff	

Overall Viewer Exposure

Overall viewer exposure is based on *visibility*, *number of viewers*, and *duration of view*. These three variables are generally given equal weight in determining overall viewer exposure. However, additional weight is given to any variable with an extreme value. For example, if a project's visibility is very limited because it would be almost entirely screened from public view, staff gives a lower value to overall viewer exposure.

Overall Visual Sensitivity

Overall visual sensitivity is based on *visual quality*, *viewer concern*, and *overall viewer exposure*. These three variables are generally given equal weight in determining the level of overall visual sensitivity.

VISUAL CHANGE (PROPOSED CONDITION)

The visual change for each KOP is described using the terms *contrast*, *dominance*, and *view blockage*. The scale for rating the visual change ranges from low to high for each variable. The three variables used to evaluate visual change are described below.

Contrast

The degree to which a project could affect the visual quality of a landscape generally depends on the visual contrast created between a project and the existing landscape (U.S. Bureau of Land Management 1986 and 2012). The basic design elements of form, line, color, and texture are used for this comparison and to describe the visual contrast created by a project:

- **Form.** Contrast in form results from changes in the shape and mass of landforms or structures. The degree of change depends on how dissimilar the introduced forms are to those that exist in the landscape.
- **Line.** Contrasts in line results from changes in edge types and interruption or introduction of edges, bands, and silhouette lines. New lines may differ in their subelements (e.g., boldness, complexity, and orientation) from existing lines.

- **Color.** Changes in value, or a gradation or variety of a color (hue) tend to create the greatest contrast. Other factors such as saturation of a color, reflectivity, color temperature, may also increase the contrast.
- **Texture.** Noticeable contrast in texture usually stems from differences in the grain, density, and internal contrast. Other factors such as irregularity and directional patterns of texture may affect the rating.

Projects designed to repeat forms, lines, colors, and textures as those present in the existing landscape will generally be less noticeable. (See also the discussion above under "Visual Absorption Capability.") **Table 3** provides a baseline for the degree of contrast rating.

Table 3
Degree of Contrast and Corresponding Rating

Criteria	Rating
The element contrast demands attention, will not be overlooked, and is dominant in the landscape.	High (strong)
	Moderate to High
The element contrast begins to attract attention and begins to dominate the characteristic landscape.	Moderate
The element contrast can be seen but does not attract attention.	Low to Moderate (weak)
	Low
The element contrast is not visible or perceived.	None
Source: Adapted from U.S. Bureau of Land Management 1986	

Dominance

Dominance is a measure of (a) the proportion of the total field of view that the proposed feature occupies, (b) a proposed feature's apparent size relative to other visible landscape features, and (c) the conspicuousness of the proposed feature due to its location in the view. Also, forms that are bold, regular, solid, or vertical will tend to dominate the landscape.

A proposed feature's level of dominance may be 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 (a) near the center of the view, (b) elevated relative to the viewer, or (c) has the sky as a backdrop. As the distance between a viewer and a feature increases, the feature's apparent size decreases and its dominance decreases as a consequence. The level of dominance is rated from low (subordinate) to high (dominant).

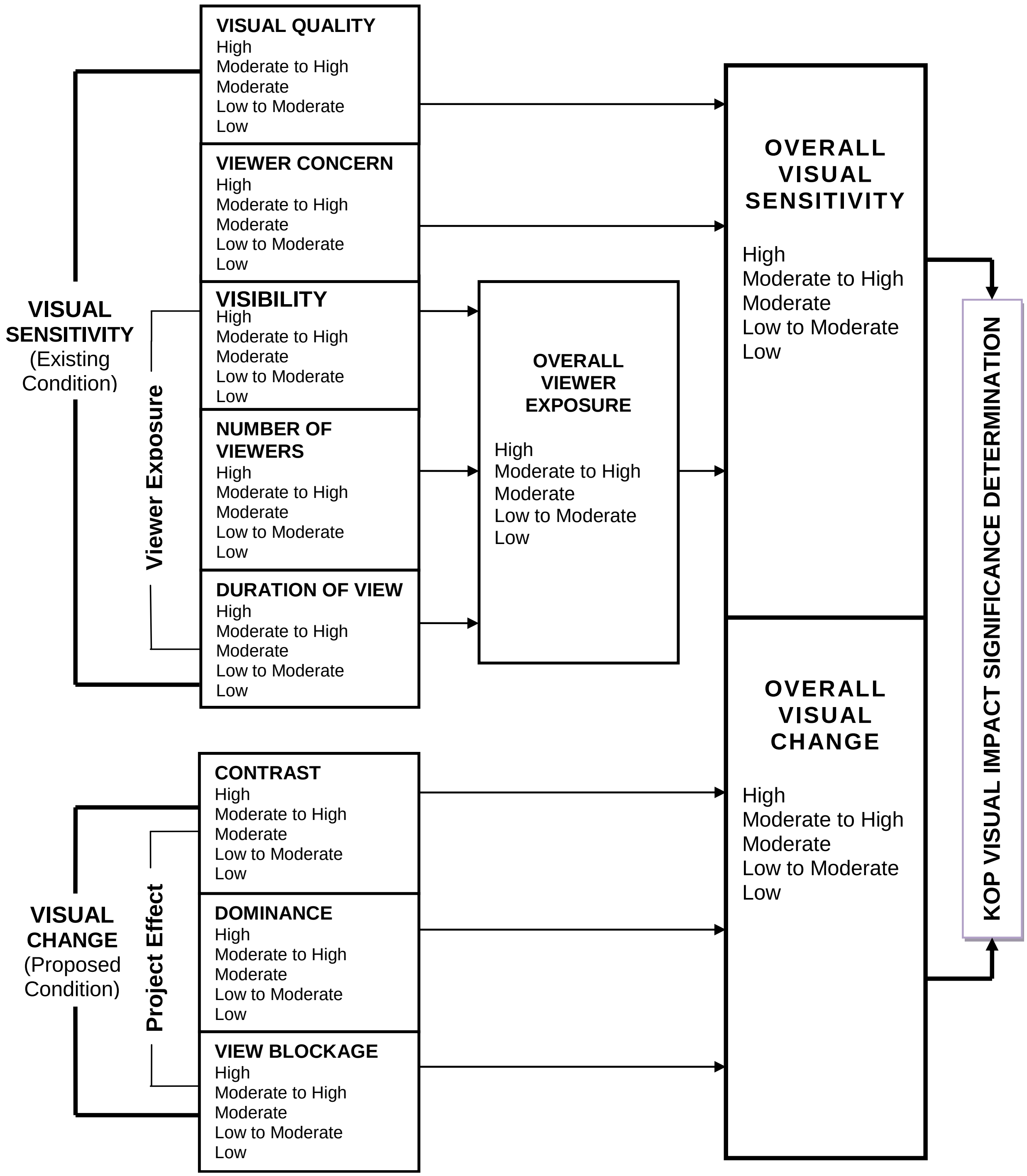
View Blockage

View blockage is the extent to which an existing publicly visible landscape feature (built or natural elements) would be blocked from view by the proposed project. The view is also disrupted when the continuity of the view is interrupted. Higher quality landscape features can be disrupted by the introduction of lower quality features into the view. The degree of view blockage is rated from low to high.

Overall Visual Change

Overall visual change is based on *contrast*, *dominance*, and *view blockage*. These variables are given equal weight in an assessment of overall visual change. Overall visual change is rated from low to high.

VISUAL RESOURCES Diagram 1- Key Observation Point Evaluation



VISUAL IMPACT SIGNIFICANCE DETERMINATION

Visual impact significance is based on the ratings for *overall visual sensitivity* and *overall visual change*. The ratings for overall visual sensitivity and overall visual change are combined to determine significance of the visual impact for each KOP (**Table 4**).

Table 4
KOP Visual Impact Significance Determination

Overall Visual Sensitivity	**Overall Visual Change**				
	High	**Moderate to High**	**Moderate**	**Low to Moderate**	**Low**
High	Significant	Significant	Significant	Less Than Significant	Less Than Significant
Moderate to High	Significant	Significant	Potentially Significant	Less Than Significant	Less Than Significant
Moderate	Significant	Potentially Significant	Less Than Significant	Less Than Significant	Less Than Significant
Low to Moderate	Less Than Significant	Less Than Significant	Less Than Significant	Less Than Significant	No Impact
Low	Less Than Significant	Less Than Significant	Less Than Significant	No Impact	No Impact

Notes:

"Significant effect on the environment" means a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project, including land, air, water, minerals, flora, fauna, ambient noise, and objects of historic or aesthetic significance (Cal. Code Regs., tit. 14, § 15382). Implementation of mitigation measures may or may not avoid the impact or reduce it to a less-than-significant level.

CEQA does not require mitigation for less-than-significant impacts.

PUBLICLY VISIBLE WATER VAPOR PLUMES

When a thermal power generation facility with a cooling tower[1] is operated at times when the ambient temperature is low and relative humidity is high, the warm moisture (water vapor) that is discharged from the cooling tower condenses as it mixes with cooler ambient air, resulting in creation of a visible plume. The publicly visible plume could substantially degrade the existing visual character or quality of the project site and its surroundings, potentially causing a significant impact to visual resources.

Computer modeling is used to estimate the frequency and size of the vapor plume(s) for a power plant project. If the plume modeling analysis results in a conclusion that plume frequency is greater than 20 percent, staff prepares an analysis of the vapor plume's potential effects on visual resources in the VSOI for the project.

[1] Other types of thermal power generation facilities are also sources of visible water vapor plumes, including combined cycle gas turbine exhausts and geothermal steam exhausts. These facilities are evaluated in the same manner as cooling tower plumes.

Staff established a 20th percentile plume frequency during *seasonal* (November through April) *daylight clear* hours (i.e., no rain/fog high visual contrast hours) as a reasonable worst-case scenario. It is during high visual contrast viewing hours ("clear sky") conditions that water vapor plumes show the greatest contrast with the sky. Water vapor plumes emitted during rain and fog conditions and under some cloud conditions (e.g., marine layer) or at nighttime would not introduce substantial visual contrast into the environment. Staff has included in the *clear* category:

a) all hours with sky cover equal to or less than 10 percent, and

b) half of the hours with total sky cover of 20–90 percent.

The rationale for including these two components in this category is as follows:

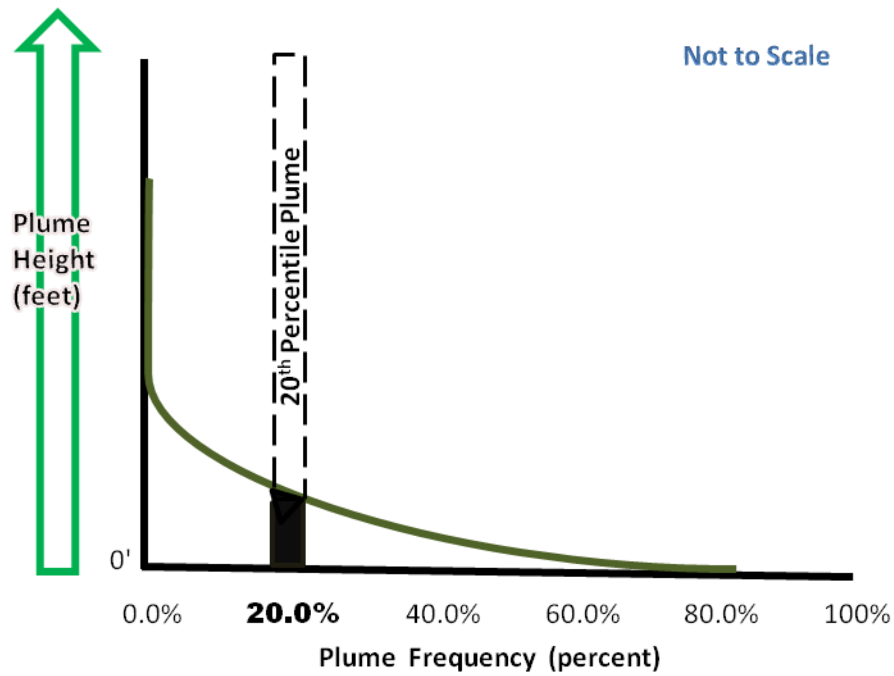
a) Visible plumes typically contrast most with sky under clear conditions, and when total sky cover is equal to or less than 10 percent, clouds either do not exist or they make up such a small proportion of the sky that conditions appear to be virtually clear.

b) For a substantial portion of the time when total sky cover is 20–90 percent, the opacity of sky cover is relatively low (equal to or less than 50 percent), so this sky cover does not always substantially reduce contrast with visible plumes; staff has estimated that approximately half of the hours meeting the latter sky cover criteria can be considered high visual contrast hours and are included in the "clear sky" definition.

Plume frequency is calculated on the 6-month portion of the year when the ambient conditions are such that visible water vapor plumes are most likely to occur. This maximum 6-month "seasonal" period for plume formation generally occurs between November and April when temperatures are cool or cold, and relative humidity is high.

Staff uses the Combustion Stack Visible Plume (CSVP) model to estimate plume frequency and plume size. If the CSVP modeling conducted for the proposed project's cooling tower predicts a *seasonal daylight clear* hour plume frequency of 20 percent or greater, staff evaluates the *20th percentile plume* in the visual resources analysis. (Discussions of visible water vapor plumes are presented in the Visual Resources section of staff assessments.) Staff considers the 20th percentile plume to be the reasonable worst-case plume dimension for the purpose of analysis. Publicly visible plumes that occur more than 20 percent of the time would be more frequent but smaller in size than those that occur less than 20 percent of the time. This approach recognizes that the largest plumes would occur very rarely, while the most frequent plumes and even the average plumes would be much smaller in size. For example, using a scale of 0 to 100, a 1 percentile plume would be extremely large, very noticeable to a wide area, but would occur very infrequently. A 100th percentile plume would be nonexistent (see **Diagram 2** below). If the modeled publicly visible plume is predicted to occur less than 20 percent of seasonal daylight clear hours, the impact to the existing visual character or quality of the project site and its surroundings is generally considered less than significant, and it is not considered further in the visual resources analysis.

Visual Resources Diagram 2 – Visible Plume Height/Frequency Curve



A plume frequency of 20% represents staff's threshold for conducting a detailed plume analysis.

In the evaluation of the visual effects of the modeled 20th percentile plume, staff addresses the *overall visual sensitivity* for the existing condition and the potential *overall visual change* created by the plume's degree of contrast, level of dominance, and view blockage from the selected KOPs (see **Visual Resources Diagram 1**).

PUBLICLY VISIBLE WATER VAPOR PLUME ABATEMENT METHODS

Staff has identified four methods to lower a plume's frequency or eliminate the plume completely.

Increase Cooling Tower Air Flow

Increasing the cooling tower air flow will lower the exhaust temperature and reduce plume frequency but would not eliminate the potential for visible water vapor plumes under all conditions. This method focuses on the design of the cooling tower fan flow capacity versus the amount of heat rejected in the cooling tower. Any specific cooling tower design needs to be fully modeled to determine the effective final plume frequency reductions.

Wet/Dry Cooling Tower

This type of cooling tower reduces plume formation by adding heat or heated ambient air to the saturated wet cooling section exhaust to reduce its saturation level. The saturated exhaust can be heated using a separate dry module above the wet cooling tower. Alternatively, outside air can be pulled into separate areas where a dry section heats the air to reduce humidity and a wet section creates warm, humid exhaust. The heated ambient air and humid exhaust are mixed to reduce the humidity of the combined exhaust steam to avoid creating a plume when meeting ambient air.

The amount of plume reduction that can be accomplished by this type of system can vary from a relatively moderate reduction to a significant reduction in visible plume frequency. The specific wet/dry design would be based on the desired degree of plume reduction.

Wet Surface Air Cooler

The basic operating principle of a wet surface air cooler (WSAC) is rejection of heat by evaporation. The WSAC technology is similar to a wet/dry cooling tower. Where this system is different is that it could eliminate the need for a heat exchanger. The cooling fluid(s) used for the intercooler and any auxiliary cooling systems could be piped directly into the WSAC, which can operate as a non-contact heat rejection system with the use of water sprayed over the cooling pipes to increase the heat rejection when necessary. The expected hot temperature of the cooling fluid would increase the efficiency of this type of system. There may still be the potential for plumes to form under high cooling load periods during certain ambient conditions, but the WSAC could be designed, such as for wet/dry operation depending on cooling load, to maintain a minimal plume frequency well below 20 percent during “clear hours.”

Air Cooled Condenser (Dry Cooling)

The use of an air cooled condenser (ACC) would eliminate the formation of a publicly visible water vapor plume. Air cooled condensers condense exhaust steam from the steam turbine and return condensate to the boiler to perform this function. Steam enters the air cooled condenser above the heat exchangers, flows downward through the heat exchanger tubes, where it condenses and is captured in pipes at the base of the heat exchangers. The condensate is then returned to the boiler water system. Mechanical fans force air over the heat exchangers.

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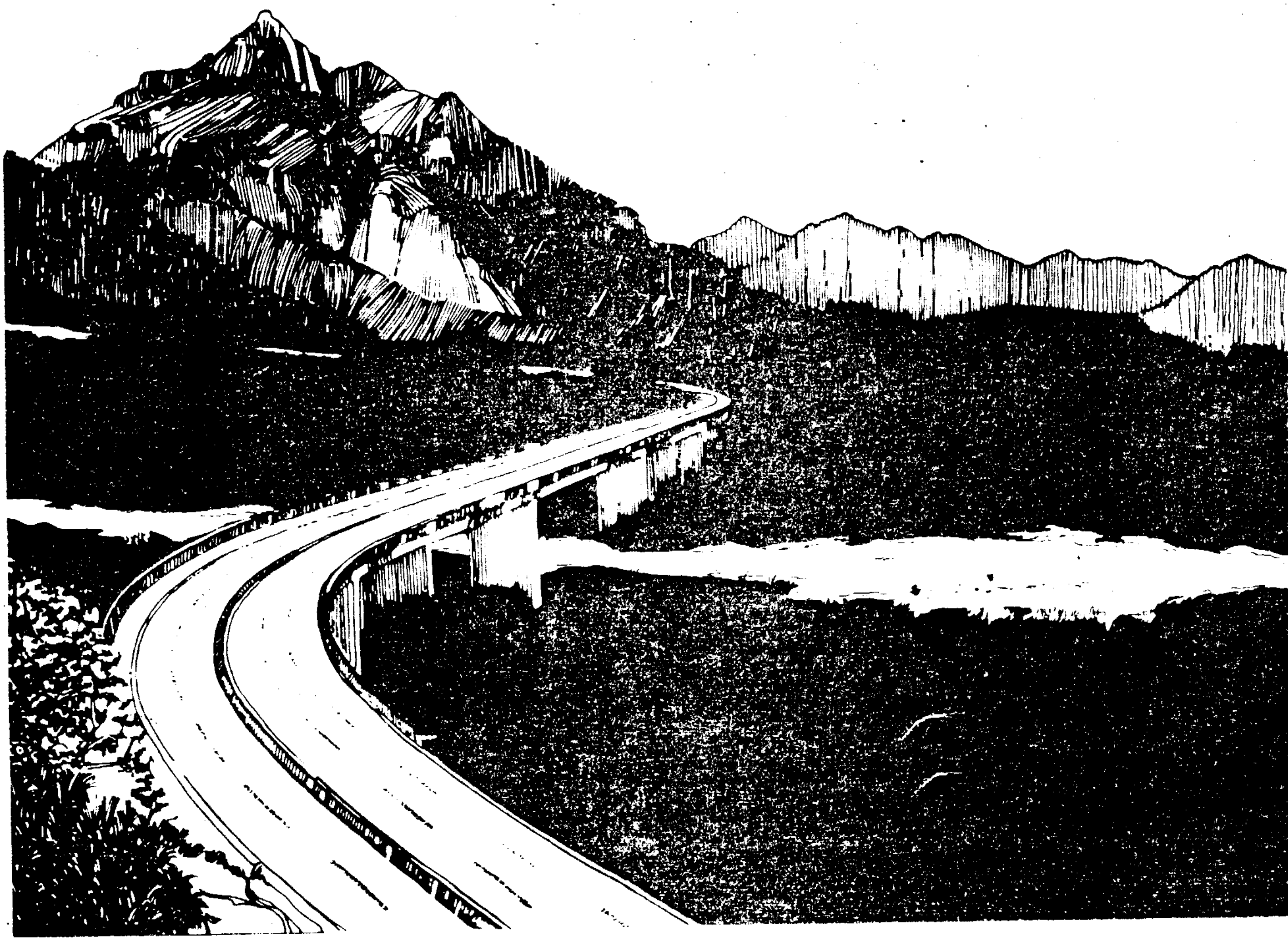
VISUAL RESOURCES APPENDIX-2

U.S. Department
of Transportation

**Federal Highway
Administration**

Office of Environmental Policy

Visual Impact Assessment for Highway Projects



Publication No. FHWA-HI-88-054

U.S. Department
of Transportation
**Federal Highway
Administration**

Visual Impact Assessment for Highway Projects

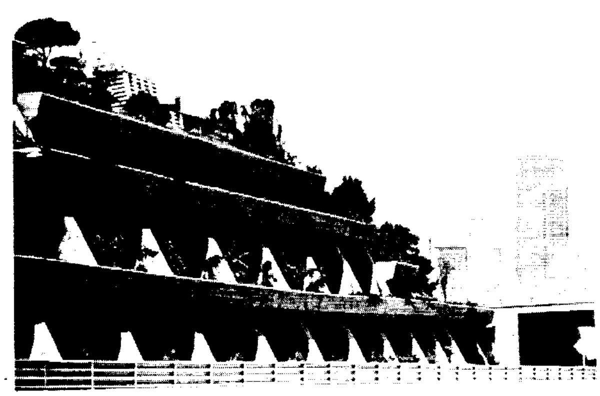
Office of Environmental Policy
Washington, D.C.

(FHWA-HI-88-054)

1 INTRODUCTION

This field guide is intended to help those who prepare or review the coverage of visual impacts in environmental assessments or impact statements for highway projects. This guide will discuss how to develop such coverage and how to review its adequacy.

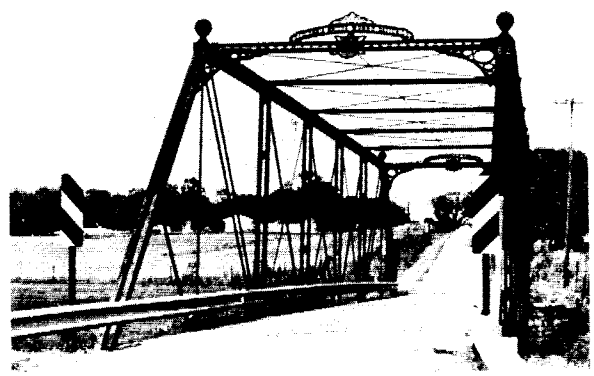
Many State highway agencies have been changing the emphasis of their programs from Interstate construction to the rehabilitation and upgrading of existing roads. It is usually obvious that constructing a new urban freeway will have a significant visual effect, positive or negative, on surrounding areas. It may be less clear whether visual considerations will be important in widening a road or reconstructing a bridge. In fact, experience has shown that visual considerations can sometimes be critical on such projects. This field guide will present an approach to identifying the potential importance of visual effects and then assessing the nature of these effects. Within the framework of this approach, the choice of specific assessment techniques should be tailored to the project in terms of appropriate detail and level of effort. It appears neither necessary nor desirable to apply the elaborate assessment process that is appropriate for a large project to a small project that will have only modest visual effect.



Visual considerations can be a strong influence in the design of major urban highway structures such as this retaining wall.

DOCUMENTING AND REVIEWING VISUAL IMPACTS

A visual impact assessment for a large and controversial highway project may be a considerable undertaking and may require a sizable report to explain the approach and its results. While this report may be a necessary and useful element of the environmental studies for a highway project, it will be too detailed for the Environmental Impact Statement (EIS) itself. The project EIS should be strictly limited in length and should cover only those environmental issues which have a significant bearing on project decisions.



Visual considerations may also be important in deciding how to repair or replace a minor bridge that has historic value.

While the full visual impact assessment report might be included in an EIS appendix, the EIS itself should contain only the findings on significant visual issues and the evidence sufficient to substantiate the findings. Given the limit of 150 pages for a typical EIS," coverage of visual impacts will be limited to a few pages on all but the most controversial projects. The visual assessment information for a finding of no significant impact (FONSI) must also be concise. In both cases, the narrative text should briefly describe the principal visual characteristics of the project, the visual resources and viewers affected, the significance of the main visual issues, the effects of the project alternatives, and any mitigation measures. The scoping procedure suggested in this guide can be useful in the development of this assessment.

Much of the coverage of visual impacts should be graphic; visual effects are best conveyed visually. Graphic exhibits that are particularly helpful include the project viewshed, photographs of key views, and illustrations of the project's effect on these views. Techniques for developing these exhibits are discussed in this field guide.

From a reviewer's perspective, visual impact coverage should contain enough information about the visual characteristics of the project, the people who will view the project, and the visual resources of the project area to support the findings of significance and effect. Evaluations should be supported by factual descriptions and illustrations; for example, an assertion that existing visual resources in the project area are "low in visual quality" should be preceded by a short description of these resources and representative photographs. Proposed mitigation measures should be logically related to adverse visual impacts or offsetting beneficial effects.

The terminology of esthetics is not uniform and reviewers should not insist on the exact words used in this guide (alternative terms in current use are given in the glossary). Rather than look for specific words, reviewers should seek evidence that all the major potential areas of visual impact have been considered. Again, the scoping questionnaire discussed in Chapter Three provides an outline of these areas and may be used as a starting point for review.

WHY VISUAL CONSIDERATIONS ARE IMPORTANT FOR HIGHWAY PROJECTS

The public nature and visual importance of our highways require that visual impacts–positive as well as negative–be adequately assessed and considered when a highway project is developed. Community acceptance of the project may also be strongly influenced by its visual effects.

Project visual impacts are seen both in the view *from* the road and the view *of* the road. The importance of the first has long been recognized. In recreation surveys, Americans have repeatedly ranked pleasure driving on scenic roads as one of their favorite activities. Researchers have also shown that the view from the road is the basis for much of what we know about our everyday environment and for our mental image of the city. For this reason, community groups are rightly concerned with the visual character of the highways entering their town or city; first impressions count.

Americans often drive for the sheer pleasure of the view from the road.

On the other hand, the visual experience of entering our cities can be far from pleasant.

Systematic consideration of the view of the road is more recent. Particularly in urban or suburban areas, there may be many "eyes per mile" along the right-of-way of a proposed project. If existing views are very high in quality or are valued by large numbers of people, the visual costs borne by highway neighbors could outweigh the visual benefits accrued by highway users. In such cases, projects must be carefully planned to ensure that pleasing vistas for travelers are not developed at the expense of views from surrounding areas.

Three Levels of Project Esthetics

NEPA's emphasis on the quality of the overall environment has expanded the context in which we must assess project esthetics. Traditionally, visual design theory has followed the lead of the fine arts by looking at an individual project as a self-contained object, apart from its surroundings. Project esthetics have been judged by considerations like these: does the design visually express the project's functions? are the details visually consistent? do they support the total visual effect? We might summarize these and similar considerations as the *internal esthetics* of a project. This is the first level of project esthetics and is essential to a high-quality visual environment. It is also a principal focus of the Design, Art and Architecture in Transportation program that the U.S. Department of Transportation has instituted.

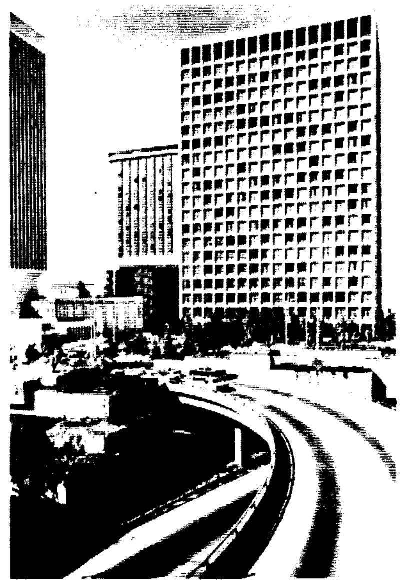
Internal esthetics: Seattle's Freeway Park is a well-detailed and internally consistent design with many delightful, self-contained spaces.

A second level of project esthetics considers the visual relationships between a project and specific elements of its surroundings: does the project contrast strongly?does it block existing views? We might call such considerations *relational* esthetics. They are the visual equivalent of good manners and can be very important to community acceptance of a project.

At the third and broadest level is *environmental* esthetics, to which NEPA particularly directs our attention. Here we must examine the esthetics of the total affected environment, of which any project is only a part: do project visual characteristics, however carefully designed and well mannered, enhance the quality of the environment? decrease it? or even affect it at all?

Relational esthetics: the forms and materials used in Freeway Park are also well-related to the rectilinear urban geometry of the city core.

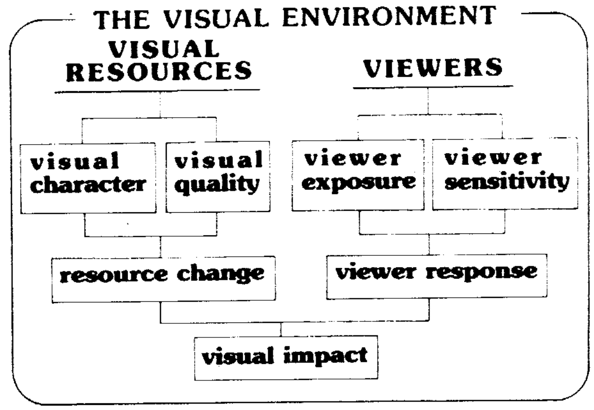
In the past, much more attention has been given to the first level of esthetics than to the second and third levels. For this reason as well as the thrust of NEPA requirements, this guide will emphasize *how to assess visual relationships between highway projects and their surroundings and how to evaluate project effects on the quality of visual experience in the project environment*, as well as the internal esthetics of projects.



Environmental esthetics: the park is also an oasis of green that enhances the quality of the visual environment. It provides a handsome downtown entry and reconciles the differing visual orders of the freeway and the city center.

Visual Assessment Process

A generalized visual impact assessment process is illustrated in the accompanying diagram. This assessment process is similar in broad outline to the visual resource management (VRM) systems employed by several major federal agencies. The major components of this process include establishing the visual environment of the project, assessing the visual resources of the project area, and identifying viewer response to those resources. These components define the existing or baseline conditions. We can then assess the resource change that would be introduced by the project and the associated viewer response; these allow us to determine the degree of visual impact.



These are the principal issues that a visual impact assessment should address; the relative importance of these issues will change from project to project.

3 SCOPING THE VISUAL IMPACT ASSESSMENT

SCOPING VISUAL IMPACTS

This guide has already shown that there are many different types of visual issues. For a few major projects, we may have to address all of them, but we need not adopt an "all or nothing" approach to visual impact assessment. Instead, we can apply the scoping concept to visual impacts and identify which visual issues, if any, require analysis for a given project. This chapter presents an "open question" approach for identifying significant visual issues. The questionnaire presented here can be used to help scope an EIS; it can also be used to guide the preparation of environmental assessments or to help identify the "extraordinary circumstances" under which environmental review is advisable for an otherwise excluded action. The questions, when properly analyzed, can serve as the primary basis upon which an esthetic or visual impact analysis can be written. They address those factors and esthetic considerations which are necessary in the development of an acceptable visual impact analysis. Although the questions can be self-serving in the visual impact assessment process, the remaining chapters in this field guide provide an explanation of the principles, evaluation techniques, and basic concerns which should be followed in analyzing the questions.

The questions are grouped under five main headings, discussed in the following paragraphs.

1 Project Characteristics

The first set of questions calls attention to project characteristics that may have a significant effect on project appearance. Alternatives may involve changes in these characteristics. For instance, a viaduct structure may be an alternative to a massive fill section across a low-lying area.

2 Visual Environment of Project

The next set of questions helps to identify and differentiate the visual environment of the project within the meaning of "affected environment" and "human environment" defined in NEPA regulations. The questions are intended to clarify the need for detailed analysis such as viewshed mapping.

3 Significant Visual Resource Issues

We can often identify the nature and likelihood of significant visual resource effects before we perform a detailed visual impact assessment. Sometimes visual resource effects are significant in themselves. For example, high visual quality is generally worth conserving wherever it exists. In most cases, however, the significance of these resource effects must be interpreted in combination with viewer response (the next set of questions).

For instance, the visual quality of an urban residential district may not be very high, but local residents may still value its visual character. On the other hand, highway projects are often related to urban improvement and redevelopment proposals; in these cases, community groups may be very concerned about improving the visual quality of urban travel routes by facility design and even the appropriate incorporation of art.

4 Significant Viewer Response Issues

Often, we can also identify the general nature of viewer response to a project before we undertake a detailed visual assessment, although the values and goals of local viewer groups may not become fully apparent until later in the process. For example, we can safely predict that residential and recreational viewer groups will be concerned about the appearance of their visual environment. We also know that various federal laws and regulations impose what we may call the test of visual compatibility on projects located close to visual resources that are recognized for their cultural significance. Where this recognition is based on "scenic values," effects on visual quality will be equally important.

5 *Visual Impacts and Impact Management*

The last group of questions is intended to summarize the major visual effects–adverse or beneficial–that are likely to be associated with project alternatives. It is also intended to help identify potential visual mitigation measures for study in the assessment process. Mitigation can include avoiding, minimizing, and reducing impacts, as well as rectifying them or compensating for them. A mitigation measure should be related to a specific impact, or it may not only be ineffective, but may also compound the problem. For example, a color chosen to enhance the appearance of a bridge may prove incompatible with the surroundings of the bridge.

THE PROJECT VIEWSHED

The regional landscape establishes the general visual environment of a project. We can determine the precise limits of the visual environment by mapping the project *viewshed.* A viewshed is the surface area visible from a given viewpoint or series of viewpoints; it is also the area from which that viewpoint or series of viewpoints may be seen. Put another way, a viewshed is a tool for identifying the views that a project could actually affect. Viewshed mapping can go far to dispel exaggerated community fears over the visual effects of a project by accurately establishing which views have any potential of being affected. The extent of these views is often less than expected by the public. On the other hand, judgment must be exercised as to whether the area of assessment should extend to the farthest limits of the viewshed.

When a project involves location alternatives, each alternative may have its own viewshed. Often, these alternative viewsheds will include different landscape units. If the alternatives are all in the same valley, however, their viewsheds may be very similar. In such cases, as well as on existing roads, it can be useful to combine landscape unit and viewshed boundaries to define *visual assessment unit* as the visible portions of the landscape units through which the highway passes. Utilizing these composite units for evaluating and managing visual effects will help us limit our effort to the areas from which the highway may actually be seen. This approach is particularly well-suited for upgrading a road on its present location.

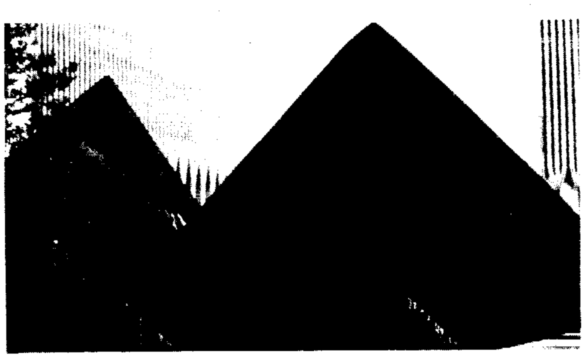
VISUAL CHARACTER

We do not simply experience the visual environment one object at a time: we experience the visual environment as an integrated whole. Our visual understanding or cognition of that environment is based on the *visual character* of objects and the relationships between these objects. The assessment of visual character is descriptive and not evaluative; that is, it is based on defined attributes that are neither good nor bad in themselves. Nevertheless, there can be strong public preference for the established visual character of a district and strong resistance to a project that would contrast with that character.

Descriptions of visual character can distinguish at least two levels of attributes: pattern elements and pattern character. Visual *pattern elements* are primary visual attributes of objects; they include form, line, color, and texture. The *form* of an object is its visual mass, bulk, or shape. *Line* is introduced by the edges of objects or parts of objects. The *color* of an object is both its value or reflective brightness (light, dark) and its hue (red, green). *Texture* is apparent surface coarseness. Our awareness of these pattern elements varies with distance. From afar, only the largest objects are seen as individual forms and we may see a city hillside as a textured surface. Distance also attenuates the intensity of colors.

The visual relationships between these pattern elements can be important secondary visual attributes of an object or an entire landscape. For example, there is a great difference between the visual character of a two-lane country road and an eight-lane freeway, although both may exhibit similar line, color, and texture. The visual contrast between a highway project and its visual environment can frequently be traced to four aspects of *pattern character:* dominance, scale, diversity, and continuity.

Specific components in a landscape may be visually *dominant* because of position, extent, or contrast of basic pattern elements. *Scale* is the apparent size relationship between a landscape component and its surroundings; an object can be made to look smaller or larger in scale by manipulating its visual pattern elements. Visual *diversity* is a function of the number, variety, and intermixing of visual pattern elements. *Continuity* is the uninterrupted flow of pattern elements in a landscape and the maintenance of visual relationships between immediately connected or related landscape components.



Visual character: form is the most prominent pattern element in this man-made setting.

The horizontal line of this fresh highway cut contrasts with the characteristic diagonal lines in the natural landscape.

VISUAL QUALITY

Esthetics is concerned not only with the character of visual experience, but also with its excellence. Where it exists, this excellence has both viewer and visual resource dimensions. The enjoyment or interpretation of experience can have many preferential and subjective components, yet there is clear public agreement that the visual resources of certain landscapes have high *visual quality* and that plans for projects in these areas should therefore be subject to careful examination.

On the level of visual information or visual character, such landscapes may have little in common. For instance, high visual quality is recognized in urban landscapes such as the New York skyline, as well as in natural landscapes such as the Grand Tetons. Both of these exhibit striking vertical relief, yet horizontal landscapes such as Cape Cod are also recognized for their high quality. Visual quality has often been tied to water, always nearby on Cape Cod, but desert landscapes such as Bryce Canyon are also noted for visual quality. Because of these differences in the character of the visual environment, a project in an area with high visual quality does not always have an adverse effect on that visual quality. How do we establish which landscapes have high visual quality and what is its basis?

Approaches to Assessing Visual Quality

Pragmatic approaches to answering these questions start with the recognition that Americans agree on the high visual quality of many landscapes. Some of these places are already officially designated–national parks and scenic rivers, for example. This may be considered proof of high visual quality, and a first approach to establishing the visual quality of a project area is simply to check for designated scenic areas. However, there is no comprehensive official process for identifying areas of high visual quality, nor does NEPA allow us to consider only superlative environments.

A second approach is to ask project viewer groups their visual preference for the principal landscape types in the project area. This approach has the virtue of directness and can avert challenge based on the potential difference between professional judgment and public opinion. However, it can also have its difficulties, including time, cost, and statistical validity, particularly when there are strong differences in values between local and regional viewer groups. Viewer preference techniques can be very useful for identifying areas to avoid during project location, but are not as helpful for devising and evaluating mitigation measures for areas the project cannot avoid crossing.

A third approach, used by several federal land-managing agencies, looks to the regional landscape for specific resource indicators of visual quality. High quality ratings are assigned to those landscape units which most clearly or dramatically exhibit the natural processes characteristic of the geographic region. Resource indicators of visual quality may be on the level of visual information (e.g., rock faces, avalanche cones) or visual character (e.g., variety). This approach has primarily been used for settings that are natural in appearance. It also tends to presume a region-wide visual analysis as a starting point and may be difficult to implement on a project-by-project basis.

A fourth approach to the evaluation of visual quality looks for indicators on the level of visual relationships rather than on the level of landscape components. A number of such relationships correlate well enough with public judgments of visual quality to predict those judgments. In other words, professionals can use these relationships as valid and reliable criteria for evaluative appraisals of visual quality. These criteria can be used within different geographic regions, as long as direct comparisons of visual quality are kept within the same region.

Vividness, Intactness, Unity

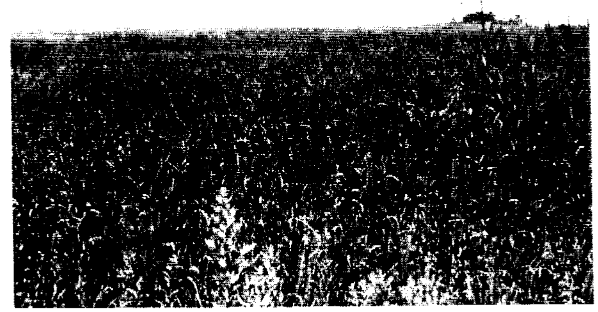
Several sets of evaluative criteria have been proposed and tested. One set that has proven useful includes three criteria: vividness, intactness, and unity. None of these is itself equivalent to visual quality: all three must be high to indicate high quality. *Vividness* is the visual power or memorability of landscape components as they combine in striking and distinctive visual patterns: Niagara Falls is a good instance. *Intactness* is the visual integrity of the natural and man-built landscape and its freedom from encroaching elements: this factor can be present in well-kept urban and rural landscapes, as well as in natural settings. *Unity* is the visual coherence and compositional harmony of the landscape considered as a whole: it frequently attests to the careful design of individual components in the landscape.

This evaluation approach can be particularly useful for highway project planning, since it does not simply presume that a highway project is an eyesore. It can also help identify effective ways of reducing specific adverse visual resource effects that are actually likely to occur.

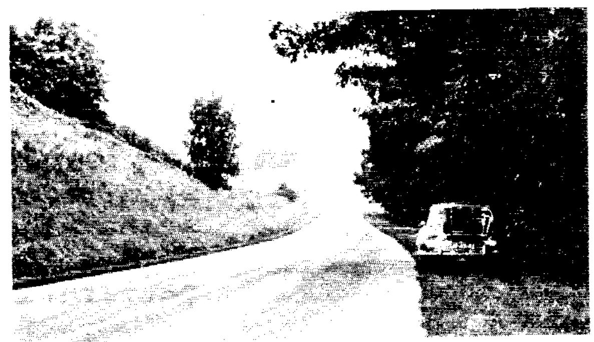
Whatever the approach to the evaluation of visual quality, direct validation by project viewer groups should be obtained whenever possible. Public opinion on visual quality issues can be included in the normal community involvement program. A full representative and random sample is generally not necessary: the point is to ensure that the assessors and the general public are on the same track. Some form of public participation, and validation of professional judgment, may be particularly important where legal challenge is a possibility.

We have identified the major factors in our experience of the visual environment and are now ready to examine some of the ways in which a highway project can affect this experience.

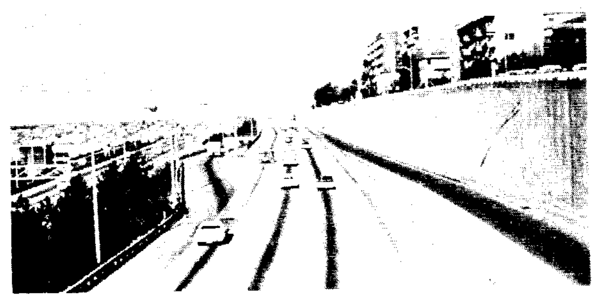
Visual quality: vividness or memorability is one of several criteria that can be used to help evaluate the visual quality of natural and manmade landscapes: the Manhattan skyline rates high on this criterion.



While the visual intactness and unity of this farm scene are both quite high, its overall visual quality is somewhat lower because it is not highly vivid.



A highway may also improve visual quality if it increases the unity and visual harmony of a landscape.



Large urban highways may disrupt the visual intactness of their city settings, lowering visual quality for highway neighbors.

Rio de Janeiro is a city recognized around the world for its high visual quality: the vivid combination of natural and urban forms, including transportation, is also characterized by high visual intactness of component elements and high visual unity in views such as this.

5 CHARACTERISTICS OF VIEWERS

Visual experience is a compound of visual resources and viewer response. To understand and predict viewer response to the appearance of a highway projects, we must know something about the viewers who may see the project and the aspects of the visual environment to which they are likely to respond. Vision is an active sense: we usually have some reason for looking at the landscape and what we see is unconsciously conditioned by what we are looking for. How we feel about what we see is conditioned by other human factors: many of these are shared among large groups of people and may be important for project planning.

Viewer Groups and Viewer Exposure

Visual perception is the basic act of seeing or recognizing an object. Naturally, we assume an unobstructed sightline, but other physical conditions can also affect perception. As observer distance increases, the ability to see the details of an object decreases. As observer speed increases, the sharpness of lateral vision declines and the observer tends to focus along the line of travel.

We can differentiate major *viewer groups* by physical factors that modify perception. For highway projects, we begin with the basic distinction of the view from the road (highway users) and the view of the road (highway neighbors). We can use viewshed mapping to further categorize these viewer groups by *viewer exposure:* the physical location of each viewer group, the number of people in each group, and the duration of their view.

Viewer Sensitivity

The receptivity of different viewer groups to the visual environment and its elements is not equal. This variable receptivity is *viewer sensitivity* and is strongly related to visual preference. It modifies visual experience directly by means of viewer activity and awareness: indirectly, sensitivity modifies experience by means of values, opinions, and preconceptions. High viewer sensitivity can be critical to project planning and design because it heightens viewer response and increases the importance of visual resource issues. In a few cases, high viewer sensitivit, may tend to discourage any visible change to the project environment.

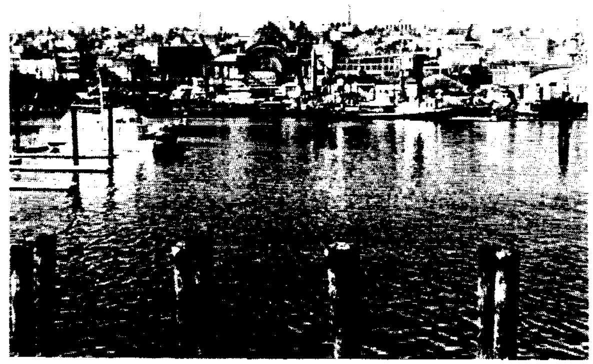
Activities such as commuting in heavy traffic or working on a construction site can distract an observer from many aspects of the visual environment. Head-mounted cameras, for instance, have demonstrated that a driver can look directly at a landmark and still not see it. On the other hand, activities such as driving for pleasure or relaxing in scenic surroundings can encourage an observer to look at the view more closely and at greater length. Therefore, *viewer activity* is another identifying characteristic of viewer groups.

This dramatic mountain gateway heightens the visual awareness of highway travelers.

For example, we may well want to distinguish among project viewers located in residential, recreational, and industrial areas.

Viewer awareness is the extent to which the receptivity of viewers is heightened by the immediate experience of visual resource characteristics. Visual change heightens awareness: a landscape transition, such as entering a mountain range or a major city, may heighten viewer awareness for a number of miles along a road. Measures that modify viewer exposure, such as selective clearing or screening, may also be deliberately employed to modify viewer awareness. For example, we well may want to distinguish among project viewers located in residential, recreational, and industrial areas.

Local values and goals operate indirectly on viewer experience by shaping view expectations, aspirations and appreciations. If the existing appearance of a project site is uninspiring, a community may still object to projects that fall short of its visual goals. At a regional or national level, viewers may be particularly sensitive to the visual resources and appearance of a particular landscape as a result of its *cultural significance*. This significance may be due to the presence of historic values, scientific or recreational resources, or other unique features: any visible evidence of change may be seen as a threat to these values or resources.



An elevated highway would traverse the unsightly industrial area on the other side of this waterway. Nevertheless, there has been strong public concern over the visual effects of the highway on future redevelopment and on the historic railroad station in the middle distance.

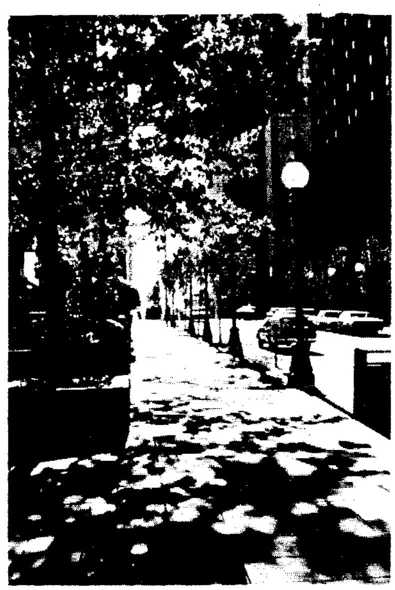
VISUAL QUALITY

One important indicator of the public concern a project is likely to generate is the visual quality of its landscape setting. Highway projects in landscapes with high visual quality are likely to receive close scrutiny. In certain classes of lands, areas with high visual quality are singled out for special consideration in highway project planning. These classes include "4(f) lands" (public parks, recreation areas, wildlife and waterfowl refuges, and historic sites) and lands associated with the National Wild and Scenic Rivers System. On other lands managed for their resource values, special management attention is paid to all types of development in areas with high visual quality; these lands include those managed by the U.S. Forest Service and the Bureau of Land Management. Where visual quality is high, we may have to carefully consider the visual effects of relatively simple projects, such as straightening a rural trunk highway and widening its shoulders.

When this trunk road to a wilderness canoe area is upgraded, its alignment will be adjusted to preserve several large "sentinel pines".

Low visual quality does not necessarily mean there will be no concern over the visual effects of a project, however. In instances such as urban entry roads, communities may ask that highway projects help improve existing visual quality. The DOT Design, Art, and Architecture in Transportation program supports such requests by emphasizing the consideration of the design arts in projects with high public visibility or use. In other words, improvements to the visual quality of everyday environments deserve consideration just because these environments are experienced so frequently by so many people. Streets and highways are major public investments and attention to their design quality can do much to raise visual quality around them.

Highway projects may affect the visual quality of an area by displacing attractive visual resources—or adding them. The "esthetic additive" approach was taken in the Highway Beautification program but proved vulnerable to budget cuts and maintenance reductions. Moreover we have seen that visual quality is often due to the visual relationships among all components of a landscape, rather then the presence of a single preferred feature. As we discussed in Chapter Four, explicit evaluative criteria may be used to appraise these relationships.



This major urban streetscape project widened travel lanes and sidewalks by removing curbside parking. A principal visual objective was also to unify the diverse commercial architecture along the street by the use of consistent color, texture, and scale in paving and "street furniture".

Vividness, intactness, and unity are three criteria that have proven to be effective indicators of visual quality. Visually successful projects usually achieve a balance among all three; too frequently, design emphasis is placed on one of these criteria at the expense of the other two.

For example, a pedestrian mall can be "oversized" and made so vivid that it is out of character with the surrounding urban environment and detracts from visual unity. This example is not meant to indicate that vivid contrast always causes an adverse effect on visual quality. The bridges of the Swiss engineer Maillart exhibit vivid form and color, but also maintain the visual intactness of their mountain settings and achieve strong visual unity with those settings. In many urban settings, however, the number and variety of existing manmade forms suggest that enhancing overall visual unity may be a more effective approach to improving visual quality than attempting to introduce vivid new forms into the setting. For example, an urban arterial improvement and streetscape project may deliberately understate individual design elements such as street lights, traffic signals, and paving patterns.

VISUAL RESOURCES APPENDIX-3

Visual Resources Appendix-3 – Key Observation Point Evaluation Matrix and Visual Impact Determination Conclusions

KOP	Visual Sensitivity (Existing Condition)							Visual Change (Proposed Condition)				Visual Impact Determination
	Visual Quality	Viewer Concern	Viewer Exposure: Visibility	Viewer Exposure: Number of Viewers	Viewer Exposure: Duration of View	Viewer Exposure: Overall Viewer Exposure [1]	Overall Visual Sensitivity [2]	Contrast	Dominance	View Blockage	Overall Visual Change [3]	Overall Visual Sensitivity + Overall Visual Change [4]
1 – View from Huntington State Beach	Low	High	High	High	High or Moderate to High	High	Moderate to High	Low to Moderate	Low	Low	Low	**Less Than Significant**
2 – View from Huntington Beach Municipal Pier	Moderate to High	High	Moderate	High	High	Moderate to High	Moderate to High	Low to Moderate	Low to Moderate	Low	Low to Moderate	**Less Than Significant**
3 – View from Edison Community Park	Moderate	High or Moderate to High	Moderate	Moderate to High	Moderate to High	Moderate to High	Moderate to High	Low to Moderate	Low to Moderate	Low	Low to Moderate	**Less Than Significant**
4 – View from Magnolia Street near the PCH	Low to Moderate	High	High	High	Moderate to High	High	Moderate to High	Moderate	Moderate	Low to Moderate	Moderate	**Potentially Significant**
5 – View from the Driveway Entrance to the Huntington By-The-Sea Mobile Estates and RV Park	Low	High	High	High	Moderate to High	High	Moderate to High	Moderate to High	Moderate to High	Moderate	Moderate to High	**Significant**

Visual Resources Appendix-3 – Key Observation Point Evaluation Matrix and Visual Impact Determination Conclusions													
KOP	**Visual Sensitivity (Existing Condition)**								**Visual Change (Proposed Condition)**				**Visual Impact Determination**
	Visual Quality	Viewer Concern	Viewer Exposure: Visibility	Viewer Exposure: Number of Viewers	Viewer Exposure: Duration of View	Viewer Exposure: Overall Viewer Exposure [1]	Overall Visual Sensitivity [2]		Contrast	Dominance	View Blockage	Overall Visual Change [3]	Overall Visual Sensitivity + Overall Visual Change [4]
6 – View from the PCH near Brookhurst Street	Moderate	Moderate to High or High	Moderate to High	High	Moderate to High	Moderate to High	Moderate to High		Low to Moderate	Low to Moderate	Low	Low to Moderate	**Less Than Significant**
7 – View from the Southern Bluff of the Huntington Beach Mesa	Moderate	High	Low to Moderate	Moderate to High or High	High	Moderate to High	Moderate to High		Low	Low	Low	Low	**Less Than Significant**

Notes: High = 5 Moderate to High = 4 Moderate = 3 Low to Moderate = 2 Low = 1

[1] Visibility + Number of Viewers + Duration of Views ÷ 3 = **Overall Viewer Exposure**

[2] Visual Quality + Viewer Concern + Overall Viewer Exposure ÷ 3 = **Overall Visual Sensitivity**

[3] Contrast + Dominance + View Blockage ÷ 3 = **Overall Visual Change**

[4] Overall Visual Sensitivity + Overall Visual Change = **Visual Impact Determination** (see Table 4 in Visual Resources Appendix-1)

VISUAL RESOURCES APPENDIX-4

APPLICABLE LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

In the table below, verbatim text is provided for laws, ordinances, regulations and standards (LORS) that are applicable to visual resources for the Huntington Beach Energy Project. **VR Table 2** in the **Visual Resources** section of this staff assessment summarizes these LORS and addresses their consistency with the proposed project.

In some instances, parts of sections of the cited ordinance that are inapplicable to the proposed project are left out, as indicated below when the numbering for objectives and policies is nonconsecutive or when an ellipsis is used in the text.

VR Appendix-4
Laws, Ordinances, Regulations, and Standards Applicable to Visual Resources

Sources and Goals; Chapters and Sections	Objectives, Policies, and Standards
California Coastal Act of 1976	
Section 30251 – Scenic and visual qualities	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 areas. New development in highly scenic areas such as those designated in the California Coastline Preservation and Recreation Plan prepared by the Department of Parks and Recreation and by local government shall be subordinate to the character of its setting.
City of Huntington Beach General Plan	
Land Use Element	
Goal LU 4 – Achieve and maintain high quality architecture, landscape, and public open spaces in the City	• Objective LU 4.1 Promote the development of residential commercial, industrial, and public buildings and sites that convey a high quality visual image and character. ○ Policy LU 4.1.2 Require that an appropriate landscape plan be submitted and implemented for development projects subject to discretionary review. ○ Policy LU 4.1.3 Require property owners to maintain landscaping, remove and abate weeds, and replace unhealthy or dead landscape. ○ Policy LU 4.1.4 Encourage developers to incorporate mature and specimen trees and other significant vegetation, as defined by the City, that may exist on a site into the design of a development project for that site.

VR Appendix-4
Laws, Ordinances, Regulations, and Standards Applicable to Visual Resources

Sources and Goals; Chapters and Sections	Objectives, Policies, and Standards
Goal LU 13 – Achieve the development of a mix of governmental service, institutional, educational, and religious uses that support the needs of Huntington Beach's residents	○ Policy LU 13.1.8 Ensure that the City's public buildings, sites, and infrastructure improvements are designed to be compatible in scale, mass, character, and architecture with existing buildings and pertinent design characteristics prescribed by this General Plan for the district or neighborhood in which they are located, and work with non-City public agencies to encourage compliance.
Urban Design Element	
Goal UD 1 – Enhance the visual image of the City of Huntington Beach	○ Policy UD 1.2.1 Require public improvements to enhance the existing setting for all key nodes and pedestrian areas through the consideration of the following: ▪ f. Incorporate landscaping to mask oil operations and major utilities, such as the Edison generating station.
Goal UD 2 – Protect and enhance the City's public coastal views and oceanside character and screen any uses that detract from the City's character	• Objective UD 2.1 Minimize the visual impacts of new development on public views to the coastal corridor, including views of the sea and the wetlands. ○ Policy UD 2.1.1 Require that new development be designed to consider coastal views in its massing, height, and site orientation. • Objective UD 2.2 Minimize the visual impacts of oil production facilities and other utilities where they encroach upon view corridors or are visually incompatible with their surrounding uses. ○ Policy UD 2.2.1 Require landscape and architectural buffers and screens around oil production facilities and other utilities visible from public rights-of-way. ○ Policy UD 2.2.4 Require the undergrounding of utility lines. ○ Policy UD 2.2.5 Require the review of new and or expansions of existing industrial and utility facilities to ensure that such facilities will not visually impair the City's coastal corridors and entry nodes.[1]

[1] A "node" is defined as a significant focal point, such as a street intersection that acts as a center of movement and activity. The City of Huntington Beach identifies secondary entry nodes, including Newland Street (along the west side of the HBEP site) and Magnolia Street (near the east side of the HBEP site) where they intersect with the Pacific Coast Highway.

VR Appendix-4
Laws, Ordinances, Regulations, and Standards Applicable to Visual Resources

Sources and Goals; Chapters and Sections	Objectives, Policies, and Standards
Circulation Element	
Goal CE 8 – Maintain and enhance visual quality and scenic views along designated scenic corridors	• Policy CE 8.1 Protect and enhance viewsheds along designated scenic corridors. • Policy CE 8.7 Require that development projects adjacent to a designated scenic corridor include open spaces, plazas, gardens, and/or landscaping that enhance the corridor and create a buffer between the building site and the roadway. • Policy CE 8.11 Continue to locate new and relocated utilities underground within scenic corridors to the greatest extent possible. All other utility features shall be placed and screened to minimize visibility.
Utilities Element	
Goal U 5 – Maintain and expand service provision to City of Huntington Beach residences and businesses	○ Policy U 5.1.4 Require the review and or expansions of existing industrial and utility facilities to ensure that such facilities will not visually impair the City’s coastal corridors and entry nodes.
Environmental Resources / Conservation Element	
Goal ERC 4 – Maintain the visual quality of the City’s natural land forms and water bodies	• Objective ERC 4.1 Enhance and preserve the aesthetic resources of the City, including natural areas, beaches, bluffs and significant public views. ○ Policy ERC 4.1.5 Promote the preservation of public view corridors to the ocean and the waterfront through strict application of local ordinances, design guidelines and related planning efforts, including defined view corridors.
Goal ERC 5 – Conserve the natural environment and resources of the community for the long-term benefit and enjoyment of its residents and visitors	○ Policy ERC 5.2.3 Require that the use of energy saving designs and materials be incorporated into the construction of all public buildings, while encouraging their use City-wide.
Coastal Element	
Goal C 4 – Preserve and, where feasible, enhance and restore the aesthetic resources of the City’s coastal zone, including natural areas, beaches, harbors, bluffs, and significant public views	• Objective C 4.1 Provide opportunities within the Coastal Zone for open space as a visual and aesthetic resource. ○ Policy C 4.1.1 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 public views to and along the ocean and scenic coastal areas. ○ Policy C 4.1.4 Preserve skyward, night time views through minimization of lighting levels along the

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<tr><th>Sources and Goals;
Chapters and Sections</th><th>Objectives, Policies, and Standards</th></tr>
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shoreline.

• Objective C 4.2 Promote the protection of the Coastal Zone’s visual and aesthetic resources through design review and development.

o Policy C 4.2.1 Ensure that the following minimum standards are met by new development in the Coastal Zone as feasible and appropriate:
a) Preservation of public views to and from the bluffs, to the shoreline and ocean and to the wetlands.
b) Adequate landscaping and vegetation.
c) Evaluation of project design regarding visual impact and compatibility.
d) Incorporate landscaping to mask oil operations and major utilities, such as the electrical power plant on the Pacific Coast Highway.

o Policy C 4.2.2 Require that the massing, height, and orientation of new development be designed to protect public coastal views.

o Policy C 4.2.3 Promote the preservation of significant public view corridors to the coastal corridor, including views of the sea and the wetlands through strict application of local ordinances, design guidelines and related planning efforts, including defined view corridors.

• Objective C 4.6 Enhance the visual appearance of the Coastal Zone through the development and implementation of landscaping standards.

o Policy C 4.6.3 For new re-development, require the preservation of existing mature trees (as defined by the City’s Landscape Ordinance). If preservation of existing mature trees is not feasible, require that removed trees be replaced at a minimum 2:1 ratio either on site, or elsewhere within the Coastal Zone, as prescribed by the City.

• Objective C 4.7 Improve the appearance of visually degraded areas within the Coastal Zone.

o Policy C 4.7.1 Promote the use of landscaping material to screen uses that detract from the scenic quality of the coast along public rights-of-way and within public view.

o Policy C 4.7.2 Continue to locate new and relocated utilities underground when possible. All others shall be
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VR Appendix-4
Laws, Ordinances, Regulations, and Standards Applicable to Visual Resources

Sources and Goals; Chapters and Sections	Objectives, Policies, and Standards
	placed and screened to minimize public viewing. ○ Policy C 4.7.5 Require the review of new and/or expansions of existing industrial and utility facilities to ensure that such facilities will not visually impair the City's coastal corridors and entry nodes. ○ Policy C 4.7.8 Require landscape and architectural buffers and screens around oil production facilities and other utilities visible from public rights-of-way.
Goal C 8 – Accommodate energy facilities with the intent to promote beneficial effects while mitigating any potential adverse impacts	• Objective C 8.4 Minimize the safety and aesthetic impacts of resource production facilities on non-resource production land uses. ○ Policy C 8.4.2 Encourage the owners of the electric generating plant located on Pacific Coast Highway to provide landscaping and other measures to buffer and screen the power plant from Pacific Coast Highway and Beach Boulevard. Require any power plant expansion or alteration proposals to include adequate buffer and screening measures.
Huntington Beach Zoning & Subdivision Ordinance	
Title 21 – Base Districts	
Chapter 214, PS Public-Semipublic District; Section 214.08 PS District – Development Standards	• Minimum site landscaping – 8 percent ○ Additional Development Standards: (F) Planting Areas: (2) A 10-foot-wide landscaped strip shall be provided along all street frontages, except for necessary driveways and walks. (G) References Chapter 232: Landscape Improvements *(see below)* (N) In the coastal zone, the maximum allowable height of structures shall be reduced as necessary to retain compatibility with the established physical scale of the area and to preserve and enhance public visual resources.
Title 22 – Overlay Districts	
Chapter 221, Coastal Zone Overlay District; Section 221.10 Requirements for New Development Adjacent to Resource Protection Area	As a condition of new development adjacent to a resource protection area, which includes any wetland, Environmentally Sensitive Habitat Area (ESHA), associated buffers, land zoned Coastal Conservation, as the same are defined in the City's Local Coastal Program, an applicant shall comply with the requirements listed below. These requirements shall be applicable to all lots within new subdivisions as well as development proposed on

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Laws, Ordinances, Regulations, and Standards Applicable to Visual Resources

Sources and Goals; Chapters and Sections	Objectives, Policies, and Standards
	existing lots within and/or adjacent to resource protection areas. • A. Landscape Plan shall be prepared that prohibits the planting, naturalization or persistence of invasive plants, and encourages low-water-use plants, and plants primarily native to coastal Orange County of local stock. • G. Visual impacts created from any walls or barriers adjacent to open space conservation and passive recreational use areas shall be minimized through measures such as open fencing/wall design, landscape screening, use of undulating or off-set wall features, etc. • H. Walls, fences, gates and boundary treatments shall use wood, wrought iron, frosted or partially-frosted glass or other visually permeable barriers that are designed to prevent creation of a bird strike hazard. Clear glass or Plexiglass shall not be installed unless appliqués (e.g., stickers/decals) designed to reduce bird strikes by reducing reflectivity and transparency are also used.
Chapter 221, Coastal Zone Overlay District; Section 221.14 Preservation of Visual Resources	• A. An applicant proposing new development shall provide the Director with an evaluation of the project's visual impact, and incorporate in its design, to the satisfaction of the Director, the following elements: 1. Preservation of public views to and from the bluffs, to the shoreline and ocean, and to the wetlands; 2. Preservation of existing mature trees to the maximum extent feasible.
Chapter 221, Coastal Zone Overlay District; Section 221.28 Maximum Height	• B. All rooftop mechanical devices, except for solar panels, which may be permitted to exceed the height limit under Section 230.72, shall be set back and screened so that they are not visible.
Title 23 – Provisions Applying in All or Several Districts	
Chapter 230, Site Standards; Section 230.76 Screening of Mechanical Equipment	• A. General Requirement. [A]ll exterior mechanical equipment…shall be screened from view on all sides. Equipment to be screened includes, but is not limited to, heating, air conditioning, refrigeration equipment, plumbing lines, ductwork, and transformers. Screening of the top of equipment may be required by the Director, if necessary to protect views from an R or OS district. Rooftop mechanical equipment shall be setback 15 feet from the exterior edges of the building. • C. Screening Specifications. A mechanical equipment plan shall be submitted to the Director to ensure that the mechanical equipment is not visible from a street or adjoining lot.

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Laws, Ordinances, Regulations, and Standards Applicable to Visual Resources

Sources and Goals; Chapters and Sections	Objectives, Policies, and Standards
Chapter 231, Off-Street Parking and Loading Provisions; Section 231.18 Design Standards	• C. Illumination. All parking area lighting shall be energy-efficient and designed so as not to produce glare on adjacent residential properties. Security lighting shall be provided in areas accessible to the public during nighttime hours, and such lighting shall be on a time-clock or photo-sensor system.
Chapter 232, Landscape Improvements; Section 232.02 Applicability	Minimum site landscaping and required planting areas shall be installed and maintained in accord with the standards and requirements of this Chapter, which shall apply to all nonresidential projects….
Chapter 232, Landscape Improvements; Section 232.04 General Requirements	• A. Landscape plans shall be prepared by a California State Licensed Landscape Architect except plans for residential projects…. The plans shall be submitted to the Public Works and Community Development Departments and receive approval prior to issuance of a building permit. No significant or substantive changes to approved landscaping or irrigation plans shall be made without prior written approval by the Director and the landscape designer. Substantial changes shall require approval of the Planning Commission or Zoning Administrator, whichever granted approval of the project. • B. Landscape improvements shall comply with the Arboricultural and Landscape Standards and Specifications on file in the Department of Public Works. • C. Landscape materials shall not be located such that, at maturity: 1. They interfere with safe sight distances for vehicular, bicycle or pedestrian traffic; 2. They conflict with overhead or underground utility lines, overhead lights, or walkway lights; or 3. They block pedestrian or bicycle ways. • D. Evidence of completion of required landscaping and irrigation improvements shall be supplied to the Public Works Department on a Landscape Certification form. This form shall be required to be submitted prior to issuance of an occupancy permit for new construction. • E. If mature trees that were originally required to be planted by this code, conditions of approval, or designed plans are removed, or if mature trees that are considered as specimen trees are removed, or if the trees are permanently disfigured or mutilated beyond their ability to regrow to an acceptable form for that specific variety, then those trees shall be replaced and, whenever possible, with equivalent size and specie per the project’s original approved plans.

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Laws, Ordinances, Regulations, and Standards Applicable to Visual Resources

Sources and Goals; Chapters and Sections	Objectives, Policies, and Standards
Chapter 232, Landscape Improvements; Section 232.06 Materials	Landscape improvement plans shall be harmonious with the architectural design and demonstrate a recognizable pattern or theme for the overall development by choice and location of materials. • A. Plant materials shall be selected for energy efficiency and drought tolerance; adaptability and relationship to Huntington Beach environment; color, form and pattern; ability to provide shade; soil retention, fire resistiveness, etc. The overall landscape plan shall be integrated with all elements of the project, such as buildings, parking lots and streets, to achieve desirable micro-climate and minimize energy demand and water use. • B. The use of crushed rock or gravel for large area coverage shall be avoided. • C. Nonturf areas, such as shrub beds, shall be top dressed with a bark chip mulch or approved alternative. • D. Where shrubs or low-level vegetation are used, vegetative matter at maturity shall cover at least 75 percent of actual planted area. • E. The use of landscape materials shall be designed to minimize sun exposure of paved surfaces and structures. • F. Irrigation systems shall be in accordance with the City water efficient landscape requirements of Chapter 14.52 and the Arboricultural Standards and Specifications on file in the Department of Public Works. • G. Turf areas shall be minimized. Those areas proposed shall be planted with field-grown established drought-tolerant sod. Seeding may be allowed by the Director. • H. Seventy-five percent of all shrubs, except those used for ground cover, shall be a minimum 5-gallon size. • I. Ground cover areas shall be planted with well-rooted cuttings or container stock.
Chapter 232, Landscape Improvements; Section 232.08 Design Standards	• A. General Planting Provisions 1. A minimum of 8 percent of the total net site area shall be landscaped, or as required by Title 21 or conditions of approval. 2. For traffic visibility purposes, the maximum height of shrubbery shall be 32 inches within any parking area and within 5 feet of any driveway. 3. Turf shall not be installed on grade differential greater than

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Laws, Ordinances, Regulations, and Standards Applicable to Visual Resources

Sources and Goals; Chapters and Sections	Objectives, Policies, and Standards
	4:1. Where the maximum overall grade differential is three (3) feet, 3:1 shall be considered maximum. 4. Any planter or screen wall shall be placed behind the landscape area and shall set back 5 feet from the edge of any alley or driveway. • B. General Tree Requirements 4. Non-residential developments shall have one 36-inch box tree for each 45 lineal feet of street frontage planted within the first 15 feet of the setback area adjacent to a street. 5. Specimen palms may be substituted at a ratio of ½ foot brown trunk height for 1 inch of box tree inch required. • C. Off-Street Parking Facilities 1. A 10-foot-wide landscaped planter area (inside dimension) shall be provided between any streetside property line and a parking area except at driveway openings. Berming shall be a minimum of 20 inches in height. When a planting area is less than 10 feet wide, a 32-inch-high wall shall be provided. 2. Parking facilities shall have perimeter landscaping areas as follows: a) Areas shall be a minimum 3 feet in plantable width and include one tree for each 90 square feet of landscaped area. b) Areas shall be increased to 5 feet in plantable width when the parking facility dimension is more than 100 feet adjacent to the side or rear property line. c) Minimum plantable area for each tree shall be 48 inches square. 3. Interior landscaping areas shall be distributed throughout the parking area and shall equal 5 percent of the perimeter landscaping area. These areas shall include a minimum of one minimum 24-inch box tree for every 10 parking spaces and shall be located throughout the parking area. 4. The end of each row of parking spaces shall be separated from driveways by a landscaped planter, minimum 2 feet wide and in addition include a “step off” area. 5. Planter areas adjacent to parking spaces shall be provided with a 12-inch-wide by 3½-inch-thick “step off” area flush with and behind the curb for the entire length of planter or provide 4-foot-square or 5-foot-diameter circular planter surrounded by textured/and/or colored concrete.

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Laws, Ordinances, Regulations, and Standards Applicable to Visual Resources

Sources and Goals; Chapters and Sections	Objectives, Policies, and Standards
	6. A concrete curb may be required adjacent to the sidewalk within the right-of-way. 7. All parking area landscaping shall be protected from vehicular and pedestrian damage by a 6-inch-high, 6-inch-wide curb of Portland cement concrete. Additional protection shall be provided by one of the following methods: a) Two (2) feet of landscaping consisting of low shrubs or ground cover may be provided between a parking stall and the required landscape area. The additional landscaping shall not count toward the required percentage of landscaping or minimum planter width. This method will allow vehicles to extend over the additional landscape area in conjunction with permitting a reduction in the required length of the parking space from 19 feet to 17 feet; or b) Other alternatives acceptable to the Director.
Chapter 232, Landscape Improvements; Section 232.10 Irrigation	All landscape areas shall be provided with a permanent underground, electrically automated irrigation system, designed to provide complete and adequate coverage to sustain and promote healthy plant life. The irrigation system shall not cause water to spray onto or cause water, mud or debris to flow across a public sidewalk. Pop-up sprinkler heads shall be required directly adjacent to all pedestrian or vehicular surfaces and located in areas that avoid vehicle overhang.
Title 24 – Administration	
Chapter 244, Design Review; Section 244.02 Applicability	Design review is required for all projects pursuant to any other provision of this Zoning and Subdivision Ordinance and for all projects located within redevelopment areas, specific plans as applicable, areas designated by the City Council, City facilities or projects abutting or adjoining City facilities, projects in or abutting or adjoining OS-PR and OS-S districts, and General Plan primary and secondary entry nodes.
Chapter 244, Design Review; Section 244.06 Scope of Review	• A. In making its determination, the Board shall review and consider: 1. The arrangement and relationship of proposed structures and signs to one another and to other developments in the vicinity; 2. Whether the relationship is harmonious and based on good standards of architectural design; 3. The compatibility in scale and aesthetic treatment of proposed structures with public district areas; 4. The adequacy of proposed landscaping;

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Laws, Ordinances, Regulations, and Standards Applicable to Visual Resources

Sources and Goals; Chapters and Sections	Objectives, Policies, and Standards
	5. Elements of design affecting the performance characteristics of the proposed development; and 6. Whether energy conservation measures have been proposed and the adequacy of such measures, including, but not limited to, the use of active and passive solar energy systems.
Chapter 244, Design Review; Section 244.06 Scope of Review	• A. In making its determination, the Board shall review and consider: 7. The arrangement and relationship of proposed structures and signs to one another and to other developments in the vicinity; 8. Whether the relationship is harmonious and based on good standards of architectural design; 9. The compatibility in scale and aesthetic treatment of proposed structures with public district areas; 10. The adequacy of proposed landscaping; 11. Elements of design affecting the performance characteristics of the proposed development; and 12. Whether energy conservation measures have been proposed and the adequacy of such measures, including, but not limited to, the use of active and passive solar energy systems.
Chapter 244, Design Review; Section 244.08 Required Plans and Materials	Plans and materials to fully describe and explain the proposed development shall be submitted as required by the application form or by the Director, as deemed necessary.
Sources: City of Huntington Beach 1996, 2004, 2010, 2013a, 2013b, 2011; Zoning and Subdivision Ordinance of the City of Huntington Beach is available at: <http://www.huntingtonbeachca.gov/Government/Elected_Officials/city_clerk/Zoning_Code/index.cfm?cross=ture&department=planning&sub=zoning&page=>.	

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VISUAL RESOURCES ATTACHMENT-1

Complaint Report and Resolution Form

Facility Name: Huntington Beach Energy Project **Complaint Log No:**

Complainant's name and address: Phone No:

Date and time complaint received:

Complaint filed: ☐ By Telephone ☐ In Writing (attach letter) ☐ In Person

Date of first occurrence:

Description of the complaint (lighting, duration, etc.):

Findings of investigation by AES personnel:

Indicate if complaint relates to a violation of an Energy Commission condition: ☐ Yes ☐ No

Date complainant contacted to discuss findings:

Description of corrective measures taken or other complaint resolution:

Indicate if complainant agrees with proposed resolution:

In not, explain:

Additional relevant information:

If corrective action necessary, date completed:

Date of first response to complainant: (attach copy)

Date of final response to complainant: (attach copy)

This information is certified to be correct:

Plant or project manager's signature: Date:

WASTE MANAGEMENT

Testimony of Ellie Townsend-Hough

SUMMARY OF CONCLUSIONS

Management of the waste generated during demolition[1] construction and operation of the Huntington Beach Energy Project (HBEP) 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 Application for Certification and staff's proposed conditions of certification are implemented.

There are a number of Recognized Environmental Conditions (RECs) that could require site remediation at the existing Huntington Beach Generating Station (HBGS). The primary portions of the site that are contaminated will be the responsibility of Southern California Edison (SCE). SCE has provided a Closure Plan, soil sampling and groundwater analysis for the Huntington Beach retention basins. In addition, more complete sampling results would be obtained as existing structures are demolished. The Soil Sampling and the Remediation Plan would be submitted to staff and the Huntington Beach Fire Department prior to the project site grading.

INTRODUCTION

This Final Staff Assessment (FSA) presents an analysis of issues associated with wastes generated from the proposed construction and operation of the Huntington Beach Energy Project (HBEP). 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** and **HAZARDOUS MATERIALS MANAGEMENT** sections of this document.

The 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.

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[1] For purposes of this section, unless otherwise specified, "demolition" refers to activities associated with the removal of Units 1, 2, and 5 from the existing Huntington Beach Generating Station. Activities associated with the removal of Units 3 and 4 are subject to the Energy Commission's conditions of certification in 00-AFC-13C

- 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

The following federal, state, and local environmental laws, ordinances, regulations, and standards (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 HBEP with respect to management of waste.

Waste Management Table 1
Laws, Ordinances, Regulations, and Standards (LORS)

Applicable LORS	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.

Applicable LORS	Description
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.

Applicable LORS	Description
California Health and Safety Code, Chapter 6.11 §§ 25404–25404.9 Unified Hazardous Waste and Hazardous Materials Management Regulatory Program (Unified Program)	The Unified Program consolidates, coordinates, and makes consistent the administrative requirements, permits, inspections, and enforcement activities of the six environmental and emergency response programs 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). Orange 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.

Applicable LORS	Description
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 Orange 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.

Applicable LORS	Description
Huntington Beach Fire Department City Specifications Underground Storage Tanks (city Spec 418). Aboveground Storage Tanks (City Spec 425), Soil Cleanup Standards (City Specs 431-92)	The Huntington Beach Fire Department administers the Hazardous Waste, Underground Storage Tank, and Aboveground Petroleum Storage Tank programs
Orange 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).
Orange County Health Care Agency - Environmental Health Division, Hazardous Waste Inspection Program	Hazardous Material Division is the Certified Unified Program Agency (CUPA) for Orange 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.
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 proposed project site would be located within the HBGS site on a 28.6-acre site at 21730 Newland Street, in Huntington Beach, Orange County, California. The Assessor's Parcel Numbers for HBEP are 114-150-82 and 114-150-96 (HBEP 2012a, page 1-4). HBGS is a highly disturbed industrial brownfield site. The site is bordered to the north and east by the Huntington Beach Channel and residential areas, to the west by manufactured homes/recreational vehicle park, and to the south and southwest by the Huntington Beach State Park and Pacific Ocean, and the southeast by Huntington Beach Wetland Preserve/Magnolia March wetlands (HBEP 2012a,page1-2). The ASCON Landfill site is a state Superfund site located to the northeast of HBGS (HBEP 2012a, Appendix 5.14A, page 15). Records indicate that groundwater contamination is known to exist at the ASCON site and there is potential for the contaminated groundwater to have migrated to the HBGS. This potential for contaminant migration from the ASCON Landfill site is identified as an area of potential concern.

HBGS currently consists of five units (Units 1 through 5). Units 1 and 2 are in operation. Units 3 and 4 were decommissioned in 2012 and replaced by synchronous condensers[2], and Unit 5, a peaking unit, was retired in 2002. Demolition would begin with decommissioned peaker Unit 5 and the east fuel oil storage tank and the JP4 storage tank (see **Waste Management Figure 1**). HBEP Block 1 would be constructed where Unit 5 and the two fuel oil storage tanks are located. HBGS Units 3 and 4 are owned by Edison Mission Huntington Beach, LLC, and their demolition is not considered part of the HBEP (HBEP 2012n Data Response 70). HBEP Block 2 would be constructed on the site of Units 3 and 4 (HBEP 2012n Data Response 70). Units 1 and 2 would be demolished after the construction of HBEP Block 2 (HBEP 2012a, page 5.14-1).

The construction and demolition of HBEP would be scheduled over approximately a 7-year period. The demolition of HBGS Units 1, 2, and 5 would produce a variety of mixed wastes, such as soil, wood, metal, and concrete, etc. Units 3 and 4 are subject to the Energy Commission's compliance oversight in 00-AFC-13C, and will be include in the Cumulative Impact analysis. Waste would be recycled where practical and non-recyclable waste will 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 (HBEP 2012a, § 5.14.4). 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.

[2] Synchronous condensers provide voltage support to the grid, but do not generate electricity.

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[3] 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.

   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.

[3] 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.

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 Huntington Beach Generating Station began operation in 1958 under the ownership of Southern California Edison (SCE). The power plant utilized fuel oil for production of electricity through its five generating units until the late 1980s, when the generating units were converted to natural gas operation. AES Huntington Beach, LLC, acquired the HBGS from SCE in 1998. Current operation at the HBGS consists of two steam turbine generating units with a total capacity of 430 MW. The proposed HBEP would be built within the footprint of the operating Huntington Beach Electrical Generating Station. Each operating unit consists of a boiler, turbine and other support facilities.

A Phase I Environmental Site Assessment (ESA) dated February 2012, was prepared by EMS for the Huntington Beach Energy Project. The ESA encompassed 46.23 acres located on four parcels which included the project site. The HBEP would be built on two of the four parcels. The ESA was completed in accordance with the American Society for Testing and Materials Standard Practice E 1527-05 for ESAs. The Phase I ESA is included as Appendix 5.14A of the project Application for Certification (AFC) (HBEP 2012a, Appendix 5.14A). The RECs and Historical RECs identified are included in **Waste Management Table 2**.

Waste Management Table 2
Recognized Environmental Conditions

Areas of Concern	Type of contamination	Regulating Agency
Units 1 & 2 Retention Ponds	Metals, VOCs	DTSC – by stipulated order
Plugged oil & gas wells	Several	Huntington Beach Fire Department and the California Department of Conservation, Division of Oil, Gas and Geothermal Resources (DOGGR)
North fuel oil storage tank	Fuel oil	Huntington Beach Fire Department
Aboveground Storage Tanks	Unit 5 Peaker Fuel Oil Tank – 21,500 Barrels (64 Foot Diameter x 40 Feet Tall) Large Oil Tank – 220,000 Barrels (200 Foot Diameter x 40 Feet Tall)	Huntington Beach Fire Department
Aboveground & underground pipelines	Fuel oil	Huntington Beach Fire Department
Groundwater	Metals, VOCs, 1,4-dioxane	DTSC – thru corrective action
Several spills	Petroleum	DTSC – thru corrective action
Concrete degreasing pits		DTSC – thru corrective action
Near retention basin	TCE, PCE	
Machine shop area	Various chemicals	
Transformers	1984 rupture of Number 4 Auxiliary transformer	
Number of USTs	Various	Huntington Beach Fire Department, Orange County Health Care Agency
Contaminated Groundwater (adjacent to the property)	Various	DTSC
Asbestos	Site buildings were constructed prior to 1980.	South Coast Air Quality Management District
Lead	Site buildings were constructed prior to 1980.	

According to the Phase I ESA, per the Department of Oil Gas and Geothermal Resources (DOGGR) Online Mapping System, there is one plugged oil and gas well on the southwestern portion of the HBGS site between Units 1 and 2 and the retention ponds. There are also numerous wells including two plugged oil and gas wells located east of the North and East fuel oil storage tanks. North of the North fuel oil storage tank is an abandoned dry hole (see **Waste Management Figure 1**). Additional information on the abandoned wells is included in the **GEOLOGY AND PALEONTOLOGY** section (see condition of certification **GEO-2**).

The project owner would come in contact with many of the RECs listed in **Waste Management Table 2** during demolition. SCE has indicated they have primary responsibility for the REC's. The project owner and SCE have indicated they would coordinate and contact the appropriate regulatory agency and, when required complete remediation, of contaminated areas prior to construction. SCE is currently working with the Department of Toxic Substance Control on the closure of the HBGS retention basin site (Jamison and Associates 2012). The RECs that are associated with the HBEP will be mitigated according to staff's conditions of certification and federal, state and local LORS.

After the completion of the Preliminary Staff Assessment (PSA) staff received a copy of the Draft Closure Plan for the Huntington Beach Generating Station Retention Basin Site. The Draft Closure Plan incorporated soil borings analysis and sampling around the retention basin and a few buildings on the project site. Many of the soil removal/cleanup procedures for the retention basin have already been approved by the Department of Toxic Substance control for the retention basin. The Closure Plan confirmed that regulatory oversight has been ongoing on the project site. After completion of the PSA staff also received a letter dated November 12, 2013, from the City of Huntington Beach referencing applicable ordinances and requirements they would require for remediation of site contamination. This letter indicated that they typically require characterization and remediation prior to site grading. Also, on October 17, 2013, staff had an opportunity to complete a site visit of the Huntington Beach Generating Station with Randall Weidner of Southern California Edison (SCE) after publication of the PSA and get a better understanding of site conditions. SCE discussed the process they propose for clean up, their close coordination with Department of Toxic Substances Control (DTSC) and the timing for characterization and remediation they envision immediately after demolition and prior to grading. Staff has also had discussions with the Department of Toxic Substances Control and the Huntington Beach Fire Department (HBFD) to discuss whether allowing site characterization and remediation after certification but prior to project construction was feasible.

The Huntington Beach Fire Department recommended that Soil Sampling and a Remediation Plan be submitted to staff and the Fire Department prior to project site grading. The Fire Department representative, Joe Morelli, thought that the requirement for the applicant to sample and begin remediation prior to the demolition at the site was much more stringent than the fire department would require. SCE has provided for soil sampling and groundwater analysis for the Huntington Beach retention basins. In addition, more complete sampling results would be obtained as existing structures are demolished. Staff concludes that if the applicant complies with the HBFD and DTSC requirements for site characterization and remediation as outlined in the ordinances referenced in the City of Huntington Beach's letter (November 12, 2013), then these activities can be conducted post certification. Staff recommends that the Existing Site Contamination section of the Waste Management PSA and **WASTE-1** be replaced (CHB 2013a).

Staff proposes Condition of Certification **WASTE-1,** which would ensure the applicant adequately characterizes the site and completes remediation in accordance with the Energy Commission's conditions of certification as well as applicable LORS. Staff proposes Condition of Certification **WASTE-1** requiring that any additional work must be conducted under the oversight of the Energy Commission Compliance Project Manager (CPM), the Department of Toxic Substances Control (DTSC), the Huntington Beach Fire Department and Orange County.

Furthermore, staff proposes Conditions of Certification **WASTE-3** and **WASTE-4** be adopted to address any soil contamination contingency that may be encountered during project construction. **WASTE-3** would require 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, **WASTE-4** would require 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. **WASTE–4** also addresses identification and investigation of any previously unidentified soil or groundwater contamination that may be encountered.

Demolition and Construction Impacts and Mitigation

Site preparation, demolition, and construction of the proposed power plant and associated facilities would last approximately seven years and generate both nonhazardous and hazardous wastes in solid and liquid forms (HBEP 2012a, § 5.14.4.1). Before demolition and construction can begin, the project owner would be required to develop and implement a Demolition and Construction Waste Management Plan, per proposed Condition of Certification **WASTE-5**.

Nonhazardous Wastes

Nonhazardous waste would be generated from the demolition of Huntington Beach Generating Station's Units 1, 2, and 5 and the construction of HBEP. Roughly 25,544 tons of demolition nonhazardous waste and 390 tons of construction nonhazardous waste would be generated as part of the HBEP project (HBEP 2012a, page 5.14-11). 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. During demolition, approximately 2,350 tons of concrete and 22,000 tons of metal debris would be recycled (HBEP 2012a, page 5.14-6). During construction, 288 tons of paper, wood, glass and plastics will be generated and recycled where practical. Approximately 36 tons of metal would be recycled (HBEP 2012a, Table 5.14-2).

The California Department of Resources Recycling and Recovery (now CalRecycle, formerly California Integrated Waste Management Board (CIWMB)) is responsible for recycling, waste reduction, and product reuse programs in California. CalRecycle also promotes innovation in technology to encourage economic and environmental sustainability. The 2008 California Green Building Standards Code Requires all construction projects to develop a recycling plan to divert and/or recycle at least 50 percent of waste generated during construction, (CalGreen Building Standards Code Section 708 construction Waste Reduction, Disposal and Recycling).

Adoption of Condition of Certification **WASTE-5** would facilitate proper management of project demolition and construction wastes since the Orange County maintains a Construction and Demolition (C&D) Recycling and Reuse policy and program. Staff proposes Condition of Certification **WASTE-5** requiring the project owner to develop and implement a Construction Waste Management Plan and submit copies of C&D paperwork to the CPM. These conditions would require the applicant to identify type, volume, and waste disposal and recycling methods to be used during construction of the facility. Staff believes that compliance with proposed Conditions of Certification **WASTE-5** will assist the applicant's compliance with the CalGreen Building Code requirements.

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

The HBEP would produce hazardous waste during demolition and construction. It is anticipated that 1,205 tons of hazardous waste would be generated during demolition. The waste generated would include: asbestos waste, electrical equipment, used oils, universal wastes and lead-acid storage batteries (HBEP 2012a page 5.14-13). Demolition of Units 1, 2 and 5 would generate 700 tons of asbestos that would be disposed of in a permitted facility (HBEP 2012n, Data Request 71). 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. **WASTE-2** requires that the project owner submit 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 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 AFC (HBEP 2012a, § 5.14.1.2.2).

Wastes would be accumulated on site for less than 90 days and then properly manifested, transported, and disposed at a permitted hazardous waste management facility by licensed hazardous waste collection and disposal companies. Staff reviewed the disposal methods described in AFC section 5.14.4.1.2 and concluded that all wastes would be disposed in accordance with all applicable LORS. 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-6** to notify the Energy Commission's Compliance Project Manager (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-3** and **WASTE-4** 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 HBEP would generate non-hazardous and hazardous wastes in both solid and liquid forms under normal operating conditions. (HBEP 2012a Table 5.14-4) of the project AFC gives 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-7**.

Non-Hazardous Solid Wastes

The generation of as much as 39 tons per year of non-hazardous solid wastes expected during project operation include routine maintenance wastes (such as used air filters, spent deionization resins, sand and filter media), 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 will be regularly transported off site to a local solid waste disposal facility (HBEP 2012a, § 5.14.1.2.3).

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-8** 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 FSA.

The amount of hazardous wastes generated during the operation of HBEP would be minor, 100 pounds per year, with source reduction and recycling of wastes implemented whenever possible (HBEP 2012a, Table 5.14-4). 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-6** to notify the CPM whenever the owner becomes aware of any such action.

Impact on Existing Waste Disposal Facilities

Non-Hazardous Wastes

The HBEP facility would generate nonhazardous solid waste that would add to the total waste generated in Orange County, California. The proposed project, would generate 56,389 cubic yards of solid waste during demolition, approximately 2,600[4] cubic yards of solid waste during construction, and approximately 26 cubic yards per year would be produced during operation. Nonhazardous waste would be disposed in a California Class III landfill (HBEP 2012a Section 5.14).

CalRecycle is the state agency responsible for implementing the California Integrated Waste Management Act and is the state's leading authority on recycling, waste reduction, and product reuse.

The county is required to submit an Integrated Waste Management Plan (IWMP) in accordance with state waste diversion mandates for jurisdictions (Chapter 764, Statutes of 1999). The Source Reduction and Recycling Element (SRRE), a Household Hazardous Waste Element (HHWE) and a Non-Disposal Facility Element (NDFE) are all elements that comprise the IWMP. For enforcement purposes, jurisdictions are evaluated on the effectiveness of their SRRE.

Once a California jurisdiction adopts an SRRE, it must implement the SRRE to the best of its ability. The jurisdiction can update the SRRE through CalRecycle's electronic annual reporting system at any time as diversion programs need to be modified (e.g., a new program to address commercial waste and the expansion of educational programs.)

[4] The volume estimates (cubic yards) for solid/non-hazardous waste are staff generated numbers based on a conversion factor of approximately 906 pounds per cubic yard (taking into account the large amounts of ferrous metal and cement due to tank demolition) and 300 pounds per cubic yard for construction waste (HBEP Tables 5.14-1, 5.14-2 and Table 5.14-3). See http://www.calrecycle.ca.gov/lgcentral/library/dsg/apndxi.htm and city of Antioch conversion factors.

To help CalRecycle determine whether a jurisdiction is taking the appropriate steps to implement its SRRE, the jurisdiction submits an annual report to CalRecycle. The annual report includes the jurisdiction's program information and per capita disposal information (Note: The per capita disposal data is derived from the statewide disposal reporting system). CalRecycle requires the county to report to the disposal reporting system all waste disposed in the county pursuant to Title 14, CCR, Sections 18800-18814.11. The disposal data is compiled for each jurisdiction to measure, whether the jurisdiction has met its 50 percent equivalent diversion requirement.

CalRecycle reviews each jurisdiction's annual report information and conducts site visits to verify program implementation. Depending on the particular review cycle of the jurisdiction, CalRecycle staff review the jurisdiction's progress toward implementation of its SRRE, as well as its overall achievement of the 50 percent diversion requirement.

Orange County is required to submit an annual report that is reviewed by CalRecycle at a minimum every four years to determine if it is meeting the 50 percent diversion requirement and implementing its programs. Condition of Certification **WASTE-5** would require the project owner to submit a construction waste management plan for approval by the Energy Commission compliance project manager (CPM) and for review by Orange County that demonstrates that they met the construction waste diversion requirements of 50 percent pursuant to the CalGreen Building Codes. Pursuant to recommended Condition of Certification **WASTE-7,** the applicant would also be required to submit to the CPM for approval, and to Orange County for review, an Operation Waste Management Plan (OWMP), discussing how the project would divert to the maximum extent feasible the recyclable materials that would be generated during construction and operation of the facility. The CPM and county would determine if the plan is diverting recyclables to the maximum extent feasible. If the OWMP is approved, as a condition prior to issuance of the project's building permit, the applicant would be required to divert all materials from the solid waste stream that could reasonably be diverted for alternate uses.

Waste Management Table 3 presents details of two 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 HBEP. Total solid waste disposal in Orange County in 2010, was 3,360,593 tons[5]. The remaining capacity for the two Orange County landfills combined is approximately 245 million cubic yards. The total amount of non-hazardous waste generated from project construction and operation after the material has been diverted to the maximum extent feasible would contribute less than one percent of the available landfill capacity. Staff concludes that disposal of the solid wastes generated by HBEP could occur without significantly impacting the capacity or remaining life of any of these facilities.

[5] http://www.calrecycle.ca.gov/SWFacilities/Landfills/Tonnages/.

Hazardous Wastes

Waste Management Table 3 displays information on Class III landfills in the vicinity of the project and 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 26 and 30 years of remaining operating lifetime, respectively (HBEP 2012a, Section 5.14.2.3).

Waste Management Table 3
Recycling/Disposal Facilities

Landfill	**Location**	**Permitted Capacity**	**Remaining Capacity**	**Estimated Closure Date**
	City	Cubic yards	Cubic yards	
Class III -Nonhazardous				
Frank Bowerman Sanitary Landfill	Irvine, CA	266 million	198 million	2022
Olinda Alpha Sanitary Landfill	Brea, CA	148 million	47 million	2021
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: HBEP 2012a Section 5.14.2.3

Hazardous wastes generated during 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 8,033 cubic yards of demolition hazardous waste, 53 cubic yards of construction hazardous waste and less than 100 cubic yards per year of hazardous waste would be generated from the HBEP facility. The total amount of hazardous wastes generated by the HBEP project would consume less than one percent of the 15 million cubic yards of remaining permitted capacity. Therefore, impacts from disposal of HBEP generated hazardous wastes would have a less than significant impact on the remaining capacity at Class I landfills.

The existing available capacity for the three Class III landfills that may be used to manage nonhazardous project wastes exceeds 245 million cubic yards. The total amount of nonhazardous wastes generated from construction and operation of the proposed HBEP project would consume less than 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.

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 HBEP and the listed projects 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 Orange County C&D regulations and ordinances. As proposed, the amount of non-hazardous and hazardous wastes generated during construction and operation of the HBEP would add to the total quantity of waste generated in the State of California, however, project wastes would be generated in modest quantities, approximately 26,749 tons of solid waste during demolition of Units 1, 2, and 5 (including approximately 1,205 tons of hazardous waste, 398 tons of solid waste during construction (including approximately 8 tons of hazardous waste), and 39 tons per year from construction (HBEP 2012a, page 5.14-13. 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, 3.4 million tons of solid waste was landfilled in Orange County. HBEP's contribution would be less than one percent of the county's waste generation.

COMPLIANCE WITH LORS

Energy Commission staff concludes that the proposed HBEP would comply with all applicable LORS regulating the management of hazardous and non-hazardous wastes during both facility construction and operation. The applicant 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 HBEP would be required to obtain a hazardous waste generator identification number from U.S. EPA. The HBEP 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.

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 (90,180, 270, or 365 days depending on waste type and volumes generated), 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 **8**. These conditions would require the project owner to do all of the following:

   - Once the HBEP 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**, **3**, and **4**).
   - 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-5** and **7**).
   - Report any waste management-related LORS enforcement actions and how violations will be corrected (**WASTE-6**).
   - Ensure that all spills or releases of hazardous substances are reported and cleaned-up in accordance with all applicable federal, state, and local requirements (**WASTE-8)**.

2) Existing conditions at the HBEP 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**, **3**, **4**, **6**, and **8**. 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 construction and operation of the proposed HBEP 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 87 million cubic yards. The total amount of nonhazardous wastes generated from construction and operation of HBEP 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 HBEP have a combined remaining capacity in excess of 15 million cubic yards. The total amount of hazardous wastes generated by the HBEP project would contribute less than one percent of the remaining permitted capacity. Therefore, impacts from disposal of HBEP 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 HBEP 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 HBEP project AFC and staff's proposed conditions of certification are implemented.

PROPOSED CONDITIONS OF CERTIFICATION

WASTE-1 The project owner shall ensure that the HBEP project site is properly characterized and remediated as necessary pursuant to the corrective action plans reviewed by DTSC, the Huntington Beach Fire Department and/or the Orange County Health Care Agency, and approved by the Energy Commission CPM. In no event shall project construction commence in areas requiring characterization and remediation until the CPM determines, with confirmation from the appropriate regulatory agency, that all necessary remediation has been accomplished.

All soils at the site shall conform to City of Huntington Beach's Specification # 431-92 Soil Clean-Up Standards Soil testing for the contaminants identified in City Specification 431-92 and for Methane Gas, in accordance with City Specification 429, shall be completed as follows:

a. Soil Sampling Work Plan: A qualified environmental consultant shall prepare and submit a soil sampling work plan (for contaminants identified in City Specification 431-92 and for methane gas) to the CPM and the Huntington Beach Fire Department HBFD for review and timely comment. Once the HBFD reviews and the CPM approves the work plan, the sampling may commence.

Note: Soil shall not be exported to other City of Huntington Beach locations without first being demonstrated to comply with City Specification 431-92 Soil Clean Up Standards. Also, any soil proposed for import to the site shall first be demonstrated to comply with City Specification 431-92.

b. Soil Sampling Lab Results: Conduct the soil sampling in accordance with the HBFD approved work plan. After the sampling is conducted, the lab results (along with the Environmental Consultants summary report) for methane and 431-92 testing shall be submitted to the CPM and HBFD. for review.

c. Remediation Action Plan: If contamination is identified, provide a Fire Department approved Remediation Action Plan (RAP) based on requirements found in Huntington Beach *City Specification #431-92, Soil Cleanup Standard.* All soils shall conform to City Specification # 431-92 Soil Clean-Up Standards prior to the issuance of a grading or building permit.

d. Prior to and during grading and construction, discovery of additional soil contamination or underground pipelines, etc., must be reported to the CPM and the HBFD immediately and the approved work plan modified accordingly in compliance with City Specification #431-92 Soil Clean-Up Standards.

e. Outside City Consultants: The HBFD review of this project and subsequent plans will require the use of City consultants. The Huntington Beach City Council approved fee schedule allows the Fire Department to recover consultant fees from the applicant, developer or other responsible party.

The project owner shall furnish a final copy of. Items a. through e. to the Energy Commission CPM, DTSC, the Huntington Beach Fire Department and/or the Orange County Health Care Agency. An initial draft of the remedial documents shall be provided to the Energy Commission CPM, DTSC and the Huntington Beach Fire Department for review and timely comments. The final document shall be approved by the CPM. The final copy of the remedial plan shall reflect recommendations of the CPM, DTSC, and the Huntington Beach Fire Department, the project owner shall provide to the CPM for review and approval written notice from the appropriate regulatory agency that the HBEP site has been investigated and remediated as necessary in accordance with the corrective action plan.

<u>Verification:</u> At least 30 days prior to implementation the project owner shall submit the Soil Sampling Work Plan to the CPM for approval. Within 30 days of implementing the Soil Sampling Work Plan, the project owner shall submit copies of all soil sampling lab results with the summary report for review. At least 90 days prior to implementation the project owner shall submit the Remediation Action Plan to the CPM for review and approval. If additional soil contamination is encountered prior to or during grading the project owner will shall revise the approved work plan and submit it for CPM approval within 30 days after contamination is identified.

WASTE-2 Prior to demolition of existing structures associated with Units 1, 2, and 5, the project owner shall complete and submit a copy of a SCAQMD Asbestos Demolition Notification Form to the CPM and the SCAQMD for approval. After receiving approval, the project owner shall remove all Asbestos Containing Material (ACM) 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 Asbestos Demolition Notification Form 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 is removed from the site.

WASTE-3 The project owner shall provide the resume of an experienced and qualified professional engineer or professional geologist, who shall be available for consultation during site characterization (if needed), demolition, excavation, and grading activities, to the CPM for review and approval. The resume shall show experience in remedial investigation and feasibility studies.

The professional engineer or professional geologist shall be given full authority by the project owner 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 resume of the professional engineer or professional geologist to the CPM for review and approval.

WASTE-4 If potentially contaminated soil is identified during site characterization, demolition, excavation, or grading at either the proposed site or linear facilities, as evidenced by discoloration, odor, detection by handheld instruments, or other signs, the professional engineer or professional geologist shall inspect the site, determine the need for sampling to confirm the nature and extent of contamination, and provide a written report to the project owner, representatives of Department of Toxic Substances Control, and the CPM stating the recommended course of action.

Depending on the nature and extent of contamination, the professional engineer or professional 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 professional engineer or professional geologist, significant remediation may be required, the project owner shall contact the CPM and representatives of the Department of Toxic Substances Control for guidance and possible oversight.

Verification: The project owner shall submit any final reports filed by the professional engineer or professional geologist to the CPM within 5 days of their receipt. The project owner shall notify the CPM within 24 hours of any orders issued to halt construction.

WASTE-5 The project owner shall prepare a Construction Waste Management Plan for all wastes generated during construction of the facility and shall submit the plan to the CPM for review and approval. The plan shall contain, at a minimum, the following:

- a description of all construction waste streams, including projections of frequency, amounts generated, and hazard classifications;
- management methods to be used for each waste stream, including temporary on-site storage, housekeeping and best management practices to be employed, treatment methods and companies providing treatment services, waste testing methods to assure correct classification, methods of transportation, disposal requirements and sites, and recycling and waste minimization/source reduction plans.
- a method for collecting weigh tickets or other methods for verifying the volume of transported and or location of waste disposal; and,
- a method for reporting to demonstrate project compliance with construction waste diversion requirements of 50 percent pursuant to the CalGreen Code and Construction and Orange County Construction & Demolition Recycling and Reuse Program.

Verification: The project owner shall submit the Construction Waste Management Plan to the CPM for approval no less than 30 days prior to the initiation of construction activities at the site.

The project owner shall also document in each monthly compliance report (MCR) the actual volume of wastes generated and the waste management methods used during the year; provide a comparison of the actual waste generation and management methods used to those proposed in the original Construction Waste Management Plan; and update the Construction Waste Management Plan, as necessary, to address current waste generation and management practices.

WASTE-6 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 way project-related wastes are managed.

WASTE-7 The project owner shall prepare an Operation Waste Management Plan for all wastes generated during operation of the facility and shall submit the plan to the CPM for review and approval. The plan shall contain, at a minimum, the following:

- a detailed description of all operation and maintenance waste streams, including projections of amounts to be generated, frequency of generation, and waste hazard classifications;

- management methods to be used for each waste stream, including temporary on-site storage, housekeeping and best management practices to be employed, treatment methods and companies providing treatment services, waste testing methods to assure correct classification, methods of transportation, disposal requirements and sites, and recycling and waste minimization/source reduction plans;
- information and summary records of conversations with the local Certified Unified Program Agency and the Department of Toxic Substances Control regarding any waste management requirements necessary for project activities. Copies of all required waste management permits, notices, and/or authorizations shall be included in the plan and updated as necessary;
- a detailed description of how facility wastes will be managed and any contingency plans to be employed, in the event of an unplanned closure or planned temporary facility closure; and
- a detailed description of how facility wastes will be managed and disposed upon closure of the facility.

Verification: The project owner shall submit the Operation Waste Management Plan to the CPM for approval no less than 30 days prior to the start of project operation. The project owner shall submit any required revisions to the CPM within 20 days of notification from the CPM that revisions are necessary.

The project owner shall also document in each Annual Compliance Report the actual volume of wastes generated and the waste management methods used during the year; provide a comparison of the actual waste generation and management methods used to those proposed in the original Operation Waste Management Plan; and update the Operation Waste Management Plan as necessary to address current waste generation and management practices.

WASTE-8 The project owner shall ensure that all spills or releases of hazardous substances, materials, or waste are reported, cleaned up, and remediated as necessary, in accordance with all applicable federal, state, and local requirements.

Verification: The project owner shall document all unauthorized releases and spills of hazardous substances, materials, or wastes that occur on the project property or related pipeline and transmission corridors. The documentation shall include, at a minimum, the following information: location of release; date and time of release; reason for release; volume released; amount of contaminated soil/material generated; how release was managed and material cleaned up; if the release was reported; to whom the release was reported; release corrective action and cleanup requirements placed by regulating agencies; level of cleanup achieved and actions taken to prevent a similar release or spill; and disposition of any hazardous wastes and/or contaminated soils and materials that may have been generated by the release. Copies of the unauthorized spill documentation shall be provided to the CPM within 30 days of the date the release was discovered.

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WORKER SAFETY AND FIRE PROTECTION

Testimony of Geoff Lesh, PE

SUMMARY OF CONCLUSIONS

Staff concludes that if the applicant for the proposed Huntington Beach Energy Project (HBEP), provides a Project Construction Safety and Health Program and a Project Operations and Maintenance Safety and Health Program, as required by Conditions of Certification **WORKER SAFETY-1** and **-2** and fulfils the requirements of Conditions of Certification **WORKER SAFETY-3** through **-6**, the project would incorporate sufficient measures to ensure adequate levels of industrial safety and comply with applicable laws, ordinances, regulations, and standards. The proposed conditions of certification provide assurance that the Construction Safety and Health Program and the Operations and Maintenance Safety and Health Program proposed by the applicant would be reviewed by the appropriate agencies before implementation. The conditions also require verification that the proposed plans adequately assure worker safety and fire protection and comply with applicable laws, ordinances, regulations, and standards.

The Huntington Beach Fire Department has stated that its ability to respond to emergency calls will not be affected by the construction and operation of the HBEP. Therefore, staff agrees with the applicant that mitigation is not required.

INTRODUCTION

Worker safety and fire protection is regulated through laws, ordinances, regulations, and standards (LORS), at the federal, state, and local levels. Industrial workers at the facility operate equipment and handle hazardous materials daily and may face hazards that can result in accidents and serious injury. Protection measures are employed to eliminate or reduce these hazards or to minimize the risk through special training, protective equipment, and procedural controls.

The purpose of this Preliminary Staff Assessment (PSA) is to assess the worker safety and fire protection measures proposed by the HBEP and to determine whether the applicant has proposed adequate measures to:

- comply with applicable safety LORS;
- protect the workers during construction and operation of the facility;
- protect against fire; and
- provide adequate emergency response procedures.

LAWS, ORDINANCES, REGULATION, AND STANDARDS

Worker Safety and Fire Protection Table 1
Laws, Ordinances, Regulations, and Standards (LORS)

Applicable Law	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.
24 Cal Code Regs. section 3, et seq.	This section incorporates the current addition of the Uniform Building Code.
Health and Safety Code section 25500, et seq.	This section presents Risk Management Plan requirements for threshold quantity 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)	
California Fire Code 2010	The fire code contains general provisions for fire safety, including requirements for proper storage and handling of hazardous materials and listing of the information needed by emergency response personnel. Enforced by the Huntington Beach Fire Department.
City of Huntington Beach Municipal Code, Chapter 17.56	City of Huntington Beach Fire Code: The City of Huntington Beach has adopted the California Fire Code and has adopted several ordinances which amend it. l
City of Huntington Beach Municipal Code Section 17.58	Develop and implement safety management plans as required by CA H&SC Sections 25500-25520. Administered by the Huntington Beach Fire Department
City of Huntington Beach Fire Department City Specifications	Various Huntington Beach Fire Department City Specifications (numbered 401 through 434) may be found at: http://www.huntingtonbeachca.gov/government/departments/Fire/fire_prevention_code_enforcement/fire_dept_city_specifications.cfm
NFPA 56 (adopted 2012)	NFPA 56 is the Standard for Fire and Explosion Prevention During Cleaning and Purging of Flammable Gas Piping Systems.
National Fire Protection Association standards	These standards provide specifications and requirements for fire safety, including the design, installation, and maintenance of fire protection equipment. Enforced by the Huntington Beach Fire Department.

SETTING

The proposed facility would be located in the city of Huntington Beach within an industrial area that is currently served by the local fire department. Fire support services to the site would be under the jurisdiction of the city of Huntington Beach Fire Department (HBFD). There are a total of eight fire stations within the city of Huntington Beach. The closest station to the HBEP site would be Station #4 of the HBFD located at 21441 Magnolia Street, approximately 0.8 miles away. The total response time from the moment a call is made to the point of arrival at the site would be approximately 5 minutes .The next closest station would be Station #5, located at 530 Lake Street, about 2.0 miles away, which would respond within 6 to 7 minutes.

The first responders to a hazardous materials incident would be from Station #4 of the Huntington Beach Fire Department (HBFD). If needed, a full hazardous materials response would be provided by the HBFD Hazardous Materials Response Team (HBFD-HMRT) located at HBFD Station #6, located at 18591 Edwards Street, Huntington Beach, CA, approximate 4 miles away. The HBFD-HMRT is capable of handling any hazardous materials-related incident at the proposed facility and would have a response time of 15-to-20 minutes.

In addition to construction and operations worker safety issues, the potential exists for exposure to contaminated soil during site preparation. The Phase I Environmental Site Assessment conducted for this site in 2012 concluded that the areas beneath existing structures may have environmental conditions that would require remediation and that this should be assessed during the time these structures are removed (HBEP 2012a, §§ 5.14.1.1.2 and 5.14.1.2.1). To address the possibility that soil contamination would be encountered during construction of the HBEP, proposed Conditions of Certification **WASTE-3** and **WASTE-4** require a registered professional engineer or geologist to be available during soil excavation and grading to ensure proper handling and disposal of contaminated soil. See the staff assessment section on **WASTE MANAGEMENT** for a more detailed analysis of this topic.

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

METHOD AND THRESHOLD FOR DETERMINING SIGNIFICANCE

Two issues are assessed in **Worker Safety-Fire Protection:**

1. The potential for impacts on the safety of workers during demolition, construction, and operations activities, and

2. Fire prevention/protection, emergency medical response, and hazardous materials spill response during demolition, construction, and operations.

Worker safety issues are thoroughly addressed by 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 applicant 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 applicant 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 applicant 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 applicant 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, whether the risk (chances) of that impact occurring and causing injury or death is less than significant.

DIRECT/INDIRECT IMPACTS AND MITIGATION

Worker Safety

Industrial environments are potentially dangerous during construction and operation of facilities. Workers at the proposed HBEP 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 HBEP 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, workers will be adequately protected from health and safety hazards.

A Safety and Health Program would be prepared by the applicant to minimize worker hazards during construction and operation. Staff uses the phrase "Safety and Health Program" to refer to the measures that would be taken to ensure compliance with the applicable LORS during the construction and operational phases of the project.

Construction Safety and Health Program

HBEP encompasses construction and operation of a natural gas-fired facility. Workers would be exposed to hazards typical of construction and operation of a gas-fired simple cycle facility.

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:

- Construction Injury and Illness Prevention Program (8 Cal Code Regs. § 1509)
- Construction Fire Prevention Plan (8 Cal Code Regs. § 1920)
- Personal Protective Equipment Program (8 Cal Code Regs. §§ 1514 — 1522)
- Emergency Action Program and Plan

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 include:

- Electrical Safety Program
- Motor Vehicle and Heavy Equipment Safety Program
- Forklift Operation Program
- Excavation/Trenching Program
- Fall Protection Program
- Scaffolding/Ladder Safety Program
- Articulating Boom Platforms Program
- Crane and Material Handling Program
- Housekeeping and Material Handling and Storage Program
- Respiratory Protection Program
- Employee Exposure Monitoring Program
- Hand and Portable Power Tool Safety Program
- Hearing Conservation Program
- Back Injury Prevention Program
- Hazard Communication Program
- Heat and Cold Stress Monitoring and Control Program
- Pressure Vessel and Pipeline Safety Program
- Hazardous Waste Program
- Hot Work Safety Program
- Permit-Required Confined Space Entry Program

The Application for Certification (AFC) includes adequate outlines of each of the above programs (HBEP 2012a, § 5.16.3.3.1). Prior to the start of construction of HBEP, detailed programs and plans would be provided to the California Energy Commission compliance project manager (CPM) and to the HBFD pursuant to the Condition of Certification **WORKER SAFETY-1**.

Operations and Maintenance Safety and Health Program

Prior to the start of operations at HBEP, 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)

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 HBEP, which the applicant would develop, would ensure compliance with the above-mentioned requirements.

The AFC includes adequate outlines of the Injury and Illness Prevention Program, Emergency Action Plan, Fire Prevention Program, and Personal Protective Equipment Program (HBEP 2012a, § 5.16.3.3.2). Prior to operation of HBEP, all detailed programs and plans would be provided to the CPM and HBFD pursuant to Condition of Certification **WORKER SAFETY-2**.

Safety and Health Program Elements

As mentioned above, the applicant provided the proposed outlines for both a Construction Safety and Health Program and an Operations Safety and Health Program. The measures in these plans are derived from applicable sections of state and federal law. Both safety and health programs would comprise six more specific programs and would require major items detailed in the following paragraphs.

Injury and Illness Prevention Program

The IIPP would include the following components as presented in the AFC (HBEP 2012a, § 5.16.3.3.2):

- identity of person(s) with authority and responsibility for implementing the program;
- safety and health policy of the plan;
- definition of work rules and safe work practices for construction activities;
- system for ensuring that employees comply with safe and healthy work practices;
- system for facilitating employer-employee communications;

- procedures for identifying and evaluating workplace hazards and developing necessary program(s);
- methods for correcting unhealthy/unsafe conditions in a timely manner;
- safety procedures; and
- training and instruction.

Fire Prevention Plan

California Code of Regulations requires an Operations Fire Prevention Plan (8 Cal Code Regs. § 3221). The AFC outlines a proposed Fire Prevention Plan which is acceptable to staff (HBEP 2012a, § 5.16.3.3.2). The plan would accomplish the following:

- determine general program requirements;
- determine fire hazard inventory, including ignition sources and mitigation;
- develop good housekeeping practices and proper materials storage;
- establish employee alarm and/or communication system(s);
- provide portable fire extinguishers at appropriate site locations;
- locate fixed fire-fighting equipment in suitable areas;
- specify fire control requirements and procedures;
- establish proper flammable and combustible liquid storage facilities;
- identify the location and use of flammable and combustible liquids;
- provide proper dispensing and determine disposal requirements for flammable liquids;
- establish and determine training and instruction requirements and programs; and
- identify personnel to contact for information on plan contents.

Staff proposes that the applicant submit a final Fire Prevention Plan to the CPM for review and approval and to the HBFD for review and comment to satisfy proposed Conditions of Certification **WORKER SAFETY-1** and **WORKER SAFETY-2**.

Personal Protective Equipment Program

California regulations require Personal Protective Equipment (PPE) and first aid supplies whenever hazards are present that, due to process, environment, chemicals or mechanical irritants, can cause injury or impair bodily function as a result of absorption, inhalation, or physical contact (8 Cal Code Regs. §§ 3380 to 3400). The HBEP operational environment would require PPE.

All safety equipment must meet National Institute of Safety and Health (NIOSH) or American National Standards Institute (ANSI) standards and would carry markings, numbers, or certificates of approval. Respirators must meet NIOSH and Cal/OSHA standards. Each employee must be provided with the following information pertaining to the protective clothing and equipment:

- proper use, maintenance, and storage;
- when to use the protective clothing and equipment;
- benefits and limitations; and
- when and how to replace the protective clothing and equipment.

The PPE Program ensures that employers comply with the applicable requirements for PPE and provides employees with the information and training necessary to protect them from potential workplace hazards.

Emergency Action Plan

California regulations require an Emergency Action Plan (8 Cal Code Regs. § 3220). The AFC contains a satisfactory outline for an emergency action plan (HBEP 2012a, § 5.16.3.3.2).

The outline lists plans to accomplish the following:

- establish emergency escape procedures and emergency escape route for the facility;
- determine procedures to be followed by employees who remain to operate critical plant operations before they evacuate;
- provide procedures to account for all employees and visitors after emergency evacuation of the plant has been completed;
- specify rescue and medical duties for assigned employees;
- identify fire and emergency reporting procedures to regulatory agencies;
- develop alarm and communication system for the facility;
- establish a list of personnel to contact for information on the plan contents;
- provide emergency response procedures for ammonia release; and
- determine and establish training and instruction requirements and programs.

Written Safety Program

In addition to the specific plans listed above, additional LORS called *safe work practices* apply to the project. Both the Construction and the Operations Safety Programs would address safe work practices under a variety of programs. The components of these programs include, but are not limited to, the programs found under the heading "**CONSTRUCTION SAFETY AND HEALTH PROGRAM**" in this **Worker Safety and Fire Protection** section.

Safety Training Programs

Employees would be trained in the safe work practices described in the above-referenced safety programs.

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

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

- lack of posted confined space warning placards/signs;
- confusing and/or inadequate electrical and machinery lockout/tagout permitting and procedures;
- confusing and/or inappropriate procedures for handing over lockout/tagout and confined space permits from the construction team to commissioning team and then to operations;
- dangerous placement of hydraulic elevated platforms under each other;
- inappropriate placement of fire extinguishers near hotwork;
- dangerous placement of numerous power cords in standing water on the site, thus increasing the risk of electrocution;
- construction of an unsafe aqueous ammonia unloading pad;
- 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 construction, commissioning, and the hand-over to operational status. These requirements are outlined in Condition of Certification **WORKER SAFETY-4**. A Safety Monitor, hired by the project owner, yet reporting to the Chief Building Official (CBO) and CPM, will serve as an “extra set of eyes” to ensure that safety procedures and practices are fully implemented at all power plants certified by the Energy Commission. During the audits conducted by staff, most site safety professionals welcomed the audit team and actively engaged 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.

Fire Hazards

During construction and operation of the proposed HBEP, there is the potential for both small fires and major structural fires. Electrical sparks, combustion of fuel oil, natural gas, hydraulic fluid, mineral oil, insulating fluid at the power plant switchyard or flammable liquids, explosions, and over-heated equipment, may cause small fires. Major structural fires in areas without automatic fire detection and suppression systems are unlikely to develop at power plants. Fires and explosions of natural gas or other flammable gasses or liquids are rare. Compliance with all LORS would be adequate to assure protection from all fire hazards.

Staff reviewed the information provided in the AFC and applicant’s response to staff’s data requests to determine if HBFD’s available fire protection services and equipment would adequately protect workers and to determine the project’s impact on fire protection services in the area. The project will rely on both on-site fire protection systems and local fire protection services. The on-site 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 provided by the HBFD (HBEP 2012a section 2.1.13, and HBEP 2012n, Data Request #72).

Construction

During construction, portable fire extinguishers would be placed throughout the site at appropriate intervals and periodically maintained, and safety procedures and training would be implemented according to the guidelines of the Construction Fire Protection and Prevention Program (HBEP 2012a, § 2.3.2.4). In addition, the HBEP proposed site is within the area of the existing Huntington Beach Power Station, which has an existing hydrant system that could provide extra protection during construction.

Operation

The information in the AFC indicates that the project intends to meet the fire protection and suppression requirements of the 2010 California Fire Code, all applicable recommended NFPA standards (including Standard 850 addressing fire protection at electric generating plants), and all Cal/OSHA requirements. Fire suppression elements in the proposed plant would include both fixed and portable fire extinguishing systems. The fire protection water system would comprise the existing hydrant system and any needed extensions needed for new HBEP structures. Any new fire hydrants would be installed per NFPA requirements. The fire water would be potable city water supplied by the fire protection tank with water pressure maintained by a jockey pump, an electric pump, and a diesel-driven pump (HBEP 2012a, § 2.5.3.1).

Fixed water fire suppression systems would be installed in areas of risk including the, fire pumps, steam turbine areas, turbine lube-oil systems, and step-up transformers. A carbon dioxide or dry chemical fire protection system would be provided for the combustion turbine generators and accessory equipment compartments (HBEP 2012a, § 2.5.3.1).

The fire protection system would have fire detection sensors and monitoring equipment that would trigger alarms and automatically actuate the suppression systems. In addition to the fixed fire protection system, appropriate class of service portable extinguishers and fire hydrants/hose stations would be located throughout the facility at code-approved intervals (HBEP 2012a, § 2.3.1.1.2). These systems are standard requirements by the NFPA, and the California Fire Code, and staff has determined that they will ensure adequate fire protection.

Staff determined that the AFC was silent in one fire protection-related area, that which pertains to fire department access to the site. All power plants licensed by the Energy Commission are required to have more than one access point to the power plant site. This is sound fire safety procedure and allows for fire department vehicles and personnel to access the site should the main gate be blocked for any reason. However, it is not apparent from the proposed plot-plans that the project will provide two access points during operations and the AFC makes no mention of a secondary access point through the perimeter fence. A second access point is necessary to ensure fire department access and this access point can be restricted to emergency use only. Therefore, in order to ensure the adequate emergency access to the site by the fire department, staff proposes a Condition of Certification **WORKER SAFETY-6** that would require the project owner to identify and provide a second access point to the site for emergency vehicles and to provide access roads with minimum 26 foot width, and with turns and corners having minimum inner and outer radii of 17 and 45 feet, respectively, to meet the requirements of the Huntington Beach Municipal Code and City Specification #401. The plan for the secondary access and access roads would be submitted to HBFD for review and comment, and to the CPM for review and approval.

The applicant would be required by Conditions of Certification **WORKER SAFETY-1** and**-2** to provide the final Fire Protection and Prevention Program to staff and to the HBFD prior to construction and operation of the project to confirm the adequacy of 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 proposes Condition of Certification **WORKER SAFETY-5,** which would require that this portable AED be located on site, that all power plant employees on site during operations be trained in its use, and that a representative number of workers on site during construction and commissioning also be trained in its use.

CUMULATIVE IMPACTS AND MITIGATION

Staff reviewed the potential for the construction and operation of the HBEP combined with existing industrial facilities and expected new facilities to result in impacts on the fire and emergency service capabilities of the HBFD and found that there was no significant potential for cumulative impacts to occur.

Based upon staff's experience with power plants around the state, staff concludes that while it is <u>possible</u> that during a major earthquake (or other major event) response to the power plant could impact on the Huntington Beach Fire Department, the <u>probability</u> of that happening is less than significant. Therefore, this project would not have a significant incremental or cumulative impact on the department's ability to respond to a fire or other emergency and no mitigation is required.

The Huntington Beach Fire Department has stated that its ability to respond to emergency calls will not be affected by the construction and operation of the HBEP. Therefore, staff agrees with the applicant that mitigation is not required (HBEP 2012n).

RESPONSE TO AGENCY AND PUBLIC COMMENTS

Comment: The city of Huntington Beach provided comments from the Huntington Beach Fire Department in the form of a Code Requirements letter regarding standard codes on fire safety and hazardous materials management, which identified specific city of Huntington Beach Municipal and Fire codes and specifications which would apply to the proposed project (CHB 2012a).

Response: Staff agrees and notes that the project would be built to comply with all local laws, ordinances, regulations, and standards (LORS). Notations to the local LORS have been added to the LORS table (**Worker Safety and Fire Protection Table 1**) in this staff assessment.

COMPLIANCE WITH LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

Staff concludes that construction and operation of the HBEP would be in compliance with all applicable laws, ordinances, regulations, and standards (LORS) regarding long-term and short-term project impacts in the area of worker safety and fire protection.

CONCLUSIONS

Staff concludes that if the applicant for the proposed HBEP provides a Project Construction Safety and Health Program and a Project Operations and Maintenance Safety and Health Program as required by Conditions of Certification **WORKER SAFETY-1**, and **-2** and fulfils the requirements of Condition of Certification **WORKER SAFETY-3** through **-5**, the project would incorporate sufficient measures to ensure adequate levels of industrial safety and comply with applicable LORS. Staff also concludes that the operation of this power plant would not present a significant cumulative impact on the local fire department and therefore mitigation is not required.

PROPOSED CONDITIONS OF CERTIFICATION

WORKER SAFETY-1 The project owner shall submit to the compliance project manager (CPM) a copy of the Project Construction Safety and Health Program containing the following:

- a Construction Personal Protective Equipment Program;
- a Construction Exposure Monitoring Program;
- a Construction Injury and Illness Prevention Program;
- a Construction Emergency Action Plan; and
- a Construction Fire Prevention Plan.

The Personal Protective Equipment Program, the Exposure Monitoring Program, 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 Construction Emergency Action Plan and the Fire Prevention Plan shall be submitted to the Huntington Beach Fire Department for review and comment prior to submittal to the CPM for approval.

Verification: At least 30 days prior to the start of construction, the project owner shall submit to the CPM for review and approval a copy of the Project Construction Safety and Health Program. The project owner shall provide a copy of a letter to the CPM from the Huntington Beach Fire Department stating the fire department's timely comments on the Construction Fire Prevention Plan and Emergency Action Plan.

WORKER SAFETY-2 The project owner shall submit to the CPM a copy of the Project Operations and Maintenance Safety and Health Program containing the following:

- an Operation Injury and Illness Prevention Plan;
- an Emergency Action Plan;
- Hazardous Materials Management Program;
- Fire Prevention Plan (8 Cal Code Regs. § 3221); and
- Personal Protective Equipment Program (8 Cal Code Regs, §§ 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 approval 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 Huntington Beach Fire Department for review and comment.

Verification: At least 30 days prior to the start of first-fire or commissioning, the project owner shall submit to the CPM for approval a copy of the Project Operations and Maintenance Safety and Health Program. The project owner shall provide a copy of a letter to the CPM from the Huntington Beach Fire Department stating the fire department's timely comments on the Operations Fire Prevention Plan and Emergency Action Plan.

WORKER SAFETY-3 The project owner shall provide a site Construction Safety Supervisor (CSS) who, by way of training and/or experience, is knowledgeable of power plant construction activities and relevant laws, ordinances, regulations, and standards; is capable of identifying workplace hazards relating to the construction activities; and has authority to take appropriate action to assure compliance and mitigate hazards. The CSS shall:

- have overall 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 and federal regulations related to power plant projects;
- assure that all construction and commissioning workers and supervisors receive adequate safety training;
- complete accident and safety-related incident investigations and emergency response reports for injuries and inform the CPM of safety-related incidents; and
- assure that all the plans identified in Conditions of Certification Worker Safety-1 and -2 are implemented.

Verification: At least 60 days prior to the start of site mobilization, the project owner shall submit to the CPM the name and contact information for the Construction Safety Supervisor (CSS). The contact information of any replacement CSS shall be submitted to the CPM within one business day.

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

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

WORKER SAFETY-4 The project owner shall make payments to the Chief Building Official (CBO) for the services of a Safety Monitor based upon a reasonable fee schedule to be negotiated between the project owner and the CBO. Those services shall be in addition to other work performed by the CBO. The Safety Monitor shall be selected by and report directly to the CBO and will be responsible for verifying that the Construction Safety Supervisor, as required in Condition of Certification Worker Safety-3, implements all appropriate Cal/OSHA and Energy Commission safety requirements. The Safety Monitor shall conduct on-site (including linear facilities) safety inspections at intervals necessary to fulfill those responsibilities.

Verification: At least 60 days prior to the start of construction, the project owner shall provide proof of its agreement to fund the Safety Monitor services to the CPM for review and approval.

WORKER SAFETY-5 The project owner shall ensure that a portable automatic external defibrillator (AED) is located on site during construction and operations and shall implement a program to ensure that workers are properly trained in its use and that the equipment is properly maintained and functioning at all times. During 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 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 60 days prior to the start of site mobilization, the project owner shall submit to the CPM proof that a portable automatic external defibrillator (AED) exists on site and a copy of the training and maintenance program for review and approval.

WORKER SAFETY-6 The project owner shall prepare an Emergency Access Plan that shows all of the following: (1) a 26-foot wide fire lane that will provide a continuous loop around HBEP Block 1; (2) a 26-foot wide fire lane that will provide a continuous loop around HBEP Block 2; (3) a 26-foot wide fire lane from the HBEP main entrance to the continuous loops referenced in (1) and (2) above; and (4) a 26-foot wide fire lane from a secondary access point to the continuous loops referenced in (1) and (2) above. Both access lanes shall connect to a public street. The 26-foot wide fire lanes shall meet the applicable requirements of the California Fire Code, City of Huntington Beach Municipal Code Chapter 17.56 - Huntington Beach Fire Code, and the Huntington Beach Fire Department City Specifications.

Verification: At least 60 days prior to the start of construction of any structures or components listed in the CBO-approved master drawing and master specification list, or within a timeframe approved by the CPM, the project owner shall submit the Emergency Access Plan to the City Fire Department for review and timely comment, and to the CPM and CBO for review and approval.

REFERENCES

California Fire Code 2010. Published by the International Code Council (ICC). Whittier, CA.

CHB 2012a – City of Huntington Beach / Dept of Planning & Building / Aaron Klemm / Jane James (tn 68804). City of Huntington Beach Comments on the Huntington Beach Energy Project, dated 12/06/2012. Submitted to CEC/ Dockets on 12/07/2012.

HBEP 2012a – AES Southland Development, LLC / Stephen O'Kane (tn 66003). A*pplication for Certification (AFC), Volume I & II, dated, June 27, 2012*. Submitted to CEC/ Dockets on 06/27/2012.

HBEP 2012n – Stoel Rives LLP / Melissa A. Foster (tn 68366). *Applicant's Responses to Staff's Data Requests, Set 1A (#1-72), dated, 11/02/2012.* Submitted to CEC/ Dockets on 11/02/2012.

Engineering Assessment

FACILITY DESIGN

Testimony of Edward Brady and Shahab Khoshmashrab

SUMMARY OF CONCLUSIONS

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. The proposed conditions of certification, below, would ensure compliance with these laws, ordinances, regulations and standards.

INTRODUCTION

Facility design encompasses the civil, structural, mechanical, and electrical engineering design of the Huntington Beach Energy Project (HBEP). The purpose of this analysis is to:

- Verify that the laws, ordinances, regulations and standards (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 applicant’s proposed design criteria, including identification of criteria essential to public health and safety;
- Proposed modifications and additions to the application for certification (AFC) necessary for compliance with applicable engineering LORS; and
- Conditions of certification proposed by 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 AFC (HBEP 2012a, AFC Appendix 2C). 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 Huntington Beach 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 Huntington Beach 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 by the project. The LORS listed under this heading are only some of the key engineering standards applicable to the project; for a comprehensive list of engineering LORS, please see AFC Appendix 2C.

SETTING

HBEP would be built on the existing site of the AES Huntington Beach Generating Station, an existing and operating power plant in Huntington Beach. For more information on the site and its related project description, please see the **PROJECT DESCRIPTION** section of this document. Additional engineering design details are contained in the AFC, Appendix 2C (HBEP 2012a).

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 applicant'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 California Energy Commission (Energy Commission) compliance project manager (CPM) and the applicant 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 applicant proposes the use of accepted industry standards (see HBEP 2012a, Appendix 2C, 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.

HBEP will 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.

On April 7, 2014, the City of Huntington Beach City Council adopted Resolution No. 2014-18 containing a visual screening and enhancement plan for HBEP (tn 202084). This resolution recommends that three architectural surfboards and three architectural wave forms, each approximately 125 feet tall, be installed on the HBEP power blocks. For visual rendering of these features, please see **Visual Resources Figures 16**, **17**, and **18** in the **VISUAL RESOURCES** section of this document. The **VISUAL RESOURCES** section requires the implementation of these features. These project features would be large enough to become potential safety hazards if not constructed according to applicable engineering LORS. Therefore, it is imperative that their structural soundness be reviewed and approved by the CBO prior to their physical implementation. The master drawings and master specifications list described in Condition of Certification **GEN-2**, below, lists the documents that must be reviewed and approved by the CBO. The architectural visual enhancement features described above must be included in this list. Thus, staff has revised **GEN-2** accordingly to ensure these features will undergo the CBO's review and approval process.

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

The applicant describes a quality program intended to inspire confidence that its systems and components will be designed, fabricated, stored, transported, installed, and tested in accordance with all appropriate power plant technical codes and standards (HBEP 2012a, AFC § 3.12.6, Appendix 2C). Compliance with design requirements will be verified through specific inspections and audits. Implementation of this quality assurance/quality control (QA/QC) program will ensure that HBEP is actually designed, procured, fabricated, and installed as described in this analysis.

COMPLIANCE MONITORING

Under 2013 CBC, Division II, Section 104, 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 applicant, 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 applicant pays in lieu of CBC permit fees to cover the costs of these reviews and inspections.

Engineering and compliance staff will invite 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 developed proposed conditions of certification to ensure for 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 will design and build the proposed project (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 applicant 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

The removal of a facility from service (decommissioning) when it reaches the end of its useful life ranges from "mothballing," to the removal of all equipment and appurtenant facilities and subsequent restoration of the site. Future conditions that could affect decommissioning are largely unknown at this time.

In order to ensure that decommissioning will be completed in a manner that is environmentally sound, safe, and protects the public health and safety, the applicant shall submit a decommissioning plan to the Energy Commission for review and approval before the project's decommissioning begins. The plan shall include a discussion of:

- Proposed decommissioning activities for the project and all appurtenant facilities that were constructed as part of the project;
- All applicable LORS, local/regional plans, and proof of adherence to those applicable LORS and local/regional plans;
- The activities necessary to restore the site if the plan requires removal of all equipment and appurtenant facilities; and
- Decommissioning alternatives other than complete site restoration.

Satisfying the above requirements should serve as adequate protection, even in the unlikely event that the project is abandoned. Staff has proposed general conditions (see **COMPLIANCE CONDITIONS**) to ensure that these measures are included in the Facility Closure Plan.

CONCLUSIONS AND RECOMMENDATIONS

1. The laws, ordinances, regulations and standards (LORS) identified in the AFC and supporting documents directly apply to the project.

2. Staff has evaluated the proposed engineering LORS, design criteria, and design methods in the record, and concludes that the design, construction, and eventual closure of the project will likely comply with applicable engineering LORS.

3. The proposed conditions of certification will ensure that HBEP, including the project's visual enhancement features described above under **MAJOR STRUCTURES, SYSTEMS, AND EQUIPMENT** are 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.

4. Though future conditions that could affect decommissioning are largely unknown at this time, it can reasonably be concluded that if the project owner submits a decommissioning plan as required in the **COMPLIANCE CONDITIONS** portion of this document prior to decommissioning, decommissioning procedures will comply with all applicable engineering LORS.

Energy Commission staff recommends that:

1. The proposed 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 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

GEN-1 The project owner shall design, construct, and inspect the project in accordance with 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 all other applicable engineering LORS in effect at the time initial design plans are submitted to the CBO for review and approval (the CBSC in effect is the edition that has been adopted by the California Building Standards Commission and published at least 180 days previously). The project owner shall ensure that all the provisions of the above applicable codes are enforced during the construction, addition, alteration, moving, demolition, repair, or maintenance of the completed facility. All transmission facilities (lines, switchyards, switching stations and substations) are covered in the conditions of certification in the **TRANSMISSION SYSTEM ENGINEERING** section of this document.

In the event that the initial engineering designs are submitted to the CBO when the successor to the 2013 CBSC is in effect, the 2013 CBSC provisions shall be replaced with the applicable successor provisions. Where, in any specific case, different sections of the code specify different materials, methods of construction or other requirements, the most restrictive shall govern. Where there is a conflict between a general requirement and a specific requirement, the specific requirement shall govern.

The project owner shall ensure that all contracts with contractors, subcontractors, and suppliers clearly specify that all work performed and materials supplied comply with the codes listed above.

Verification: Within 30 days following receipt of the certificate of occupancy, the project owner shall submit to the CPM a statement of verification, signed by the responsible design engineer, attesting that all designs, construction, installation, and inspection requirements of the applicable LORS and the Energy Commission’s decision have been met in the area of facility design. The project owner shall provide the CPM a copy of the certificate of occupancy within 30 days of receipt from the CBO.

Once the certificate of occupancy has been issued, the project owner shall inform the CPM at least 30 days prior to any construction, addition, alteration, moving, demolition, repair, or maintenance to be performed on any portion(s) of the completed facility that requires CBO approval for compliance with the above codes. The CPM will then determine if the CBO needs to approve the work.

GEN-2 Before submitting the initial engineering designs for CBO review, the project owner shall furnish the CPM and the CBO with a schedule of facility design submittals, and master drawings and master specifications list. The master drawings and master specifications list shall contain a list of proposed submittal packages of designs, calculations, and specifications for major structures, systems, and equipment, including the architectural visual enhancement specified in the **VISUAL RESOURCES** section. 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 schedule shall contain the date of each submittal to the CBO. To facilitate audits by Energy Commission staff, the project owner shall provide specific packages to the CPM upon request.

Verification: At least 60 days (or a project owner- and CBO-approved alternative time frame) prior to the start of rough grading, the project owner shall submit to the CBO and to the CPM the schedule, and the master drawings and 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, systems, equipment, and the architectural enhancement features defined above in Condition of Certification **GEN-2**. Major structures and equipment shall be added to or deleted from the list only with CPM approval. The project owner shall provide schedule updates in the monthly compliance report.

GEN-3 The project owner shall make payments to the CBO for design review, plan checks, and construction inspections, 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 CBC, 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 otherwise agreed upon 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 applicable fees have been paid.

GEN-4 Prior to the start of rough grading, the project owner shall assign a California-registered architect, or a structural or civil engineer, as the resident engineer (RE) in charge of the project. All transmission facilities (lines, switchyards, switching stations, and substations) are addressed in the conditions of certification in the **TRANSMISSION SYSTEM ENGINEERING** section of this document.

The RE may delegate responsibility for portions of the project to other registered engineers. Registered mechanical and electrical engineers may be delegated responsibility for mechanical and electrical portions of the project, respectively. A project may be divided into parts, provided that each part is clearly defined as a distinct unit. Separate assignments of general responsibility may be made for each designated part.

The RE shall:

1. Monitor progress of construction work requiring CBO design review and inspection to ensure compliance with LORS;

2. Ensure that construction of all facilities subject to CBO design review and inspection conforms in every material respect to applicable LORS, these conditions of certification, approved plans, and specifications;

3. Prepare documents to initiate changes in approved drawings and specifications when either directed by the project owner or as required by the conditions of the project;

4. Be responsible for providing project inspectors and testing agencies with complete and up-to-date sets 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 when they do not conform to approved plans and specifications.

The resident engineer (or his delegate) must be located at the project site, or be available at the project site within a reasonable period of time, during any hours in which construction takes place.

The RE shall have the authority to halt construction and to require changes or remedial work if the work does not meet requirements.

If the RE or the delegated engineers are reassigned or replaced, the project owner shall submit the name, qualifications and registration number of the newly assigned engineer to the CBO for review and approval. The project owner shall notify the CPM of the CBO’s approval of the new engineer.

Verification: At least 30 days (or project owner- and CBO-approved alternative time frame) prior to the start of rough grading, the project owner shall submit to the CBO for review and approval, the resume 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) is subsequently reassigned or replaced, the project owner has five days to submit the resume and registration number of the newly assigned engineer to the CBO for review and approval. The project owner shall notify the CPM of the CBO's approval of the new engineer within five days of the approval.

GEN-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 civil engineer; a soils, geotechnical, or civil engineer experienced and knowledgeable in the practice of soils engineering; and an engineering geologist. Prior to the start of construction, the project owner shall assign at least one of each of the following California registered engineers to the project: 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; a mechanical engineer; and an electrical engineer. (California Business and Professions Code section 6704 et seq., and sections 6730, 6731 and 6736 require state registration to practice as a civil engineer or structural engineer in California). All transmission facilities (lines, switchyards, switching stations, and substations) are handled in the conditions of certification in the **TRANSMISSION SYSTEM ENGINEERING** section of this document.

The tasks performed by the civil, mechanical, electrical, or design engineers may be divided between two or more engineers, as long as each engineer is responsible for a particular segment of the project (for example, 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.

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. Review the foundation investigations, geotechnical, or soils reports prepared by the soils engineer, the geotechnical engineer, or by a civil engineer experienced and knowledgeable in the practice of soils engineering;

2. Design (or be responsible for the design of), stamp, and sign all plans, calculations, and specifications for proposed site work, civil works, and related facilities requiring design review and inspection by the CBO. At a minimum, these include: grading, site preparation, excavation, compaction, construction of secondary containment, foundations, erosion and sedimentation control structures, drainage facilities, underground utilities, culverts, site access roads and sanitary sewer systems; and

3. Provide consultation to the RE during the construction phase of the project and recommend changes in the design of the civil works facilities and changes to the construction procedures.

B. The soils engineer, geotechnical engineer, or civil engineer experienced and knowledgeable in the practice of soils engineering, shall:

1. Review all the engineering geology reports;

2. Prepare the foundation investigations, geotechnical, or soils reports containing field exploration reports, laboratory tests, and engineering analysis detailing the nature and extent of the soils that could be susceptible to liquefaction, rapid settlement or collapse when saturated under load;

3. Be present, as required, during site grading and earthwork to provide consultation and monitor compliance with requirements set forth in the 2013 CBC (depending on the site conditions, this may be the responsibility of either the soils engineer, the engineering geologist, or both); and

4. Recommend field changes to the civil engineer and RE.

This engineer shall be authorized to halt earthwork and to require changes if site conditions are unsafe or do not conform to the predicted conditions used as the basis for design of earthwork or foundations.

C. The engineering geologist shall:

1. Review all the engineering geology reports and prepare a final soils grading report; and

2. Be present, as required, during site grading and earthwork to provide consultation and monitor compliance with the requirements set forth in the 2013 CBC (depending on the site conditions, this may be the responsibility of either the soils engineer, the engineering geologist, or both).

D. The design engineer shall:

   1. Be directly responsible for the design of the proposed structures and equipment supports;

   2. Provide consultation to the RE during design and construction of the project;

   3. Monitor construction progress to ensure compliance with engineering LORS;

   4. Evaluate and recommend necessary changes in design; and

   5. Prepare and sign all major building plans, specifications, and calculations.

E. The mechanical engineer shall be responsible for, and sign and stamp a statement with, each mechanical submittal to the CBO, stating that the proposed final design plans, specifications, and calculations conform to all of the mechanical engineering design requirements set forth in the Energy Commission's decision.

F. The electrical engineer shall:

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

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

Verification: At least 30 days (or project owner- and CBO-approved alternative time frame) prior to the start of rough grading, the project owner shall submit to the CBO for review and approval, resumes and registration numbers of the responsible civil engineer, soils (geotechnical) engineer and engineering geologist assigned to the project.

At least 30 days (or project owner- and CBO-approved alternative time frame) prior to the start of construction, the project owner shall submit to the CBO for review and approval, resumes and registration numbers of the responsible design engineer, mechanical engineer, and electrical engineer assigned to the project.

The project owner shall notify the CPM of the CBO's approvals of the responsible engineers within five days of the approval.

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

GEN-6 Prior to the start of an activity requiring special inspection, including prefabricated assemblies, 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 CBC. 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 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).

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. Inspect 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, specifications, and other provisions of the applicable edition of the CBC.

Verification: At least 15 days (or project owner- and CBO-approved alternative time frame) prior to the start of an activity requiring special inspection, the project owner shall submit to the CBO for review and approval, with a copy to the CPM, the name(s) and qualifications of the certified weld inspector(s), or other certified special inspector(s) assigned to the project to perform one or more of the duties set forth above. The project owner shall also submit to the CPM a copy of the CBO's approval of the qualifications of all special inspectors in the next monthly compliance report.

If the special inspector is subsequently reassigned or replaced, the project owner has five days in which to submit the name and qualifications of the newly assigned special inspector to the CBO for approval. The project owner shall notify the CPM of the CBO's approval of the newly assigned inspector within five days of the approval.

GEN-7 If any discrepancy in design and/or construction is discovered in any engineering work that has undergone CBO design review and approval, the project owner shall document the discrepancy and recommend required corrective actions. 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, 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. The project owner shall notify the CPM after obtaining the CBO's final approval. The project owner shall retain one set of approved engineering plans, specifications, and calculations (including all approved changes) at the project site or at another accessible location during the operating life of the project. Electronic copies of the approved plans, specifications, calculations, and marked-up as-builts shall be provided to the CBO for retention by the CPM.

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 the final approved engineering plans, specifications, and calculations described above, the project owner shall submit to the CPM a letter stating both that the above documents have been stored and the storage location of those documents.

Within 90 days of the completion of construction, the project owner shall provide to the CBO three sets of electronic copies of the above documents at the project owner's expense. These are to be provided in the form of "read only" (Adobe .pdf 6.0 or newer version) files, with restricted (password-protected) printing privileges, on archive quality compact discs.

CIVIL-1 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. A construction storm water pollution prevention plan (SWPPP);
4. Related calculations and specifications, signed and stamped by the responsible civil engineer; and
5. Soils, geotechnical, or foundation investigations reports required by the 2013 CBC.

Verification: At least 15 days (or project owner- and CBO-approved alternative time frame) prior to the start of site grading 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 earthwork and construction in the affected areas when the responsible soils engineer, geotechnical engineer, or the 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.

Verification: The project owner shall notify the CPM within 24 hours, when earthwork and construction is stopped as a result of unforeseen adverse geologic/soil conditions. Within 24 hours 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 CBC. 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, with copies to the CBO and the CPM, detailing all discrepancies, non-compliance items, and the proposed corrective action.

Verification: Within five days of the discovery of any discrepancies, the resident engineer shall transmit to the CBO and the CPM a non-conformance report (NCR), and the proposed corrective action for review and approval. Within five days of resolution of the NCR, the project owner shall submit the details of the corrective action to the CBO and the CPM. A list of NCRs, for the reporting month, shall also be included in the following monthly compliance report.

CIVIL-4 After completion of finished grading and erosion and sedimentation control and drainage work, the project owner shall obtain the CBO's approval of the final grading plans (including final changes) for the erosion and sedimentation control work. The civil engineer shall state that the work within his/her area of responsibility was done in accordance with the final approved plans.

Verification: Within 30 days (or project owner- and CBO-approved alternative time frame) of the completion of the erosion and sediment control mitigation and drainage work, the project owner shall submit to the CBO, for review and approval, the final grading plans (including final changes) and the responsible civil engineer's signed statement that the installation of the facilities and all erosion control measures were completed in accordance with the final approved combined grading plans, and that the facilities are adequate for their intended purposes. The project owner shall submit a copy of the CBO's approval to the CPM in the next monthly compliance report.

STRUC-1 Prior to the start of any increment of construction, the project owner shall submit plans, calculations and other supporting documentation to the CBO for design review and acceptance for all project structures and equipment identified in the CBO-approved master drawing and master specifications list. The design plans and calculations shall include the lateral force procedures and details as well as vertical calculations.

Construction of any structure or component shall not begin 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 (for example, 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;

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 prior to the start of on-site fabrication and installation of each structure, equipment support, or foundation;

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; and

5. Submit to the CBO the responsible design engineer's signed statement that the final design plans conform to applicable LORS.

Verification: At least 60 days (or project owner- and CBO-approved alternative time frame) prior to the start of any increment of construction of any structure or component listed in the CBO-approved master drawing and master specifications list, the project owner shall submit to the CBO the above final design plans, specifications and calculations, with a copy of the transmittal letter to the CPM.

The project owner shall submit to the CPM, in the next monthly compliance report, a copy of a statement from the CBO that the proposed structural plans, specifications, and calculations have been approved and comply with the requirements set forth in applicable engineering LORS.

STRUC-2 The project owner shall submit to the CBO the required number of sets of the following documents related to work that has undergone CBO design review and approval:

1. Concrete cylinder strength test reports (including date of testing, date sample taken, design concrete strength, tested cylinder strength, age of test, type and size of sample, location and quantity of concrete placement from which sample was taken, and mix design designation and parameters);

2. Concrete pour sign-off sheets;

3. Bolt torque inspection reports (including location of test, date, bolt size, and recorded torques);

4. Field weld inspection reports (including type of weld, location of weld, inspection of non-destructive testing (NDT) procedure and results, welder qualifications, certifications, qualified procedure description or number (ref: AWS); and

5. Reports covering other structural activities requiring special inspections shall be in accordance with the 2013 CBC.

<u>**Verification:**</u> If a discrepancy is discovered in any of the above data, the project owner shall, within five days, prepare and submit an NCR describing the nature of the discrepancies and the proposed corrective action to the CBO, with a copy of the transmittal letter to the CPM. The NCR shall reference the condition(s) of certification and the applicable CBC chapter and section. Within five days of resolution of the NCR, the project owner shall submit a copy of the corrective action to the CBO and the CPM.

The project owner shall transmit a copy of the CBO's approval or disapproval of the corrective action to the CPM within 15 days. If disapproved, the project owner shall advise the CPM, within five days, the reason for disapproval, and the revised corrective action to obtain CBO's approval.

STRUC-3 The project owner shall submit to the CBO design changes to the final plans required by the 2013 CBC, including the revised drawings, specifications, calculations, and a complete description of, and supporting rationale for, the proposed changes, and shall give to the CBO prior notice of the intended filing.

<u>**Verification:**</u> On a schedule suitable to the CBO, the project owner shall notify the CBO of the intended filing of design changes, and shall submit the required number of sets of revised drawings and the required number of copies of the other above-mentioned documents to the CBO, with a copy of the transmittal letter to the CPM. The project owner shall notify the CPM, via the monthly compliance report, when the CBO has approved the revised plans.

STRUC-4 Tanks and vessels containing quantities of toxic or hazardous materials exceeding amounts specified in the 2013 CBC shall, at a minimum, be designed to comply with the requirements of that chapter.

Verification: At least 30 days (or project owner- and CBO-approved alternate time frame) 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 The project owner shall submit, for CBO design review and approval, the proposed final design, specifications and calculations for each plant major piping and plumbing system listed in the CBO-approved master drawing and master specifications list. The submittal shall also include the applicable QA/QC procedures. Upon completion of construction of any such major piping or plumbing system, the project owner shall request the CBO's inspection approval of that construction.

The responsible mechanical engineer shall stamp and sign all plans, drawings, and calculations for the major piping and plumbing systems, subject to CBO design review and approval, and submit a signed statement to the CBO when the proposed piping and plumbing systems have been designed, fabricated, and installed in accordance with all of the applicable laws, ordinances, regulations and industry standards, which may include, but are not limited to:

- American National Standards Institute (ANSI) B31.1 (Power Piping Code);
- ANSI B31.2 (Fuel Gas Piping Code);
- ANSI B31.3 (Chemical Plant and Petroleum Refinery Piping Code);
- ANSI B31.8 (Gas Transmission and Distribution Piping Code);
- NACE R.P. 0169-83;
- NACE R.P. 0187-87;
- NFPA 56;
- 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
- City of Huntington Beach codes.

The CBO may deputize inspectors to carry out the functions of the code enforcement agency.

<u>Verification:</u> At least 30 days (or project owner- and CBO-approved alternative time frame) prior to the start of any increment of major piping or plumbing construction listed in the CBO-approved master drawing and master specifications list, 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 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 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 that installation.

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.

<u>Verification:</u> At least 30 days (or project owner- and CBO-approved alternative time frame) 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 The project owner shall submit to the CBO for design review and approval the design plans, specifications, calculations, and quality control procedures for any heating, ventilating, air conditioning (HVAC) or refrigeration 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 that 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.

Verification: At least 30 days (or project owner- and CBO-approved alternative time frame) 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 all electrical equipment and systems 110 Volts or higher (see a representative list, below) the project owner shall submit, for CBO design review and approval, the proposed final design, specifications, and calculations. 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. 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 shall include:

   1. one-line diagram for the 13.8 kV, 4.16 kV and 480 V systems;

   2. system grounding drawings;

   3. lightning protection system; and

   4. hazard area classification plan.

B. Final plant calculations must establish:

   1. short-circuit ratings of plant equipment;

   2. ampacity of feeder cables;

   3. voltage drop in feeder cables;

   4. system grounding requirements;

   5. coordination study calculations for fuses, circuit breakers and protective relay settings for the 13.8 kV, 4.16 kV and 480 V systems;

6. system grounding requirements;

7. lighting energy calculations; and

8. 110 volt system design calculations and submittals showing feeder sizing, transformer and panel load confirmation, fixture schedules and layout plans.

C. The following activities shall be reported to the CPM in the monthly compliance report:

1. Receipt or delay of major electrical equipment;

2. Testing or energization of major electrical equipment; and

3. A signed statement by the registered electrical engineer certifying that the proposed final design plans and specifications conform to requirements set forth in the Energy Commission decision.

Verification: At least 30 days (or project owner- and CBO-approved alternative time frame) 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

HBEP 2012a – AES Southland Development, LLC / Stephen O'Kane (tn 66003). A*pplication for Certification (AFC), Volume I & II, dated, 06/27/2012*. Submitted to CEC/ Dockets on 06/27/2012.

GEOLOGY AND PALEONTOLOGY

Testimony of Casey Weaver, CEG

SUMMARY OF CONCLUSIONS

The proposed Huntington Beach Energy Project (HBEP) site is located in an active geologic area along the coast of Huntington Beach in Southern California. The site is not underlain by an active fault and the site is not subject to surface fault rupture. The closest known active fault is a segment of the Newport - Inglewood Fault Zone which is located approximately one mile north of the proposed project site. Numerous 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 HBEP structures must be mitigated through structural designs required by the most recent edition of the California Building Code (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 **GEO-2**, and proposed Conditions of Certification **Facility Design GEN-1**, **GEN-5** and **CIVIL-1**, 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 (SSC 2005).

Petroleum is the only economic geologic resource in the project vicinity. Oil was first discovered at Huntington Beach in 1920 (Higgins 1976). Production expanded north to Seal Beach and south into Newport Beach in subsequent years. The main production zones occurred at depth between 2500 feet and 4500 feet below ground surface. It is likely that oil reserves exist below the project site. Other than petroleum, there are no known viable minerologic or geologic resources at the proposed HBEP site.

Due to the underlying oil reserves and possibility of the production of methane gas in native soils, the site and surrounding area has been mapped as being within a Methane Overlay District. Development within a Methane Overlay District must abide by the city of Huntington Beach Methane District Building Permit Requirements. City of Huntington Beach Specification No. 429 and proposed Condition of Certification **GEO-2** would require evaluation of the potential for, and mitigation of, the presence of methane gas beneath the proposed site.

Fossils have not been found in close proximity to the project site. A search of the University of California (at Berkeley) Museum of Paleontology's (UCMP) database was conducted by the applicant on January 4, 2012. No records for fossils within 1 mile of the project site were found, and no further records of fossils within the city of Huntington Beach are known (HBEP 2012a). Potential impacts to paleontological resources due to construction activities are not likely, but if discovered during construction, they would be mitigated through worker training and monitoring by qualified paleontologists, as required by proposed Conditions of Certification **PAL-1** through **PAL-8**.

Based on this information, Energy Commission staff believes that the potential adverse cumulative impacts to project facilities from geologic hazards during their 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 HBEP can be designed and constructed in accordance with all applicable laws, ordinances, regulations, and standards (LORS), and in a manner that both protects environmental quality and assures public safety.

INTRODUCTION

In this section, California Energy Commission (Energy Commission) staff discusses the potential impacts of geologic hazards on the proposed HBEP facility as well as the HBEP'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 - *i.e.*, monitoring and mitigation measures that, if implemented, would reduce any project impacts to geologic hazards and geologic, mineralogic, and paleontologic resources to insignificant levels.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)

Applicable laws, ordinances, regulations and standards (LORS) are listed in the application for certification (AFC) (HBEP 2012a). 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 LORS	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.
Local	
City of Huntington Beach General Plan	The city of Huntington Beach addresses public safety and welfare in the city through implementation of its General Plan and compliance with applicable local regulations stated in the *Huntington Beach Municipal Code*. General Plan policies specific to geologic, soil, and seismic hazards are listed in the Environmental Hazards Element.
Huntington Beach Municipal Code and Grading Ordinance	The city adopted the 2010 CBC as the basis for its own Building Code. Site development work in the city is required to comply with the *Huntington Beach Building Code* and all State requirements pertaining to geologic, soil, and seismic hazards. The Grading and Excavation Code sets forth rules and regulations to control excavation, grading, earthwork and site improvement construction, and establishes administrative requirements for issuance of permits and approvals of plans and inspection of grading and construction.
Huntington Beach Municipal Code City Specification 429 Methane District Building Permit Requirements	The city of Huntington Beach strongly recommends not building structures over or near abandoned oil well or petroleum contaminated soil. City Specification 429 directs the assessment of and provides mitigation measures for areas proposed for construction where methane gas in soil is likely to occur.
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 HBEP project will be on the site of the existing Huntington Beach Generating Station (HBGS), an operating electrical generation facility on the Pacific coast in Orange County, California (**Geology and Paleontology - Figure 1**). The site is approximately 31 miles southeast of Los Angeles and approximately 80 miles northwest of San Diego, California. As detailed in the **PROJECT DESCRIPTION** section of this FSA, the HBEP will be a 939-megawatt combined-cycle power plant, consisting of two power blocks. Each power block will be composed of three combustion turbines with supplemental fired heat-recovery steam generators, a steam-turbine generator, an air-cooled condenser, and ancillary facilities. HBEP will reuse existing pipelines to convey onsite potable water, natural gas, storm water, process wastewater, and sanitary wastewater and existing facilities to transmit electricity. No offsite linear developments are proposed as part of the project.

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 (Yeats2010). 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).

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 boundary of the Southwest Block and Central Block, near the Newport-Inglewood fault zone (Ninyo 2011). According to State of California Division of Oil, Gas, and Geothermal Resources Map 136, the project site and surrounding area are situated within the West Newport Oil Field (**Geology and Paleontology - Figure 2**). The West Newport Oil Field is part of the larger Huntington Beach oil field, which is associated with what is referred to as the Newport-Inglewood Structural Trend (Magorien 2002). A number of other significant oil fields are located along the Newport-Inglewood Structural Trend, all of which owe their existence to the Newport-Inglewood fault. Associated with the Newport-Inglewood fault zone is the San Joaquin Blind Thrust (Grant 2002). The San Joaquin Blind Thrust is responsible for the formation of the San Joaquin anticline that stretches from Dana Point to Seal Beach.

The San Joaquin Blind Thrust has uplifted marine sediments forming the Newport and the Huntington Mesas. It is likely that anticlinal folding along the San Joaquin Blind Thrust diverted the Santa Ana River from maintaining its flow through Newport Bay, causing it to be deflected around the westward plunging nose of the anticline westerly to the area around Fountain Valley (Mueller 2005).

After being deflected from its course flowing through Newport Bay, the Santa Ana River cut its way through the lower, slower uplifting western limb of the anticline forming a water gap in the area between Huntington Beach and Newport Beach (**Geology and Paleontology - Figure 3**). The project site is located within this gap, locally referred to as the Santa Ana Gap (Magorien 2002).

The erosion that created the gap began in Late Pleistocene (approximately 60,000 years ago) and continued until the end of the last glacial period approximately 11,000 years ago. The combination of a lowered sea level and accelerated stream erosion produced a river valley that grew to approximately 200 feet deep and several miles wide (Magorien 2002). At the end of the glacial period, the sea level began to rise and the ancestral river began backfilling the valley eventually forming the existing coastal plain on which the site is located.

The coastal plain contains coastal alluvial deposits (gravels, sands, and silts), aeolian deposits (well sorted fine grain windblown sand), estuarian deposits (organic silts and clays) and near shore marine deposits (predominantly well sorted medium grain sand) (Ninyo 2011).

PROJECT SITE DESCRIPTION

The HBEP site is located in the coastal zone of southern California in an industrial area of Huntington Beach, just north of the intersection of the Pacific Coast Highway (Highway 1) and Newland Street. The HBEP site is bounded on the west by a manufactured home/recreational vehicle park, on the north by a derelict tank farm, on the north and east by the Huntington Beach Channel and residential areas, on the southeast by the Huntington Beach Wetland Preserve/Magnolia Marsh wetlands, and to the south and southwest by the Huntington Beach State Park and the Pacific Ocean **Geology and Paleontology - Figure 4**).

The project is located on the site of the existing Huntington Beach Generating Station, an operating electrical generation facility. The site currently consists of four parcels of land with four power generating units comprising a total of approximately 46.23 acres. Each unit comprises a control room, boiler, turbine and other support facilities. The entire site is covered with asphalt or concrete pavement.

As part of the preliminary on-site geotechnical investigation, 2 small diameter exploratory borings were drilled and 4 Cone Penetration Tests (CPT) were driven in the east central portion of the site (Ninyo 2011). The borings were drilled to maximum depths of 51.5 feet below ground surface (bgs) and the CPTs were driven to final depths of approximately 75.5 feet.

Groundwater was observed at a depth of 14 feet bgs in the borings. However, this observation was not considered to be representative of stabilized ground water conditions (Ninyo 2011). As presented in the Preliminary Geotechnical Report, groundwater has historically been as high as 3 feet bgs in the site vicinity. It is likely that the reference to depth to groundwater described in the Ninyo & Moore report was based on measurements using the natural ground surface at the datum from which the measurements were made, rather than the elevated fill surface of the project site.

Based on the grading plans presented in the AFC, the elevation of the site in the vicinity of the Ninyo & Moore investigation is approximately 12 feet above sea level (HBEP 2012a). Therefore, Ninyo & Moore's measured non stabilized depth to water of 14 feet below ground surface would equate to a groundwater elevation of approximately 2 feet below sea level.

Due to the site's location adjacent to the ocean and the porous nature of the underlying sediments, it is likely that site soils are saturated with sea water at an elevation equal to mean sea level. Freshwater is less dense than sea water. Therefore, assuming a blanket of freshwater is "floating" on the seawater saturated soils, it is likely that the stabilized groundwater elevation is at least 2 feet above mean sea level. Fluctuations in the depth to groundwater are likely to occur due to tidal variations, seasonal precipitation, variation in surface elevations, groundwater pumping (dewatering), and projected sea level rise.

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 applicant, to determine if geologic and mineralogic resources exist in the area.

To assess potential impacts on paleontological resources, staff reviewed existing paleontologic information and reviewed the information obtained from the applicant's requested records searches from the San Bernardino County Museum for the surrounding area. The UCMP website, which gives generalized information for locality records of their collection, and site-specific information generated by the applicant for the proposed HBEP, was also reviewed. All research was conducted in accordance with accepted assessment protocol (BLM 2008 and SVP 2010) to determine whether any known paleontologic resources exist in the general area. If present or likely to be present, conditions of certification which outline required procedures to mitigate adverse affects to potential resources are proposed as part of the 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, hydro compaction, 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 applicant 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

At the HBEP site, the geologic units at the surface and in the subsurface are widespread alluvial deposits that occur throughout the Huntington Beach area (**Geology and Paleontology - Figure 5).** These geologic units are not unique in terms of recreational, commercial, or scientific value.

The Huntington Beach area has been the site of the extraction of oil and gas, sand and gravel, and peat products over many years. Large-scale oil and gas production has occurred since the 1920s and continues to the present time.

According to online maps of the California Division of Oil, Gas and Geothermal Resources (DOGGR 2012), oil and natural gas deposits are present in the wider project area. The city of Huntington Beach lies over several oil producing areas, comprising the Talbert, Sunset Beach, West Newport, and Huntington Beach oil fields. These oil fields and several others associated with the Newport Inglewood Fault Zone have produced more than five billion barrels of oil (Higgins 1976). Oil and gas wells in Huntington Beach are scattered throughout much of the city. Most are concentrated along the coastal areas and mesas of the city. Recently, oil production has decreased due to dwindling capacity in local oil reserves and the expenses incurred in oil extraction (Higgins 1976). The HBEP site specifically overlies the West Newport oil field. Within this field, there are many plugged or abandoned wells located near the project site.

Abandoned wells within 2 miles of the project site are shown on **Geology and Paleontology - Figure 6**.

R.W. McClellan and Sons operated a peat production facility in the site vicinity from 1941 to 1954 (Huntington 1996a). Their operation ceased when the city of Huntington Beach acquired the property in 1954. No further mining of peat or other soil conditioners is known to occur at the present time (Huntington 1996a).

In 1982, the California Division of Mines and Geology published a comprehensive mineral land classification for aggregate materials in the Orange County area. Based on this investigation, the HBEP site is mapped as an area with no aggregate significance. The Resources Element of the Orange County General Plan indicates that significant mineral deposits are not present in the project area (Orange 2011). Based on the Orange County General Plan (Orange 2011) and the city of Huntington Beach General Plan (Huntington 1996a), no known active areas of mining for mineral resources occur near the HBEP site.

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

The project site is mantled with approximately five to ten feet of artificial fill material. Beneath the fill are native soils consisting of alluvial, estuarine and marine sediments. The upper 60 feet of the native soils consist of Holocene coastal marine sediments ranging in age from 8,600 years old to the present (Magorien 2002). At a depth between 60 and 90 feet, the marine sediments are considered to be middle to late Holocene in age (8,600–11,000 years ago) (Magorien 2002).

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 Sand (BonTerra 2010). The San Pedro Sand consists of gray to dark gray to reddish-yellow (rust)-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).

During the course of the field reconnaissance conducted for the nearby Banning Ranch project (BonTerra 2010), three shell bearing fossiliferous sites were found in deposits mapped as San Pedro Sand. The fossil sites represent the first recognized fossils from the San Pedro Sand in Orange County (BonTerra 2010).

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.

Chiefly marine Pleistocene, Pliocene, and Miocene rocks and sediments extend several thousand feet below these upper units. These deeper, older units are important for oil and natural gas production, but occur at depths below those likely to be reached during construction of the HBEP (BonTerra 2010). Further below these units, at over 9,000 feet bgs, lies highly weathered crystalline basement rock of presumed Jurassic age (Bon Terra 2010).

A search of the UCMP and PaleoBiology databases was conducted by the applicant on January 4, 2012 (HBEP 2012a). Regionally, vertebrate fossils are recorded from the Pico, Repetto, Puente, and Topanga formations. These include the remains of mammals, birds, and fish. Because these units are unknown in the project vicinity, and therefore unlikely to be encountered during construction, they were not analyzed in detail.

The database search also specifically queried Quaternary fossil site records within Orange County. Over 900 fossil sites have been found in the county. Most of the sites are located far from the project site. However, numerous coastal sites within 5 miles of the project area, including Seal Beach, Bolsa Bay, Sunset Beach, and Newport Bay have produced invertebrate and limited vertebrate fossil faunas (BonTerra 2010). The results are predominately Holocene invertebrate fossils and therefore, do not represent paleontological resources normally considered scientifically significant. The exception to this is Newport Bay, which has produced Pleistocene invertebrate fossils from the San Pedro Formation and Pleistocene vertebrate and invertebrate fossils from the Palos Verdes Sand. Neither of these units is known to underlie the project area at depths expected to be affected by project construction and neither outcrop within 1 mile of the project area. No fossil sites were recorded for Huntington Beach in the UCMP database or PaleoBiology Database and no records were found within the Holocene and Pleistocene sediments underlying the project area (HBEP 2012a).

The applicant augmented the database review with a literature review (HBEP 2012a). One record for Rancholabrean-age vertebrate fossils was found for Huntington Beach, and includes mammoth and bison fossils of Rancholabrean (Late Pleistocene) age. The mammoth specimen was found immediately above a coarse sand unit and was uncovered between 6 and 8 feet below soil level, while the bison jaw was recovered from diatomaceous sandstone 14 to 20 feet below soil level (Miller 1971). No records for fossils within 1 mile of the project site were found, and no further records of fossils within the city of Huntington Beach are known.

Because the entire project area is highly developed, no paleontological resources survey was conducted by the applicant. As noted previously, a reconnaissance-level field review conducted by the applicant confirmed that no native sediment is present at the surface, and that the majority of the project site is covered by concrete or blacktop.

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. There is a low potential for significant fossils to be encountered in the excavations. However, the possibility of encountering fossils remains. Therefore, staff considers monitoring of construction activities in accordance with the proposed conditions of certification is necessary. 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 paleontological resource specialist would be retained for the proposed project by the applicant 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 CEC for a change in the monitoring protocol. Most commonly, this would be a request for lesser monitoring after sufficient monitoring has been performed to finish soil-disturbance work or 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 provides documentation of potential geologic hazards at the proposed HBEP plant site. Staff reviewed information presented in the AFC 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. However, 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 project design.

Staff’s independent research included the review of available geologic maps, reports, and related data of the proposed HBEP plant 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 northwest trending strike-slip faults; however, within this complex zone of shear, areas of compression also occur. Major active and potentially active faults in the region are shown on **Geology and Paleontology - Figure 7**. 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) (**Geology and Paleontology - Figure 8)**.

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 transform strike slip faulting, tectonic compression in the southern California area has 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 Mw6.8 1994 Northridge earthquake. It is likely that in 1769, a M7+ earthquake occurred on the San Joaquin Blind thrust which uplifted coastal Orange County approximately 10 feet (Grant 2004).

Active faults with a potential to affect the HBEP site are listed and described below and their locations presented on **GEOLOGY AND PALEONTOLOGY - FIGURES 7 AND 8)**:

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).

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 M6.3 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 7.5Mw (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 1 mile north of the project site (**Geology and Paleontology - Figure 9)**.

Some of the earliest mapping of the NIFZ was conducted by J. F. Poland (Poland 1956). Understanding that continued development and accelerated withdrawal of groundwater in the southern Los Angeles basin could result in migration of saltwater into the coastal portions of the aquifer, Poland et. al., studied the geologic conditions affecting groundwater in the Long Beach-Newport Beach coastal area (Poland 1956). Poland reviewed water well logs, electronic well logs from oil wells, studied surficial geomorphic and geologic features, and compared water chemistry from samples collected from water wells. In his study, Poland identified the Newport-Inglewood structural zone as a potential barrier to saltwater intrusion into the inland aquifer. In his study, Poland emphasizes that the occurrence of faults in the area is inferred, that the structure is not sufficiently defined to warrant graphical section and that the geologic, hydrologic and geochemical evidence does not prove or disprove that the inferred faults transect deposits of Pleistocene age (Poland 1956). On his large scale map that accompanies the report, Poland identified the approximate queried location of an inferred concealed fault trending from the area near the mouth of the Santa Ana River, northwest onto the Huntington Mesa (Poland 1956).

Adjacent to the northern boundary of the project site, the trace of a concealed fault has been shown on numerous maps and labeled as the South Branch of the NIFZ (Huntington 2008) (**Geology and Paleontology - Figure 10)**. This fault location was depicted on a map (CDMG Bulletin 204) prepared by P.K. Morton (Morton 1981) that reference Poland's work (Poland 1956), but was largely developed to show mines and mineral deposits in Orange county. Faults depicted as the NIFZ on another map (U.S. Geological Survey Open-File Report 99-172) prepared by D.M. Morton (Morton 2004), were compiled from information developed by Jahns (Jahns 1954) and Rogers (Rogers 1965). Rogers' 1965 map referenced both Jahn's 1954 and Poland's 1956 maps. As both of these newer maps (Morton 1981, Morton 2004), are compilations of previous information, they both show the South Branch fault as a concealed fault in identical locations.

As a constraint to his mapping, D.M Morton stated, "*The Santa Ana 30' X 60' geologic-map database should be used to evaluate and understand the geologic character of the Santa Ana 30' X 60' quadrangle as a whole. The data should not be used for purposes of site-specific land-use planning or site-specific geologic evaluations. The database is sufficiently detailed to identify and characterize many actual and potential geologic hazards represented by faults and landslides and posed by ground subsidence and earthquake-generated ground shaking. However, it is not sufficiently detailed for site-specific determinations or evaluations of these features. Faults shown do not take the place of fault-rupture hazard zones designated by the California State Geologist (see Hart, 1988)*" (Morton 2004). However, it appears that this map has been used by several investigators for site- specific land- use planning (Huntington 2008) and site-specific geologic evaluations (Ninyo 2011).

In 1988, the subsurface location of the South Branch Fault was constrained by W. A. Bryant using data collected from local oil wells (Bryant 1988). Using that data, Bryant interpreted a "fault" to be one that offset all lithologic units beneath the depth of a contoured stratigraphic horizon (Bryant 1988, Plate 1). The horizon used in Bryant's work was measured at a depth of 730 meters (2,395 feet) below sea level. Plate 1 of Bryant's study indicates the fault is in the subsurface and no surface trace is visible (Bryant 1988). Further, Bryant's map of recently active traces of the Newport Inglewood fault zone shows the subsurface trace approximately 1,000 feet northeast of the project site and trending northwest beneath the ASCON landfill (**Geology and Paleontology - Figure 11**).

The Southern Newport-Inglewood fault was investigated by CGS in the early phases of fault evaluation under the Alquist-Priolo Special Studies Zone Act of 1972 and under the subsequent Alquist-Priolo Earthquake Fault Zoning Act of 1994 (PBS&J 2009). The Fault Evaluation Report (CGS 1985) and its Supplement (CGS 1986a), were prepared to decide which of the numerous segments of the Southern Newport Inglewood fault were to be designated under the Act and "zoned" for special studies in the event structures for human occupancy were proposed that could be underlain by active traces of these faults. Only the North Branch and Seal Beach faults were considered to meet the criteria of sufficient activity and definition to be zoned under the Act (**Geology and Paleontology - Figure 9)**. Based on field investigations, aerial photo interpretation, reviewing previous geological and fault studies, as well as articles appearing in publications by CGS, USGS, the California Department of Water Resources (DWR), or in peer-reviewed journals, CGS concluded that both faults (Seal Beach and North Branch) probably had been active as recently as very latest Pleistocene time, i.e. between 15,000 and 20,000 years ago, but that there was sufficient evidence only for the North Branch fault to indicate it had undergone Holocene displacement, i.e., during the last 11,000 years. Consequently, although the city recognizes eight faults of different activity levels crossing the Specific Plan Area south of Ellis Avenue, only the trace of the North Branch fault at Adams and Beach was delineated by the State as an Earthquake Fault Zone (PBS&J 2009)(**Geology and Paleontology - Figure 9)**.

CGS has an ongoing program to update earthquake fault zoning decisions. Updates occurred in the vicinity of the city of Huntington Beach in 1990, 1991, 2003, and 2007, but the North Branch fault remained the only zoned source of possible surface faulting in the Specific Plan Area. This does not mean there is no threat of surface rupture along the other fault traces: only that the current state of knowledge about them does not indicate whether a threat is present (PBS&J 2009).

Extensive faulting-related studies on the Newport–Inglewood South Branch Fault by Leighton & Associates for the Bolsa Chica Project suggests that the South Branch Fault is neither active nor potentially active (GMU 2011).

Preliminary geotechnical studies conducted in 2002 at the northerly adjacent proposed Poseidon facility concluded that there is little specific evidence of the existence of the South Branch fault beneath the proposed Poseidon property (GeoLogic 2002). Further, GeoLogic cites the Bryant study and concludes "the closest fault segment of the NIFZ is an inferred trace with no surface expression lying approximately 1,000 feet northeast of the North Tank site" (GeoLogic 2002).

However, geodetic studies conducted by Orange Coast College found that survey stations installed across a potential restraining bend along the South Branch of the Newport-Inglewood fault zone appear to be converging at a high rate (Bender 2001). Assuming that surface motions accurately depict subsurface conditions, this may possibly indicate that strain is accumulating at depth indicating activity of the South Branch Fault (Bender 2001).

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.

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. 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 HBEP 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 "DesignMaps" Web Application (**Geology and Paleontology Table 3**). 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 HBEP's location, were calculated using latitude and longitude inputs of 33.644 degrees north and 117.977 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 HBEP 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.

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**. 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 in a Liquefaction Investigation Zone on the State of California Seismic Hazard Zone Map for the Newport Beach Quadrangles (CGS 1997). 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 1997). The city of Huntington Beach has mapped the project site area having a “High to Very High” Liquefaction Potential (PBS&J 2009).

Geology and Paleontology Table 3
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	1.612 g
S1 – Mapped Spectral Acceleration, Long (1.0 Second) Period	0.598 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	0.967 g
SD1 – Design Spectral Response Acceleration, Long (1.0 Second) Period	0.958 g
SMS – Spectral Response Acceleration, Short (0.2 Second) Period	1.451 g
SM1 – Spectral Response Acceleration, Long (1.0 Second) Period	1.436 g

ASCE = American Society of Civil Engineers
Values from USGS 2010b

Groundwater was measured in geotechnical borings at a depth of approximately 14 feet below ground surface (Ninyo 2011). Ninyo and Moore stated that the measured groundwater depth is likely not representative of stabilized conditions. In the Seismic Hazard Zone Report for the Anaheim and Newport Beach 7.5 minute quadrangles, the California Division of Mines and Geology reported groundwater at the site to occur at a depth of 3 feet below ground surface (CDMG 1997). The CDMG study was based on older topographic maps and they did not take into account the elevation of filled areas. Based on the grading plan provided in the AFC (HBEP 2012a), the existing site surface is approximately 8 feet above the natural ground surface. This configuration would suggest that the water level measured in the geotechnical borings would be at a depth approximately 6 feet below the natural ground surface. Both of these determinations indicate that groundwater is shallow at the site and surrounding vicinity. 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 preliminary geotechnical report (Ninyo 2011), subsurface conditions at the site are likely to be conducive to liquefaction. Groundwater levels should be confirmed and the liquefaction potential on the proposed HBEP site should be addressed in a project-specific geotechnical report, per CBC 2013 requirements and proposed Condition of Certification **GEO-1**, and Conditions of Certification **Facility Design GEN-1**, **GEN-5** and **CIVIL-1**.

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, channel).

An empirical model is typically used to predict the amount of horizontal ground displacement within a site (Ninyo 2011). 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. Other factors such as earthquake magnitude, distance from the earthquake epicenter, thickness of the liquefiable layers, and the fines content and particle sizes of the liquefiable layers also affect the amount of lateral ground displacement.

The project site includes free-face slopes along the Huntington Beach Channel on the north and east sides of the site. However, based on analysis of the sampler blow counts and generally discontinuous nature of the underlying soil layers encountered during the preliminary geotechnical evaluation, the project site is not considered susceptible to significant seismically induced lateral spread (Ninyo 2011). However, the susceptibility of the underlying beds to lateral spread beneath the proposed HBEP 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**.

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 2011). Their analysis indicated that seismically induced settlement at the project site would be approximately 1¼ inch 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**, **GEN-1**, **GEN-5** and **CIVIL-1**. 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.

Hydro Compaction

Hydro compaction (also known as hydro-collapse) is generally limited to young soils that were deposited rapidly in a saturated state, most commonly by a flash flood. The soils dry quickly, leaving an unconsolidated, low density deposit with a high percentage of voids. Foundations built on these types of compressible materials can settle excessively, particularly when landscaping irrigation dissolves the weak cementation that is preventing the immediate collapse of the soil structure. As stated in the preliminary geotechnical report, "Due to the high groundwater levels encountered at the site and the reported historically high groundwater, it is our opinion that the site soils are not susceptible to hydro-collapse" (Ninyo 20011). The potential for and mitigation of the effects of hydro compaction of site soils should be addressed in a project-specific geotechnical report, per CBC 2013 requirements and proposed Conditions of Certification **GEO-1**, **GEN-1**, **GEN-5** and **CIVIL-1**. Typical mitigation measures would include over-excavation/replacement, mat foundations or deep foundations, depending on severity and foundation loads.

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.

Based on the results of the preliminary geotechnical evaluation, the project site was determined to be underlain by fill soils and young native alluvial sediments. The fill soils were considered potentially compressible (Ninyo 2011). In addition, native soils encountered in the borings contained interbeds of very soft silty clay alluvial/estuarine soil layers which were considered potentially compressible (Ninyo 2011). Due to the presence of potentially compressible soils at the site, the potential impacts of settlement could be significant without appropriate mitigation during detailed project design and construction.

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**, **GEN-1**, **GEN-5** and **CIVIL-1**. 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**, **GEN-1**, **GEN-5** and **CIVIL-1**. 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 (Ninyo 2011).

As part of the preliminary geotechnical evaluation, the corrosion potential of on-site soil was evaluated for its effect on steel and concrete structural members (Ninyo 2011). Laboratory testing was performed on a representative soil sample to evaluate pH, minimum electrical resistivity, and chloride and soluble sulfate content. Based on the laboratory test results, Ninyo & Moore classified site soils as corrosive (Ninyo 2011).

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.

The potential for and mitigation of the effects of corrosive 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**, **GEN-1**, **GEN-5** and **CIVIL-1**. 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.

Methane Gas

As presented in the applicant's preliminary environmental assessment (HBEP 2012a), one plugged oil and gas well is located on the southwest portion of the site between HBGS Units 1 and 2 and the retention ponds. Several wells were identified off site, including two plugged oil and gas wells located just east of the north and east fuel oil storage tanks to the north of the project. An abandoned dry hole is also present off site just north of the north fuel oil storage tank. The presence of an oil well on the site and several additional wells in the site vicinity represent a *Recognized Environmental Condition* in connection with the site (HBEP 2012a). Huntington Beach Municipal Code Section 17.04.085, Methane District Regulations, requires inspection and, if necessary, mitigation of abandoned oil wells and oil contaminated soil for projects within the city of Huntington Beach (Huntington 2010b).

As indicated in the Environmental Hazards Element of the City of Huntington Beach General Plan, the site is located within an area designated as a Methane Overlay District (Huntington 2010b). Projects proposed for construction in a Methane Overlay District must abide by Methane District Building Permit Requirements as described in City Specification No 429, incorporated within Huntington Beach Municipal Code Section 17.04.085. The City of Huntington Beach strongly recommends that no structures be constructed over or near abandoned oil wells or hydrocarbon contaminated soil. If abandoned wells can be proven safe and/or hydrocarbon contaminated soils conform to Huntington Beach Soil Cleanup Standard 431-92, in accordance with City Specification No 429, construction may be allowed. Further analysis of potentially contaminated soils not related to abandoned oil and gas exploration and development is addressed in the **WASTE MANAGEMENT** section of this document.

City Specification No 429 has the following four requirements to ensure there are no impacts:

1) Testing and Mitigation measures for Oil Impacted Development

2) Hydrocarbon Impacted Soil Mitigation

3) Area Well Documentation and Review

4) Safety Measures for Control of Methane.

Staff understands the owner is aware of the existing abandoned well on the property and one or more of the requirements outlined above may not apply given past activity at the site. However staff is not aware of what previous mitigation actions have been taken or whether all wells at the site have been identified. Given the new grading and construction that is planned, it is possible additional wells or areas impacted by oil and gas exploration could be identified. Staff recommends the owner be required to comply with City Specification No. 429 as recommended in Condition of Certification **GEO-2** to ensure potential impacts are mitigated. Staff also recommends that any mitigation required in accordance with Condition of Certification **GEO-2** also be coordinated with Condition of Certification **WASTE MANAMGENT-1.**

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.

The site is relatively flat and located substantial distances from steep terrain. Therefore, the site is not subject to landslide hazards.

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 California is at risk from both local and distant tsunamis (SSC 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 (SSC 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 (SSC 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 HBEP 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 extending eastward from the entrance of Los Angeles harbor (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 12**).

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. However, tsunami flooding could also come from behind the beach through the drainage channel outfall and potentially overtop the flood control levees. 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 (Rick Wilson, CGS California Tsunami Preparedness and Hazard Mitigation Program, personal communication, 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 (SSC 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. The only nearby enclosed bodies of water that could potentially develop a seiche is the Huntington Beach Channel and the Magnolia Marsh Ecological Preserve. Given the improbable development of a seiche wave in either of these bodies of water, the magnitude of a seiche impacting the project site is anticipated to be lower than that of a tsunami. 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**, **GEN-1**, **GEN-5** and **CIVIL-1**. 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, hydro compaction, 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 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.

Paleontological resources have been documented in the general area of the proposed project but not in sediments which could be encountered beneath the site. If significant paleontological resources are uncovered during construction, they would be protected and preserved in accordance with Conditions of Certification **PAL-1** to **PAL-7**. These conditions would also mitigate any potential cumulative impacts.

The proposed HBEP 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**, **GEN-1**, **GEN-5** and **CIVIL-1.**

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.

RESPONSE TO AGENCY AND PUBLIC COMMENTS

The California Coastal Commission (Luster 2013) provided preliminary comments regarding geologic hazards as they may affect the site. The Coastal Commission's comments with the Energy Commission responses are provided below:

Comment

The "*site is subject to several severe geologic hazards"*.

Response

True, however, the site is not subject to any geologic hazards that are any more significant than those shared by all adjacent properties/developments. Staff has also recommended the applicant be required to comply with CBC 2013 which would ensure the facility is designed and constructed in accordance with the industry standards to resist effects of geologic hazards.

Comment

Site's location is adjacent to an earthquake fault.

Response

As stated in the analysis above, an inferred concealed fault is located approximately 1,000 feet east of the project site. There is no indication that the concealed fault is active. The closest active fault is located approximately 1 ½ miles to the north of the site.

Comment

The site's susceptibility to relatively high expected ground motion (at or above 1 g).

Response

The site is susceptible to strong seismic shaking. The susceptibility to the proposed project is not any more than to which all developments in the area are exposed. The expected ground motion will be addressed in the structural design of the facility.

Comment

The site is susceptible to surface fault rupture.

Response

There are no known active faults beneath the site and the site is not considered susceptible to surface fault rupture.

Comment

The site is subject to liquefaction and lateral spreading.

Response

True. Staff has recommended the applicant be required to comply with CBC 2013 which would ensure the facility is designed and constructed in accordance with the industry standards to resist effects of these phenomena.

Comment

The site has been identified as being subject to moderate to very heavy damage from earthquakes.

Response

Staff believes the site could be subject to significant ground shaking from earthquakes. However, staff also concludes that potential "very heavy damage from earthquakes" can be mitigated with appropriate design and construction methods through compliance with CBC 2013.

Comment

The site is also within a tsunami run-up zone with expected run-up levels of about 16 feet.

Response

This statement is unsupported by currently available studies. The expected tsunami run-up is estimated between 5 and 9 feet above sea level and is mapped by the California Geological Survey as approaching 7 feet above sea level. If the modeled tsunami occurred at an abnormally high tide, run-up could approach an elevation of 11 feet above sea level.

Comment

The 16 feet of tsunami inundation is well above the foundation of the power plant.

Response

Based on the site grading plan, the ground surface in the eastern portion of the proposed plant will be more than 12 feet above sea level and the western portion more than 16 feet above sea level. Well "above" the expected run-up elevation of 7 feet above sea level.

Comment

Predicted sea level rise during the expected operating life will be 2 feet by 2050.

Response

Based on the sea level rise projections developed by the Sea-Level Rise Task Force of the Coastal and Ocean Working Group of the California Climate Action Team, sea level is predicted to rise a maximum of 17 inches above 2000 level by the year 2050 (OPC 2010).

CONCLUSIONS

The applicant 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.

PROPOSED CONDITIONS OF CERTIFICATION

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** and **GEO-2** of this section. Proposed paleontological Conditions of Certification follow in **PAL-1** through **PAL-8**. 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.

GEO-2 The project owner shall comply with the requirements of City Specification No. 429 of Huntington Beach Municipal Code Section 17.04.085 (Huntington 2010b) to ensure the existing and previously identified abandoned gas well on the site, and any additional wells that may be identified during grading and construction, are appropriately mitigated and made safe. The project owner shall consult with the Fire Chief to determine whether any of the following requirements of City Specification No. 429 would apply, and shall submit the recommendations of the Fire Chief to the CPM for review and approval.

As required, the permit shall specifically include:

1) a site soil testing plan capable of detecting the presence of methane in the near surface soils,

2) field testing as specified in the approved plan,

3) laboratory test data,

4) pre-site disturbance mitigation if high concentrations of methane are discovered during testing,

5) site audits, and

6) area well documentation and review.

In accordance with City Specification No, 429, the permit shall also include designs for recommended methane control systems necessary to mitigate these potential hazards, if present.

Verification: The project owner shall include in the application for a Methane District Building Permit a copy of the construction project Site Plan Review approved by the California Department of Conservation Division of Oil, Gas and Geothermal Resources (DOGGR) that is on file with the Huntington Beach Fire Department PetroChem section. A copy of the site plan review, application for the Methane District Building Permit and any comments by Huntington Beach Fire Chief are to be provided to the CPM at least 30 days prior to initiation of 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 Qualified Professional Paleontologist as defined 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.

<u>Verification:</u>

(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 monitors 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.

<u>Verification:</u>

(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.

<u>Verification:</u>

(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.

<u>Verification:</u>

(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. 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 Paleontological Resources Report (PRR) by the designated PRS. The PRR shall be prepared following completion of ground-disturbing activities. The PRR shall include an analysis of the collected fossil materials and related information, and shall be submitted to the CPM for approval.

The report shall include, but not be limited to, a description and inventory of recovered fossil materials; a map showing the location of paleontological resources encountered; and the PRS' description of sensitivity and significance of those resources.

<u>Verification:</u> 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.

<u>Verification:</u> 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
HUNTINGTON BEACH ENERGY PROJECT (12-AFC-02)

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: ___/___/__

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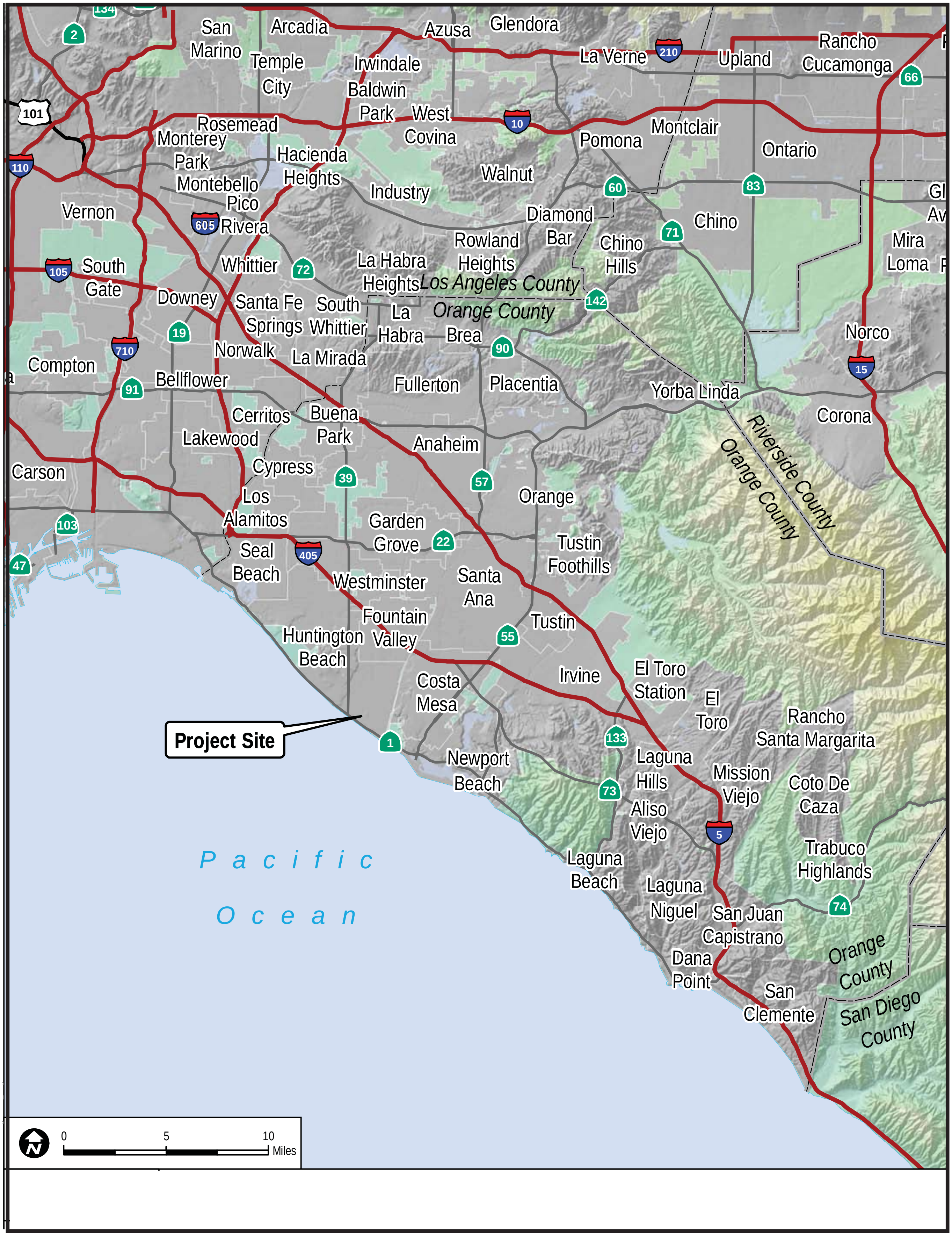
GEOLOGY AND PALEONTOLOGY - FIGURE 1

Huntington Beach Energy Project - Location Map

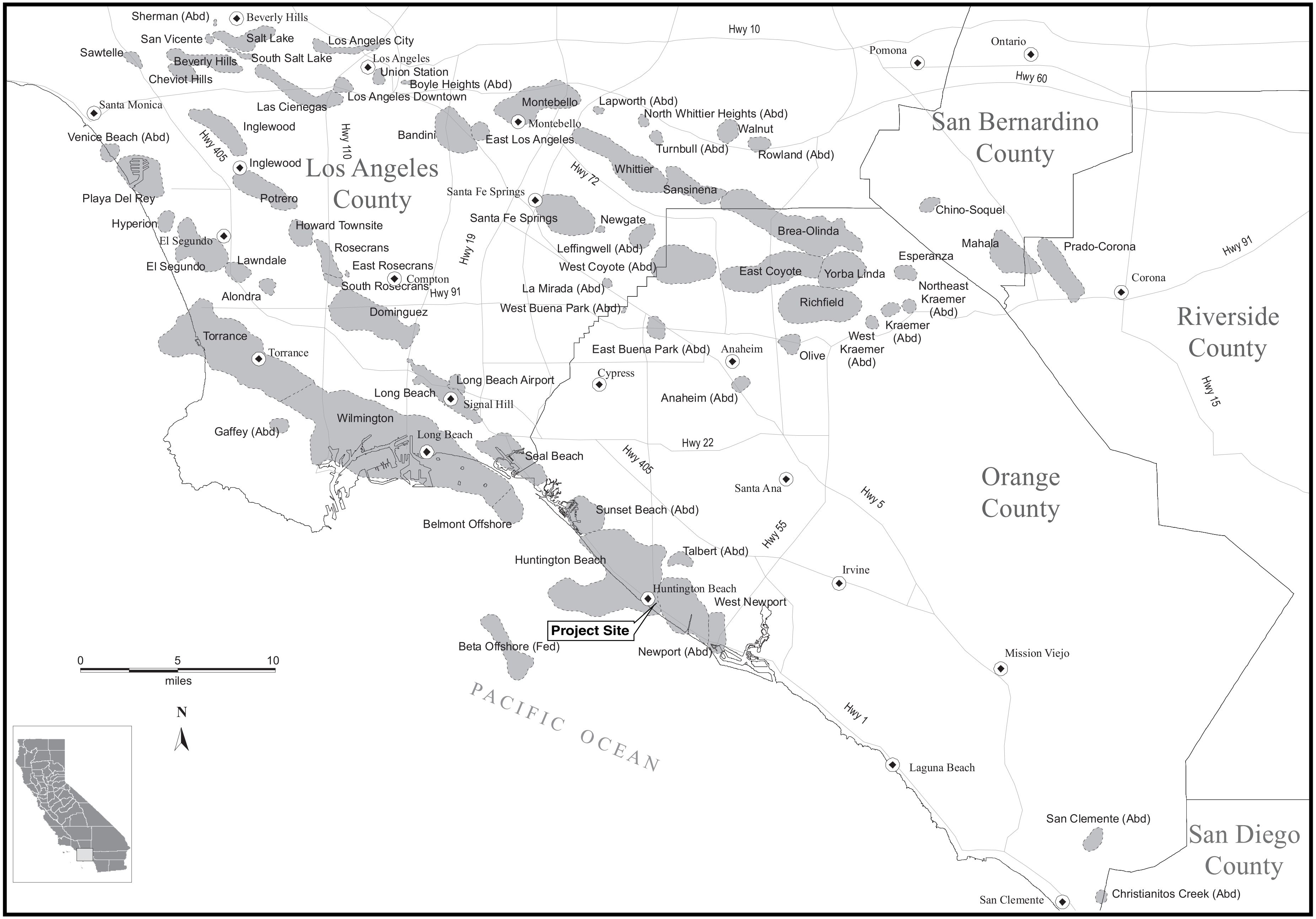


CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCE: Seawater Desalination Project at Huntington Beach, Draft Subsequent Environmental Impact Report, May 2010

GEOLOGY AND PALEONTOLOGY - FIGURE 2

Huntington Beach Energy Project - Los Angeles Basin area oil fields

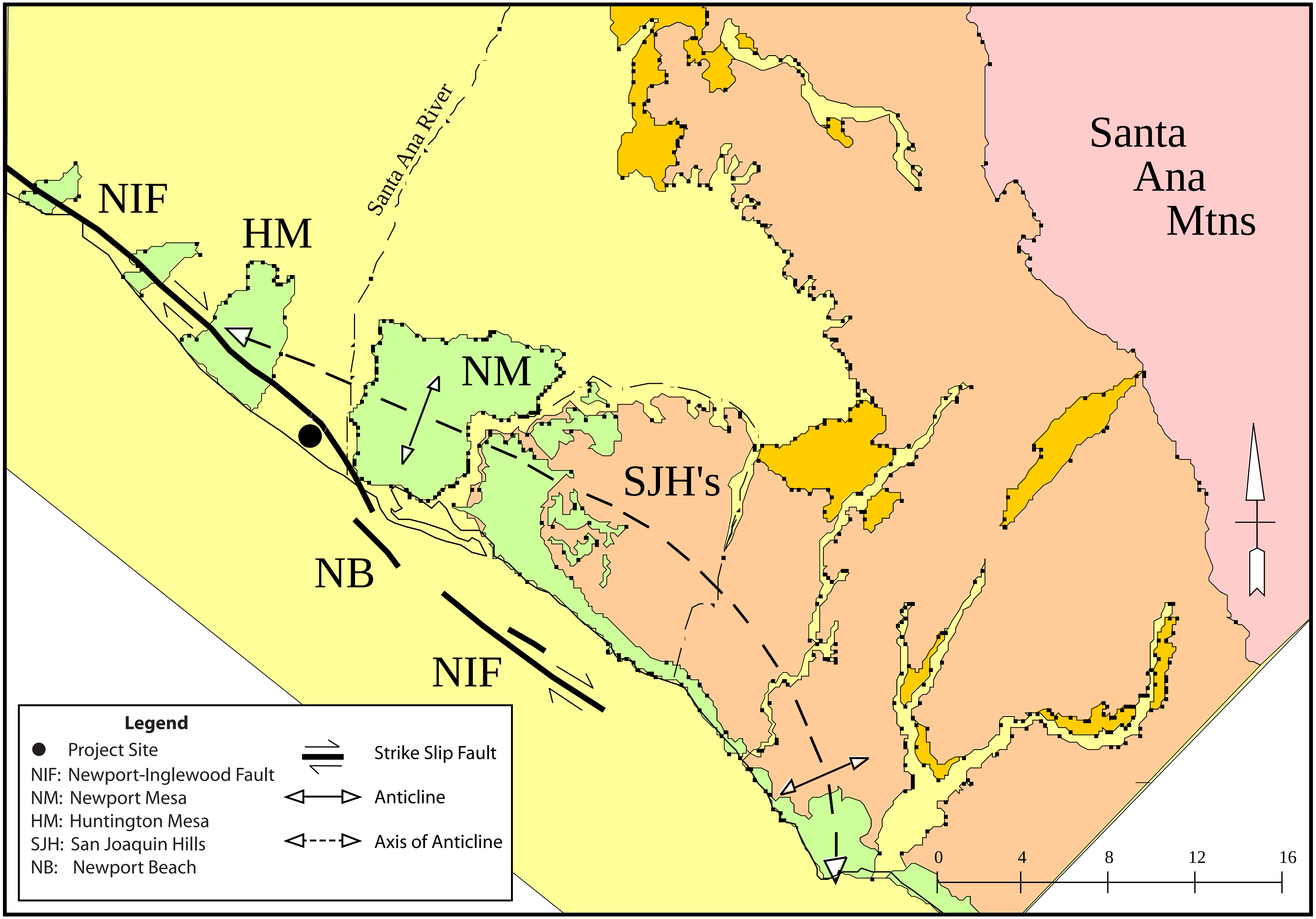


CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCE: Urban Development of Oil Fields in the Los Angeles Basin Area, 1983 to 2001 (Gamache 2003)

GEOLOGY AND PALEONTOLOGY - FIGURE 3

Huntington Beach Energy Project - San Joaquin Hills Anticline



CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCE: (Muller 1998)

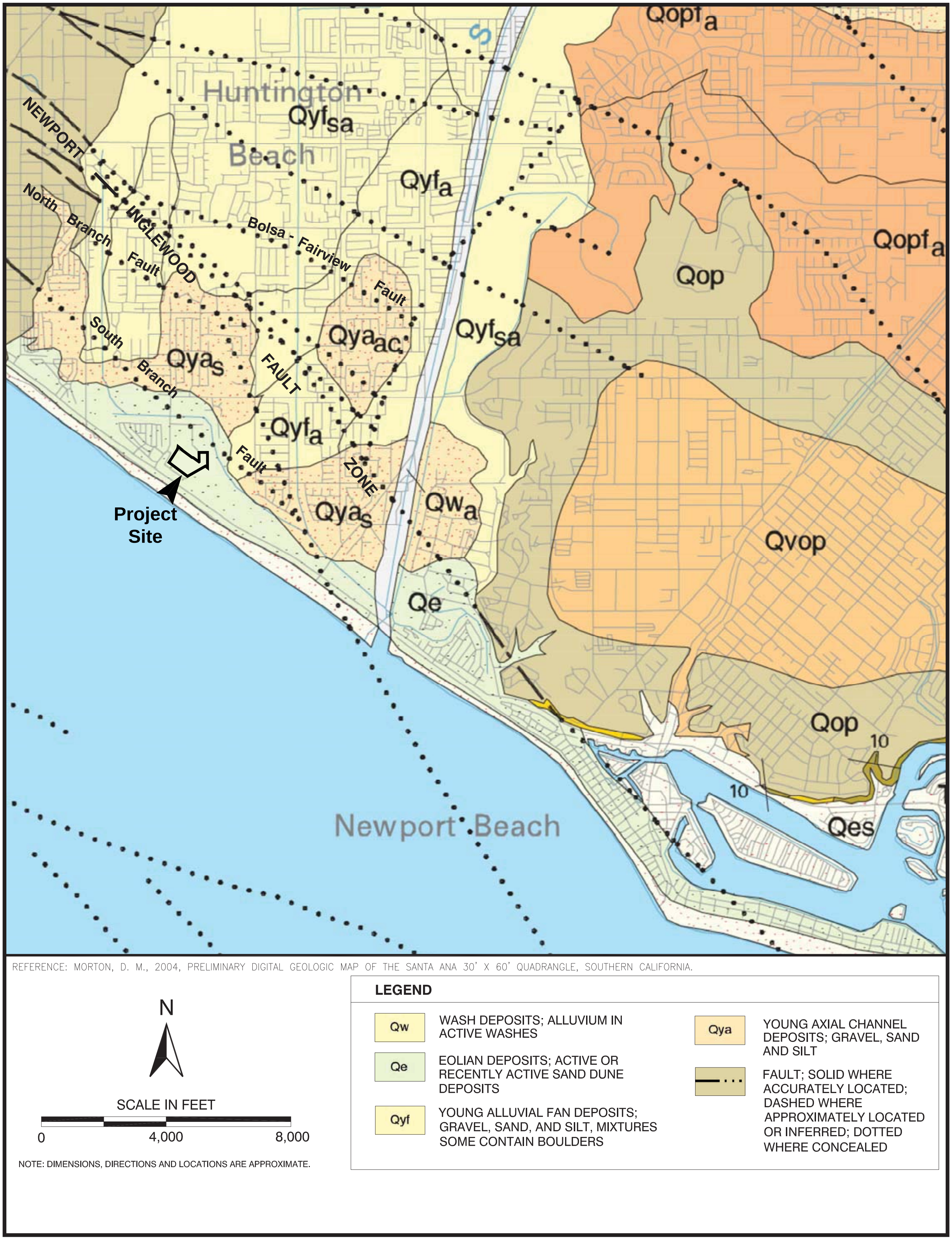
GEOLOGY AND PALEONTOLOGY

GEOLOGY AND PALEONTOLOGY - FIGURE 4
Huntington Beach Energy Project - Site Map

CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION
SOURCE: AFC Section 5.7, Figure 5.7-1

GEOLOGY AND PALEONTOLOGY - FIGURE 5

Huntington Beach Energy Project - Regional Geology

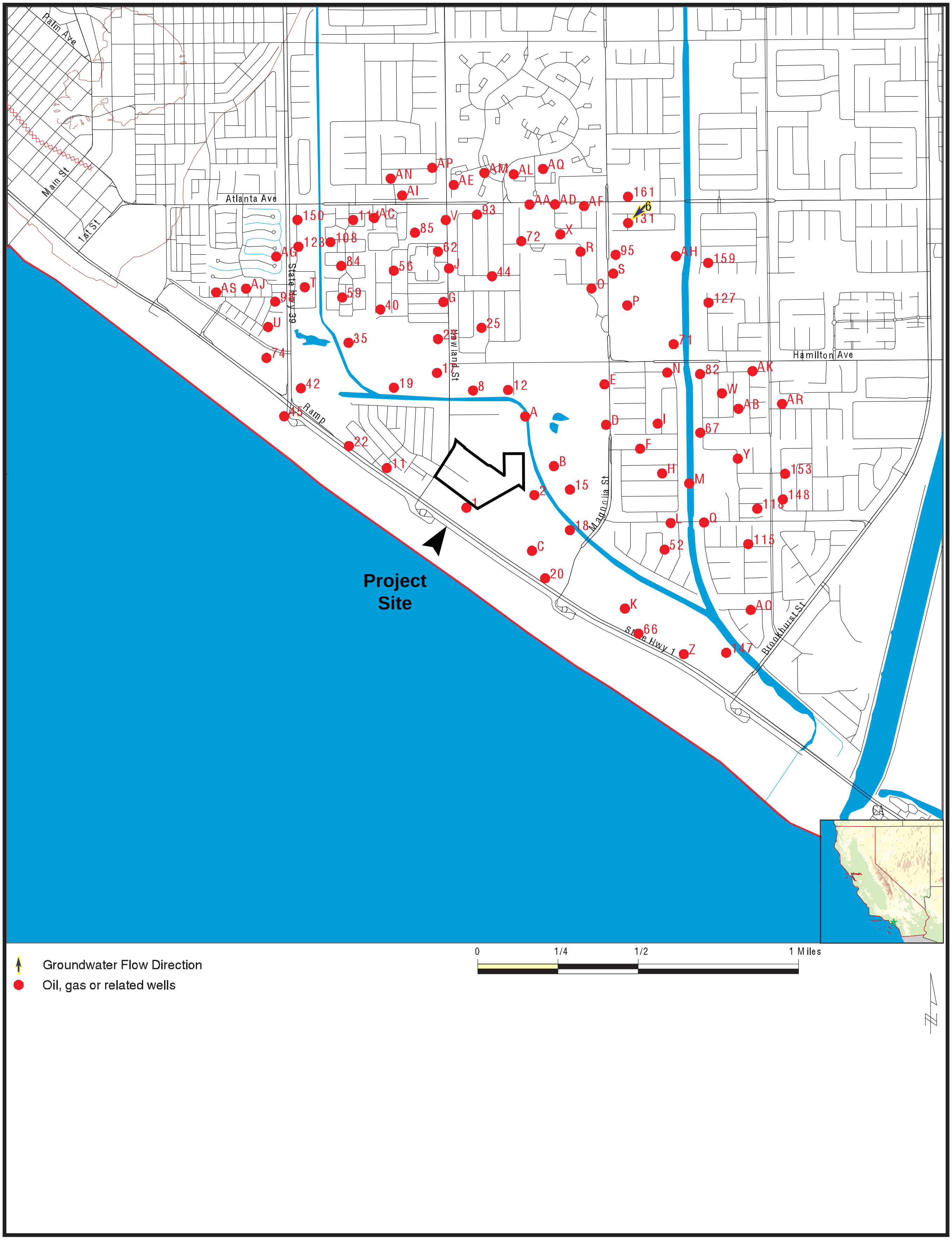


CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCE: Morton, D. M. 2004, Preliminary Geologic Map of the Santa Ana 30' x 60' Quadrangle, Souther California

GEOLOGY AND PALEONTOLOGY - FIGURE 6

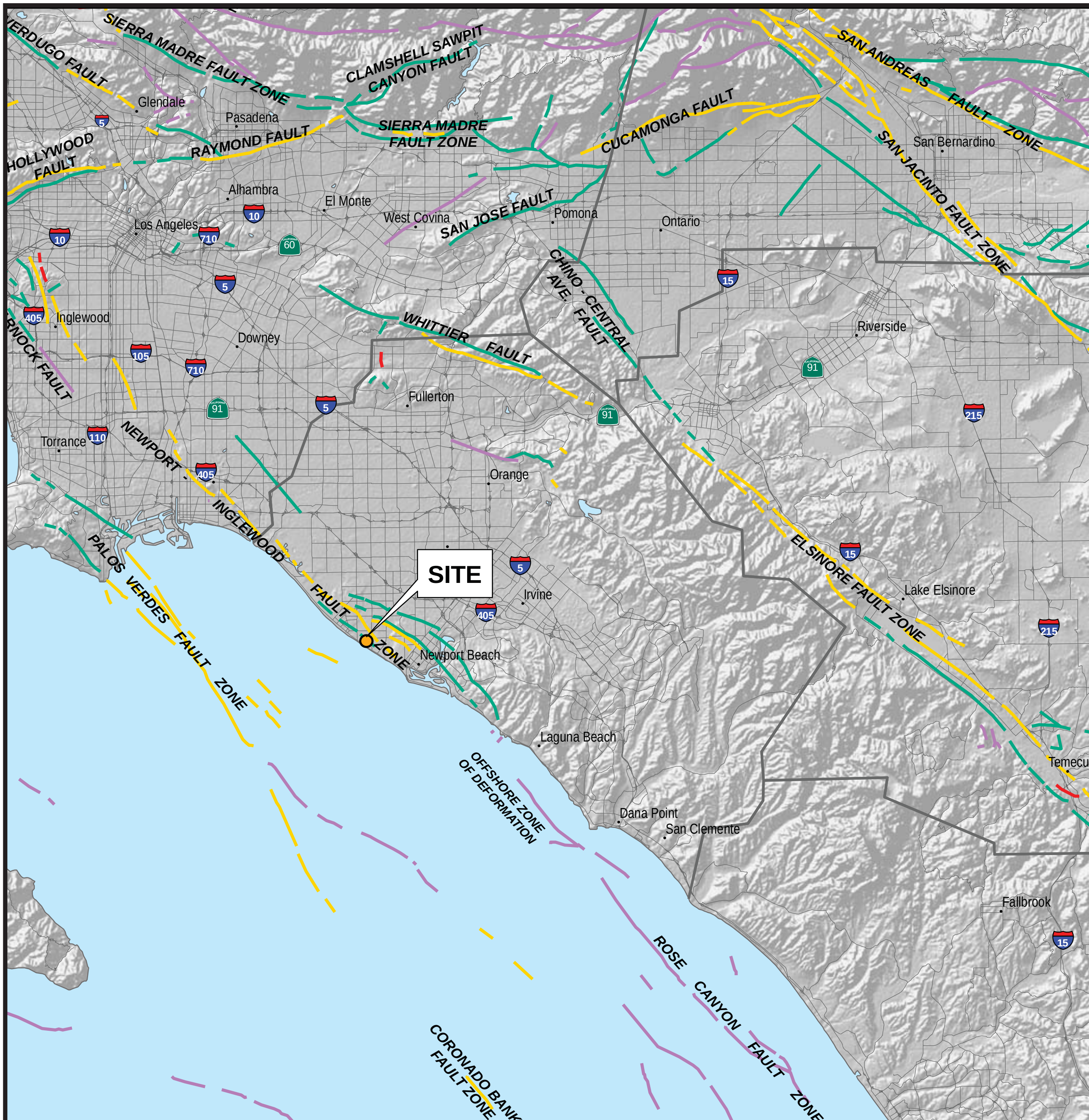
Huntington Beach Energy Project - Abandoned Oil Wells



CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCE:AFC Appendix 5.14A Phase 1 Enviro-Site Assessment

Huntington Beach Energy Project - Fault Locations



GIS DATA SOURCE: CALIFORNIA GEOLOGICAL SURVEY (CGS); ENVIRONMENTAL SYSTEMS RESEARCH INSTITUTE (ESRI)
REFERENCE: JENNINGS, 1994, FAULT ACTIVITY MAP OF CALIFORNIA AND ADJACENT AREAS

LEGEND

FAULT ACTIVITY:

- HISTORICALLY ACTIVE
- HOLOCENE ACTIVE
- COUNTY BOUNDARIES
- LATE QUATERNARY (POTENTIALLY ACTIVE)
- QUATERNARY (POTENTIALLY ACTIVE)

N

10 0 10

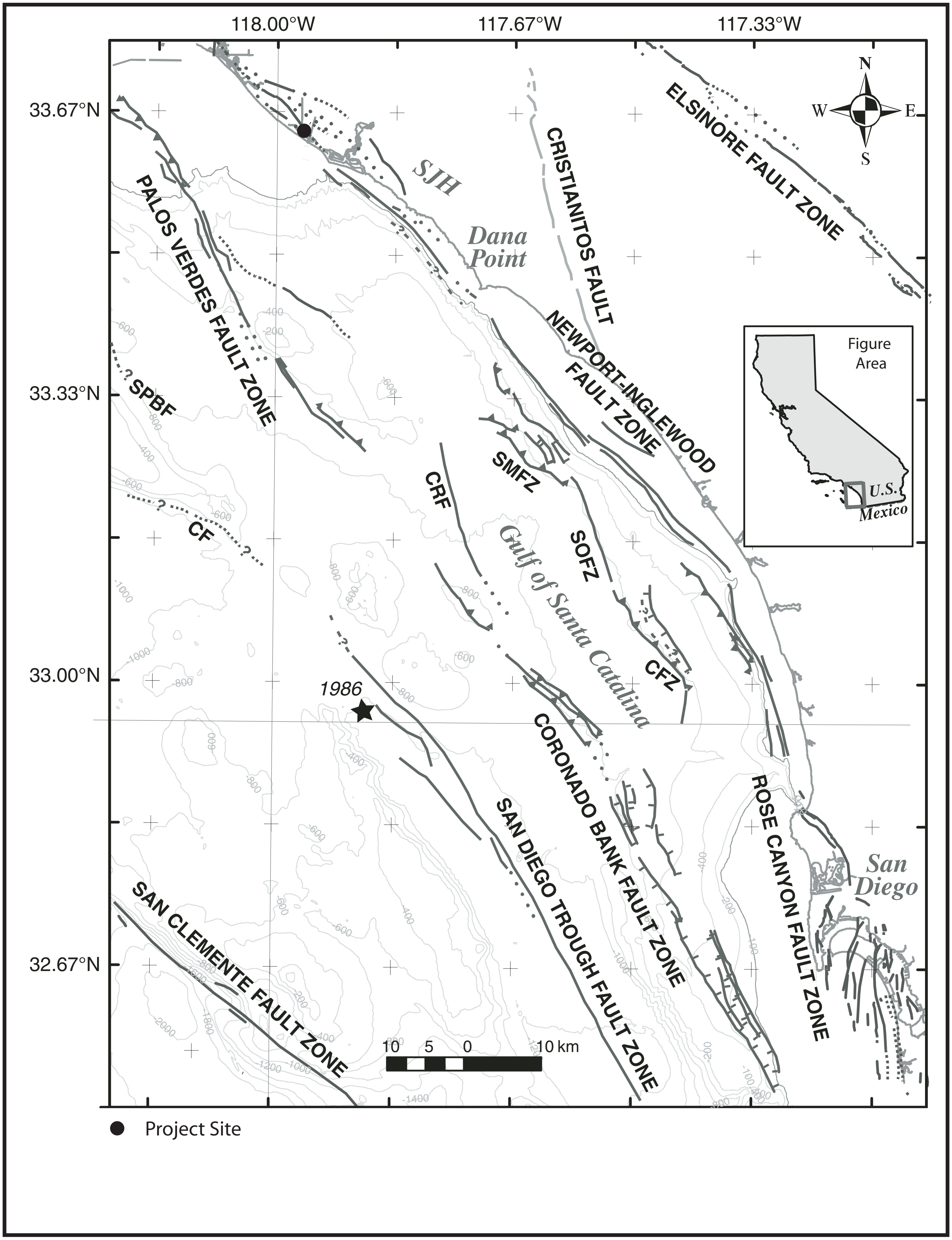
Miles

NOTE: ALL DIMENSIONS, DIRECTIONS, AND LOCATIONS ARE APPROXIMATE

SOURCE:Ninyo & Moore

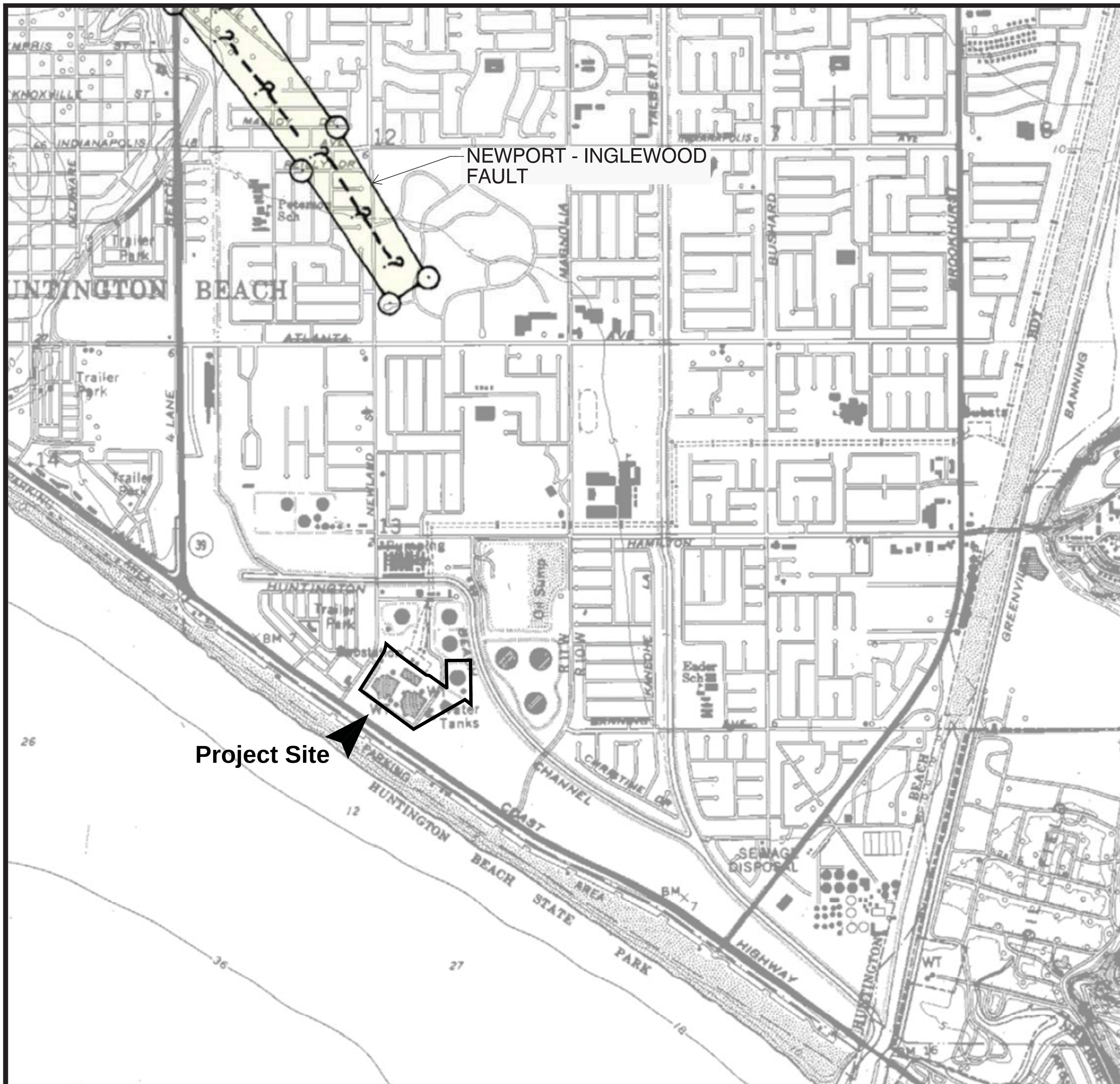
GEOLOGY AND PALEONTOLOGY - FIGURE 8

Huntington Beach Energy Project - Inner Continental Borderland Faults



SOURCE: Recent Faulting in the Gulf of Santa Catalina: San Diego to Dana Point (Ryan 2009)

Huntington Beach Energy Project - Newport-Inglewood Fault



REFERENCE: STATE OF CALIFORNIA SPECIAL STUDIES ZONES,
NEWPORT BEACH QUADRANGLE, JULY 1, 1986.

AES Huntington Beach Energy Project

N

SCALE IN FEET

0 2,000 4,000

NOTE: DIMENSIONS, DIRECTIONS AND LOCATIONS ARE APPROXIMATE.

LEGEND

Potentially Active Faults

1906 C

Faults considered to have been active during Holocene time and to have a relatively high potential for surface rupture, solid line where accurately located, long dash where approximately located, short dash where inferred, dotted where concealed; query (?) indicates additional uncertainty. Evidence of historic offset indicated by year of earthquake-associated event or C for displacement caused by creep or possible creep.

Special Studies Zone Boundaries

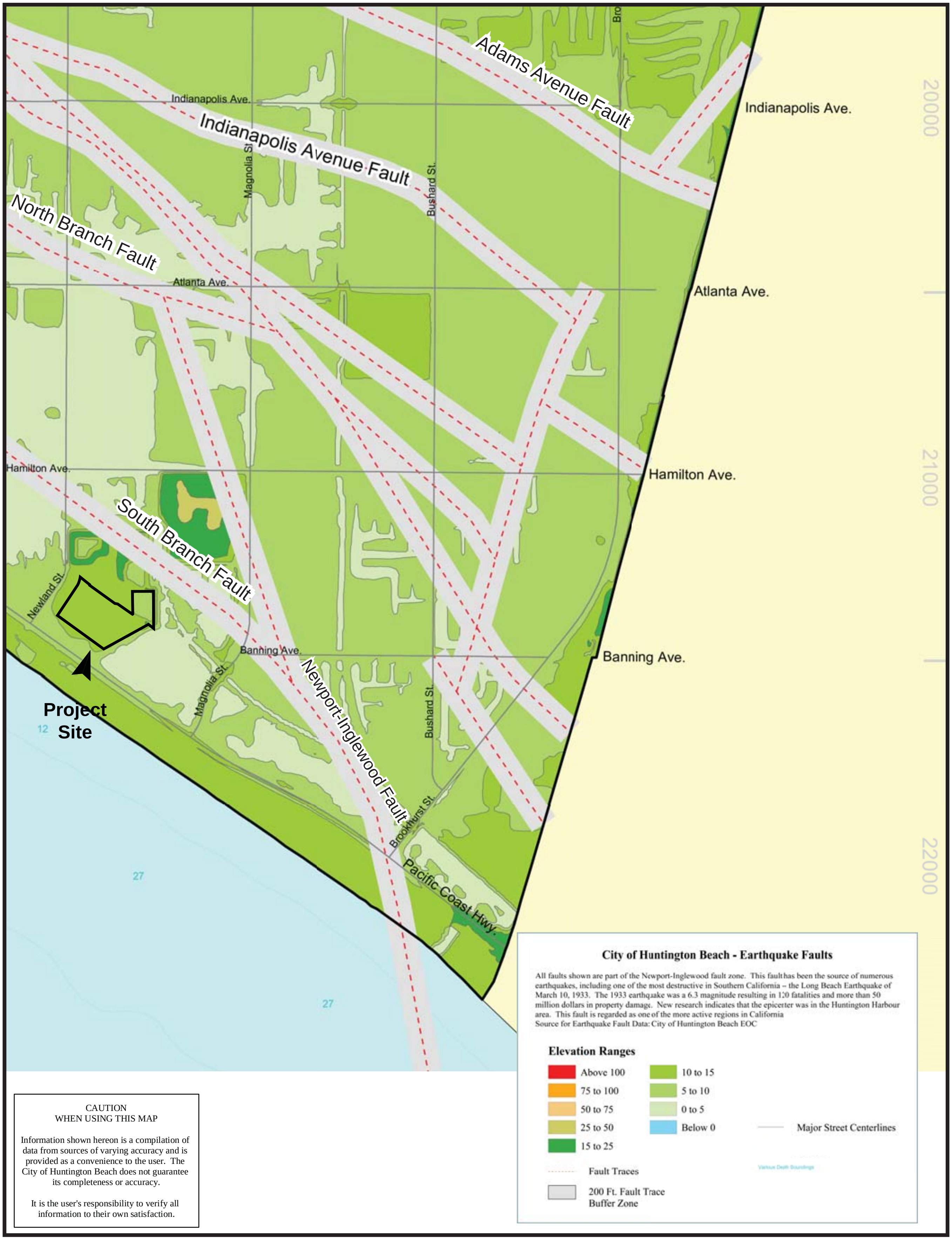
These are delineated as straight-line segments that connect encircled turning points so as to define special studies zone segments.

Seaward projection of zone boundary.

208356_A7.DWG.....GK

GEOLOGY AND PALEONTOLOGY - FIGURE 10

Huntington Beach Energy Project - Fault Map

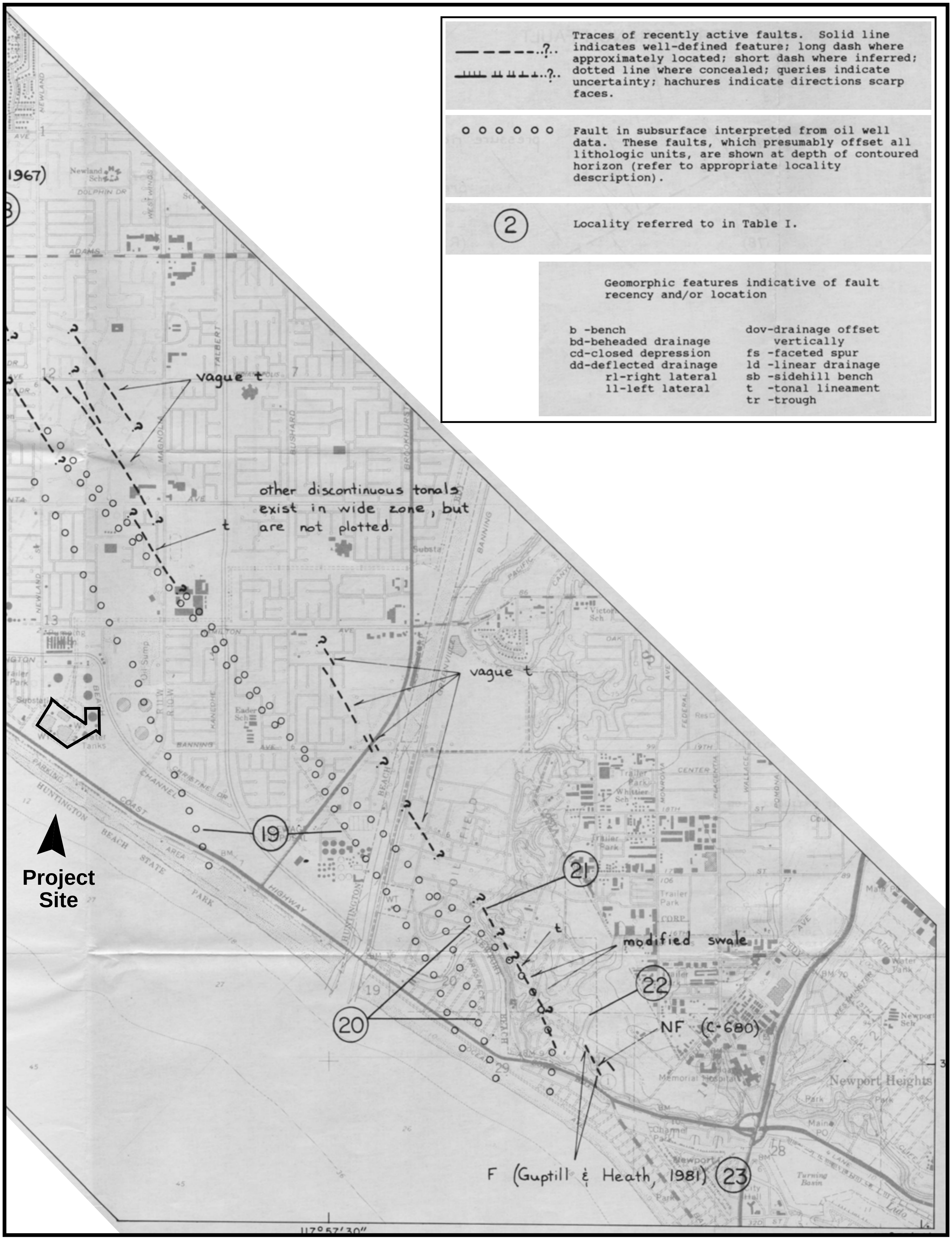


CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCE: City of Huntington Beach EOC

GEOLOGY AND PALEONTOLOGY - FIGURE 11

Huntington Beach Energy Project - South Branch Fault

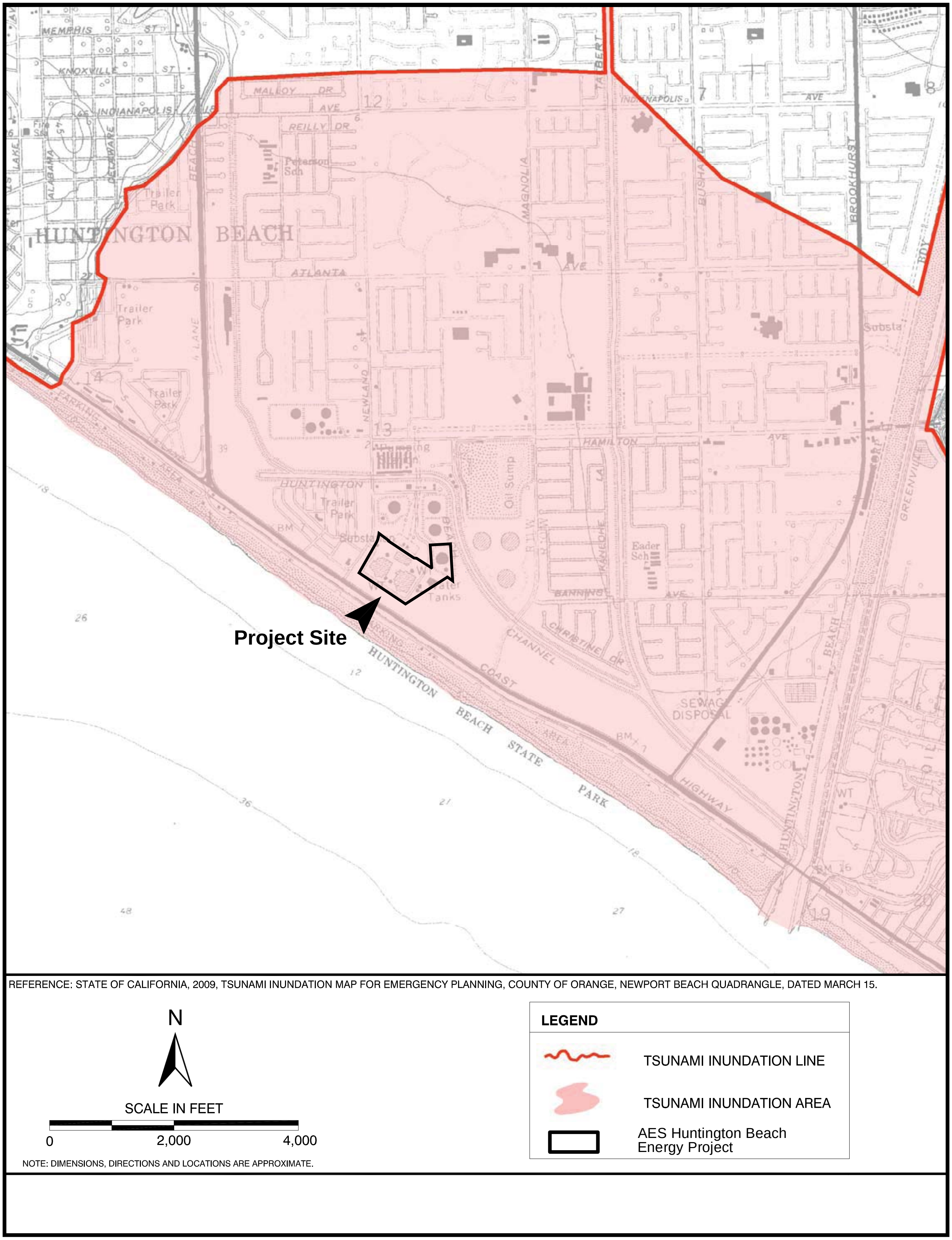


CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCE: Recently Active Traces of the Newport-Inglewood Fault Zone, Los Angeles and Orange Counties, California, Bryant 1988

GEOLOGY AND PALEONTOLOGY - FIGURE 12

Huntington Beach Energy Project - Tsunami Inundation



CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCE: State of California, 2009 Tsunami Inudation Map for Emergency Planning, County of Orange, Newport Beach Quadrangle, Dated March 15

POWER PLANT EFFICIENCY

Testimony of Edward Brady and Shahab Khoshmashrab

SUMMARY OF CONCLUSIONS

The Huntington Beach Energy Project (HBEP) would generate 939 megawatts (MW) (nominal gross output[1]) of electricity at an overall project fuel efficiency of 46 percent lower heating value (LHV[2]). While it 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.

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 HBEP power plant, would result in significant adverse impacts on the environment, as defined in the California Environmental Quality Act (CEQA). If the Energy Commission finds that HBEP'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 support the Energy Commission's findings, this analysis:

- Examines whether the facility will likely present any adverse impacts upon energy resources;
- Examines whether these adverse impacts are significant; and if so,
- Examines whether feasible mitigation measures or alternatives 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.

[1] The output is based on operation under historical ambient weather conditions as recorded at Santa Ana, California (John Wayne-Orange County Airport) (HBEP 2012a, AFC § 2.1).

[2] LHV is Low Heating Value, or a measurement of the energy content of a fuel correcting for post-combustion water vapor.

SETTING

The applicant proposes to build and operate HBEP, a 939 MW (nominal gross output) combined cycle power plant, employing the Mitsubishi Heavy Industries (MHI) 501DA (M501DA) gas turbine generators (also referred to as combustion turbine generators, or CTGs) in a combined cycle configuration, to serve California's energy needs and provide operating flexibility (that is, the ability to start up, shut down, turn down, and provide load following and cycling service, when needed) (HBEP 2012a, AFC §§ 2.1, 2.7). The project's combined cycle equipment would consist of two generator trains. Each train would consist of three M501DA CTGs with evaporative inlet air cooling, three single-pressure heat recovery steam generators (HRSGs) with natural-gas-fired duct burning, and one single-pressure condensing steam turbine generator (STG) arranged in a three-on-one combined cycle train (that is, three CTGs and three HRSGs coupled with one STG) (HBEP 2012a, AFC §§ 1.1, 2.1, 2.1.5). The gas turbines and HRSGs would be equipped with dry low-NOx (oxides of nitrogen) combustors and selective catalytic reduction, respectively, to control air emissions (HBEP 2012a, AFC §§ 2.1.3, 2.1.4, 2.1.5.1, 2.1.5.2).

Natural gas at 145 psig[3] pressure would be delivered to HBEP via an existing Southern California Gas (SoCalGas) 16-inch-diameter pipeline. SoCalGas with furnish a new metering station as part of this project (HBEP 2012a, AFC §§ 2.1.1.1.1, 4.0, Figure 4.01).

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" (Title 14 CCR §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 (Title 14, CCR §15000 et seq., Appendix F).

[3] psig (pounds per square inch gage pressure). Pressure referenced to standard atmospheric conditions at 0 psig. In contrast to psia (pounds per square inch absolute with perfect vacuum as point of reference and 14.7 psia at atmospheric conditions.

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), by definition, consumes large amounts of energy. Under normal conditions, HBEP would burn natural gas at a nominal rate of approximately 7,427 million British thermal units (MMBtu) per hour, LHV, during base load operation (HBEP 2012a, AFC § 2.1.3). This is a substantial rate of energy consumption that could potentially impact energy supplies under some conditions. Under expected project conditions, electricity would be generated at a full load efficiency of approximately 46 percent LHV (HBEP 2012a, AFC § 2.1.3, Figures 2.1-3a – 2.1-3c). This efficiency level compares favorably with the average fuel efficiency of a typical base load/load following combined cycle plant.

ADVERSE EFFECTS ON ENERGY SUPPLIES AND RESOURCES

Fossil Fuel Resources

The applicant has described its source of natural gas to operate the project (HBEP 2012a, AFC §§ 1.1, 2.1, 2.4.5.1, 2.4.7.1). Natural gas at 145 psig pressure would be delivered to the HBEP site via an existing Southern California Gas Company (SoCalGas) 16-inch-diameter pipeline. SoCalGas would furnish a new metering station as part of this project (HBEP 2012a, AFC §§ 2.1.1.1.1, 4.0, Figure 4.01).

SoCalGas has confirmed its system’s adequate capacity to supply the project; a will-serve letter is included in AFC Appendix 4A. 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 Resources

The applicant would employ the existing water service to the site (HBEP 2012a, AFC §§ 2.1.9, 5.15, Table 2.1-1, Figure 2.1-5a, 2.1-5b) via an 8-inch water line provided by the City of Huntington Beach. This water supply would provide process and potable water to the project site. The average and maximum daily water consumption is 94 gallons per minute (gpm) and 190 gpm respectively. Adjusted for 6,665 full-load hours of operation, the annual water demand would be 115 acre-feet per year.

A will-serve letter from the City of Huntington Beach is provided in AFC Appendix 5.15A. 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.

ADDITIONAL ENERGY SUPPLY REQUIREMENTS

The AFC states that SoCalGas has confirmed its system's adequate capacity to supply the project (HBEP 2012a, AFC Appendix 4a). This natural gas supply is a reliable source of fossil fuel for this project. Because HBEP is replacing electric power generation facilities of equivalent output capacity but of lower efficiencies, the project would not increase the existing natural gas demand.

Natural gas fuel would be supplied to the project by SoCalGas via the existing pipeline point of connection. There appears to be no likelihood that HBEP would require additional capacity since regional supplies are currently plentiful.

COMPLIANCE WITH ENERGY STANDARDS

No standards apply to the efficiency of HBEP or other non-cogeneration projects.

ALTERNATIVES TO REDUCE WASTEFUL, INEFFICIENT, AND UNNECESSARY ENERGY CONSUMPTION

HBEP could create significant adverse impacts on energy resources if alternatives reduced 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.

Project Configuration

HBEP would be a combined cycle power plant. Each of the two new power blocks would generate electric power by utilizing three gas turbines and a STG (steam turbine generator) operating on heat energy recovered from the gas turbine exhaust (HBEP 2012a, AFC §§ 2.1.3, 2.1.4). By recovering this heat, which would otherwise be lost up the exhaust stacks, the efficiency of any combined cycle power plant is increased considerably from that of either gas turbines or 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 applicant proposes to install evaporative inlet air coolers, single-pressure HRSGs, steam turbine units, and power cycle cooling systems (air-cooled condensers) (HBEP 2012a, AFC §§ 2.1, 2.1.3, 2.1.4). Staff believes these features provide meaningful efficiency enhancements to HBEP. The three-on-one combustion turbine/HRSG configuration is also highly efficient during unit turndown since one gas turbine can be shut down, leaving the other two fully loaded. This allows the efficient operation of two gas turbines instead of the operation of three gas turbines operating at a less efficient part load to generate the number of MWs.

The HBEP's design would incorporate AES' proprietary rapid start technology, which would allow the combustion turbine to reach base load more quickly as well as increase the ramping rate for both loading and unloading the power trains while operating in a load following mode of operation.[4] AES's approach is designed to start quickly, and while in start-up phase, operate at an efficiency rating comparable to a typical simple cycle plant. Within a relatively short period of time, the steam turbine generator would begin producing power. The plant would then operate at near a typical combined cycle efficiency rating.[5]

Equipment Selection

The M501DA gas turbine is the basic building block for the three-on-one combined cycle system. The M501DA provides a combination of efficiency and operating history comparable to the industry competition. The applicant would provide two independent three-on-one power blocks, each with an ISO[6] rated capacity (GTW 2013)[7] of 506.2 MW and 51.8 percent combined cycle efficiency. The stand-alone simple cycle capacity for the M501DA CTG is 113.95 MW at 34.9 percent efficiency (9,780 Btu/kWh[8] LHV).[9] HBEP would employ AES' rapid start technology which would effectively reduce the time required for startup and shutdown of the turbine generators having similar thermal efficiency.

One alternative CTG with similar capacity, efficiency and rapid start-up features is the General Electric (GE) LMS100 aeroderivative CTG with an ISO rating of 98.2 MW at 45 percent (7,580 Btu/kWh LHV) in a simple cycle configuration.[10] Where the simple cycle efficiency of the M501DA is lower than the LMS100 (34.9 percent vs. 45 percent, respectively), the MHI gas turbine nominal capacity exceeds GE by 15.75 MW (113.95 MW vs. 98.2 MW). Used in a 3 x 1 configuration, this capacity difference would be magnified three times to about 9 percent (15.75 x 3)/506.2 = 0.093).

Selecting between these machines is also based on commercial availability. The M501DA model has over two decades of operational history and has been commercially available since 1980.[7] (Also see analysis below under **NATURAL GAS-BURNING TECHNOLOGIES**.)

Efficiency of Alternatives to the Project

HBEP's objectives include the generation of base load electricity and load-following all hours of the day to serve energy requirements from the California Independent Systems Operator (CAlSO) (HBEP 2012a, AFC §§ 1.2, 2.1, 6.1).

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[4] Refer to e-mail from Stephen O'Kane/AES to Chris Perri/SCAQMD dated 12/1/9/12, which discusses AES' approach toward maximizing part load operation and minimizing ramp times.

[5] For further discussion of fast-start, combined cycle gas turbine systems, refer to "Gas Turbine Combined Cycle Fast Start: The Physics Behind the Concept," Power Engineering, June 2013 edition pp. 40-49.

[6] ISO (International Organization for Standardization): In this case, ISO Standard 27.040 for measurement of gas and steam turbine capacity.

[7] pg. 28, "2013 GTW Combined Cycle Specs," Gas Turbine World 2013 Handbook, January-February 2013.

[8] Kilo Watt hours

[9] ibid., pg. 18, "Simple Cycle OEM Ratings"

[10] ibid., pg. 15.

Alternative Generating Technologies

Alternative generating technologies for HBEP are considered in the AFC (HBEP 2012a, AFC §§ 1.5, 6.6). For purposes of this analysis, solar thermal technology, other fossil fuels, nuclear, biomass, hydroelectric, wind, and geothermal technologies are all considered. Given the project objectives, location, air pollution control requirements, and the commercial availability of the above technologies, staff agrees with the applicant that only natural gas-burning technologies (whether coupled with solar technology or not) are feasible.

Natural Gas-Burning Technologies

Fuel consumption is one of the most important economic factors in selecting an electric generator; fuel typically accounts for over two-thirds of the total operating costs of a fossil 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 base load combined cycle power plant typically offers a higher efficiency range than a combined cycle plant intended to provide operating flexibility (i.e.; quick start and load following capabilities), such as HBEP. Despite this efficiency advantage, a base load plant would not meet the project objective of providing operating flexibility.

The MHI501DA A possible alternative to a small aeroderivative CTG is to upsize to a 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. In actual operation, one would expect to see the difference in efficiency diminish, since larger-capacity G-class turbines 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 applicant’s decision to purchase the M501 series machines is reasonable.

Another possible alternative to the 501 class advanced gas turbine is an H-class next generation machine with a claimed fuel efficiency of 60 percent LHV 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 applicant’s decision to use the smaller, more flexible M501 model.

As an alternative to HBEP, retrofitting the existing AES Huntington Beach Generating Station while maintaining the existing boilers would not provide the operating flexibility and efficiency improvement offered by the M501DA or equivalent modern gas turbines in a combined cycle 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 necessitates the use of a substantial amount of ammonia. 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 applicant's choice of an evaporative gas turbine inlet air cooling system would have no significant adverse energy impacts.

Alternative Heat Rejection System

The applicant 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 RH (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 limitation of using existing water supplies, the applicant 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.

Staff concludes that the selected project configuration (rapid response combined cycle) and generating equipment (M501DA gas turbines and associated cooling systems) represent the most efficient feasible combination for satisfying the project's objectives. The three-on-one combustion turbine/HRSG configuration also allows for high efficiency during unit turndown, shutting down one combustion turbine down, leaving the others fully loaded. This offers an efficiency advantage over the larger machines during unit turndown. There are no alternatives that would significantly reduce energy consumption while satisfying the project's objectives of producing base load electricity and ancillary load-following services.

Staff, therefore, believes that HBEP would not create a significant adverse impact on energy resources.

CUMULATIVE IMPACTS

The only industrial facility proximate to the project site is the proposed Poseidon project, a 50 million gallon per day (mgd) desalinization plant, which would share the same industrial site as HBEP. The Poseidon project would not consume natural gas for its operation. Thus, it would not create a cumulative energy impact when combined with HBEP. Staff knows of no other projects that could produce cumulative energy impacts.

Staff believes that the construction and operation of the project would not create indirect impacts that would have otherwise occurred without this project. Older, less efficient power plants consume more natural gas than new, more efficient plants such as HBEP. Natural gas is burned by the most competitive power plants on the spot market, and the most efficient plants run the most frequently provided that they meet their objectives. The high efficiency of the proposed HBEP should allow it to compete favorably, run at high capacity, and replace less efficient power generating plants.

The project would therefore not impact the cumulative amount of natural gas consumed for power generation.

NOTEWORTHY PUBLIC BENEFITS

The applicant expects to increase power supply reliability in the California electricity market by both meeting 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-start capabilities provides system simplicity, efficiency and flexibility. Employing these features by replacing the existing electrical generation facilities, which are old and relatively inefficient, HBEP would benefit California's electricity consumers.

CONCLUSIONS AND RECOMMENDATIONS

HBEP, if constructed and operated as proposed, would generate 939 megawatts (MW) (gross output at ISO conditions) of electricity at an overall project fuel efficiency of 46 percent LHV. While it 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.

PROPOSED CONDITIONS OF CERTIFICATION

No conditions of certification are proposed.

REFERENCES

GTW 2013 — Gas Turbine World 2013 performance specs, 30th Edition.

HBEP 2012a – AES Southland Development, LLC / Stephen O’Kane (tn 66003). A*pplication for Certification (AFC), Volume I & II, dated, June 27, 2012*. Submitted to CEC/Dockets on 06/27/2012.

POWER PLANT RELIABILITY

Testimony of Edward Brady and Shahab Khoshmashrab

SUMMARY OF CONCLUSIONS

The applicant predicts an equivalent availability factor[1] of 98 percent, which staff believes is achievable. Based on a review of the proposal, staff concludes that the Huntington Beach Energy Project (HBEP) 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 (staff) addresses the reliability issues of HBEP to determine if the power plant 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.

Staff 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 applicant has predicted an equivalent availability factor of 98 percent for the HBEP project (see below), staff has used the above benchmarks as appropriate industry norms to evaluate the project’s reliability.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

No federal, state, or local/county laws, ordinances, regulations, or standards (LORS) apply to the reliability of this project.

[1] Equivalent availability factor is the percentage of time a unit is available for dispatch, and reflects the probability of forced (unexpected) outages.

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 (ISO), which purchase, dispatch, and sell electricity throughout the state. How the 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 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 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 939 megawatt (MW) (nominal gross output) HBEP project with operating flexibility (that is, the ability 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.

The project is expected to achieve an equivalent availability factor of 98 percent (HBEP 2012a, AFC § 2.6.1). The project's annual capacity factor[2] is expected to be in the range of 35-50 percent (HBEP 2012a, AFC § 2.7).

[2] Capacity factor is a measure of how much electricity a power plant actually produces during the year as compared to the maximum power it could produce at continuous full power operation during the same period of time. For example, a capacity factor of 35 percent means that the plant would operate 3,066 hours in a year (8,760 hours).

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, CCR § 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 availability factor 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 HBEP project will be as reliable as other power plants on the electric system and will not degrade system reliability.

EQUIPMENT AVAILABILITY

Equipment availability would be ensured by adopting appropriate quality assurance/quality control (QA/QC) 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

The applicant describes a quality assurance/quality control (QA/QC) program (HBEP 2012a, AFC § 2.6.6) that is typical of the power industry. Equipment would be purchased from qualified suppliers based on technical and commercial evaluations. Suppliers' personnel, production capability, past performance, QA/QC programs and quality history would be evaluated. The project owner would perform receipt inspections, test components, and administer independent testing contracts. Staff expects 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 applicant plans to provide an appropriate redundancy of function for the project (HBEP 2012a, AFC § 2.6.2, Table 2.6-1). Because the project consists of two 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 applicant would base the project's maintenance program on those recommendations (HBEP 2012a, AFC § 2.6.1). 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 would be delivered to the HBEP project via an existing 16-inch diameter Southern California Gas Company (SoCalGas) line (HBEP 2012a, AFC §§ 2.1.7, 2.6.3). SoCalGas has confirmed its system's adequate capacity to supply the project; a will-serve letter is included in AFC Appendix 4A. 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 HBEP project would use water from the City of Huntington Beach for power plant cooling, process water, fire protection and potable water. A will-serve letter from the City of Huntington Beach is provided in AFC Appendix 5.15A. 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 (HBEP 2012a, AFC § 2.5.2); see the **GEOLOGY AND PALEONTOLOGY** section of this document. The project would be designed and constructed to the latest appropriate LORS (HBEP 2012a, AFC Appendix 2C). 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

The project site is outside the 100-year floodplain (HBEP 2012a, AFC § 5.15.1.3). 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.

Tsunami

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. 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 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 California Building Code 2010. 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 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, and periodically summarizes and publishes those statistics on the Internet [http://www.nerc.com]. The NERC reported the following generating unit statistic for the years 2005 through 2009 (NERC 2010):

For combined cycle units (all MW sizes):

Availability Factor = 89.54 percent

The project's gas turbines have been on the market for several years and are expected to exhibit typically high availability. The applicant's expectation of an annual availability factor of 98 percent (HBEP 2012a, AFC § 2.6.1) appears reasonable when compared with NERC figures for similar plants throughout North America (see 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. Additionally, because the plant would consist of two generating trains, maintenance can be scheduled during times of the year when the full plant output is not required to meet market demand, which is typical of industry standard maintenance procedures. The applicant's estimate of 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, and staff believes they would ultimately produce an adequately reliable plant.

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 project consists of two 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.

CONCLUSION

The applicant predicts an equivalent availability factor of 98 percent, which staff believes is 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

HBEP 2012a – AES Southland Development, LLC / Stephen O'Kane (tn 66003). A*pplication for Certification (AFC), Volume I & II, dated, June 27, 2012*. Submitted to CEC/Dockets on 06/27/2012.

NERC (North American Electric Reliability Council). 2010. 2005–2009 Generating Availability Report.

TRANSMISSION SYSTEM ENGINEERING

Testimony of Laiping Ng and Mark Hesters

SUMMARY OF CONCLUSIONS

The proposed Huntington Beach Energy Project (HBEP) facilities including the new generators and the Southern California Edison (SCE) Huntington Beach Switching Station with the step-up transformers, the 230 kV overhead transmission lines, and terminations are acceptable and would comply with all applicable laws, ordinances, regulations, and standards (LORS). The HBEP interconnection with the transmission grid would not require additional downstream transmission facilities (other than those proposed by the applicant) that require California Environmental Quality Act (CEQA) review.

- Interconnection of the HBEP would not trigger any downstream transmission system upgrades.
- The existing breakers are adequate to withstand the post-project incremental fault currents.
- The Ellis Substation would require a further review of the substation ground grid duty. If the Ground Grid Evaluation shows there is a need for a ground grid upgrade, the upgrade would occur inside the substation and no downstream environment impacts are anticipated.

INTRODUCTION

STAFF ANALYSIS

This Transmission System Engineering (TSE) analysis examines whether or not the facilities associated with the proposed interconnection conform to all applicable LORS required for safe and reliable electric power transmission. Additionally, under the CEQA, the Energy Commission must conduct an environmental review of the “whole of the action,” which may include facilities not licensed by the Energy Commission (Cal Code Regs, tit 14, §15378). Therefore, the Energy Commission must identify the system impacts and necessary new or modified transmission facilities that would be required downstream of the proposed interconnection and that represent the “whole of the action.”

Energy Commission staff analyzes studies performed by the interconnecting authority, in this case the California Independent System Operator (California ISO), to determine the impacts on the transmission grid from the proposed interconnection. Staff’s analysis also identifies new or modified facilities downstream of the first point of interconnection that may require mitigation measures. The proposed project would connect to the SCE transmission network and requires analysis by SCE and approval of the California ISO.

ROLE OF SOUTHERN CALIFORNIA EDISON

SCE is responsible for ensuring electric system reliability on its transmission system with the addition of the proposed transmission modifications, and determines both the standards necessary to ensure reliability and whether the proposed transmission modifications conform to existing standards. The California ISO will provide analysis in its Phase I and Phase II Interconnection Studies, its approval for the facilities, and changes required in its system to add the proposed transmission modifications.

ROLE OF CALIFORNIA INDEPENDENT SYSTEM OPERATOR

The California ISO is responsible for dispatching generating units in California, ensuring electric system reliability for all participating transmission owners and for developing the standards and procedures necessary to maintain system reliability. The California ISO will review SCE's studies to ensure the adequacy of the proposed HBEP transmission interconnection. The California ISO will also determine if the proposed transmission modifications of the SCE transmission system will impact overall system reliability. According to the California ISO Tariff, it will determine the need for transmission additions or upgrades downstream from the interconnection point to ensure reliability of the transmission grid. The California ISO will, therefore, perform the Phase I Interconnection Study and provide its analysis, conclusions, and recommendations. The Phase II Interconnection Study includes the California ISO conclusions and recommendations. If necessary, the California ISO will provide written and verbal testimony on its findings at the Energy Commission hearings.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

- California Public Utilities Commission (CPUC) General Order 95 (GO-95), "Rules for Overhead Electric Line Construction," formulates uniform requirements for construction of overhead lines. Compliance with this order ensures adequate service and safety to persons engaged in the construction, maintenance and operation or use of overhead electric lines and to the public in general.
- California Public Utilities Commission (CPUC) General Order 128 (GO-128), "Rules for Construction of Underground Electric Supply and Communications Systems," formulates uniform requirements and minimum standards to be used for underground supply systems to ensure adequate service and safety to persons engaged in the construction, maintenance and operation or use of underground electric lines and to the public in general.
- The National Electric Safety Code, 1999 provides electrical, mechanical, civil and structural requirements for overhead electric line construction and operation.

- NERC/WECC Planning Standards: The Western Electricity Coordinating Council (WECC) Planning Standards are merged with the North American Electric Reliability Council (NERC) Planning Standards and provide the system performance standards used in assessing the reliability of the interconnected system. These standards require the continuity of service to loads as the first priority and preservation of interconnected operation as a secondary priority. Certain aspects of the NERC/WECC standards are either more stringent or more specific than the NERC standards alone. These standards provide planning for electric systems so as to withstand the more probable forced and maintenance outage system contingencies at projected customer demand and anticipated electricity transfer levels, while continuing to operate reliably within equipment and electric system thermal, voltage and stability limits. These standards include the reliability criteria for system adequacy and security, system modeling data requirements, system protection and control, and system restoration. Analysis of the WECC system is based to a large degree on Section I.A of the standards, “NERC and WECC Planning Standards with Table I and WECC Disturbance-Performance Table” and on Section I.D, “NERC and WECC Standards for Voltage Support and Reactive Power”. These standards require that the results of power flow and stability simulations verify defined performance levels. Performance levels are defined by specifying the allowable variations in thermal loading, voltage and frequency, and loss of load that may occur on systems during various disturbances. Performance levels range from no significant adverse effects inside and outside a system area during a minor disturbance (loss of load or a single transmission element out of service) to a level that seeks to prevent system cascading and the subsequent blackout of islanded areas during a major disturbance (such as loss of multiple 500 kV lines along a common right of way, and/or multiple generators). While controlled loss of generation or load or system separation is permitted in certain circumstances, their uncontrolled loss is not permitted (WECC 2006).
- North American Reliability Council (NERC) Reliability Standards for the Bulk Electric Systems of North America provide national policies, standards, principles and guidelines to assure the adequacy and security of the electric transmission system. The NERC Reliability Standards provide for system performance levels under normal and contingency conditions. With regard to power flow and stability simulations, while these Reliability Standards are similar to NERC/WECC Standards, certain aspects of the NERC/WECC Standards are either more stringent or more specific than the NERC Standards for Transmission System Contingency Performance. The NERC Reliability Standards apply not only to interconnected system operation but also to individual service areas (NERC 2006).

- 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 and stability simulations, 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 found in the WECC/NERC or NERC Standards. 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 (California ISO 2002a).
- California ISO/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 (California ISO 2007a).

PROJECT DESCRIPTION AND INTERCONNECTION FACILITIES

The Huntington Beach Energy Project would be a natural-gas-fired, combined-cycle generating facility located in the City of Huntington Beach, Orange County, California. The HBEP would consist of two power blocks. Each power block has three combustion turbine-generators (CTG) and one steam turbine generator (STG). Each CTG is expected to generate 114 megawatts (MW) and the STG is expected to generate 145 MW under average ambient conditions. A total of six CTGs and two STGs would generate a maximum output of 974 MW. With the generator auxiliary load of approximately 35 MW, the net output of the HBEP to the transmission grid would be 939 MW. The HBEP would be interconnected to the SCE Huntington Beach Switching Station. The proposed commercial operation date of the HBEP power block 1 is third quarter 2018 and the power block 2 is second quarter 2020.

The combustion turbine generators are each rated at 119.8 Megavolt Ampere (MVA) with a power factor of 0.95, and the steam turbine generators each rated at 152.8 MVA with a power factor of 0.95. For power block 1, combustion turbine generators unit 1, unit 2, and unit 3 would each be connected through their own 8,000-ampere generator circuit breaker through a short 5,000-ampere isolated phase bus duct to the low side of its dedicated 73/97/122 MVA generator step-up (13.8/230 kV) transformer. The steam turbine generator unit 1 would be connected through its own 8,000-ampere generator circuit breaker via a short 7,000-ampere isolated phase bus duct to the low side of its dedicated 93/124/155 MVA generator step-up (13.8/230 kV) transformer. The high side of each generator step-up transformer would be connected to the project switchyard through a 600-ampere disconnect switch and overhead conductors.

The auxiliary load, approximately 17.5 MW for power block 1, would be provided by CTG unit 2 and STG unit 1, through its dedicated 500-ampere isolated phase bus ducts and their dedicated back-fed step-down (13.8/4.16 kV) transformers. The high sides of the transformers would each be connected through their dedicated 600-ampere disconnect switches to the common generator tie bus. A single 230 kV generator tie-line would connect power block 1 through a 2,000-ampere circuit breaker and a 2,000-ampere motor-operated disconnect switch to the SCE 230 kV Huntington Beach Switching Station via 1033.5 ACSS overhead generator tie-line which is approximately 0.22 mile long.

For power block 2, combustion turbine generators unit 4, unit 5, unit 6, and steam turbine generator unit 2 would have the same ratings and similar arrangement as the CTGs and STG of the power block 1. The auxiliary load for power block 2 would be provided by CTG unit 5 and STG unit 2. The high sides of the transformers would each be connected through their dedicated 600-ampere disconnect switches to the common generator tie bus. A single 230 kV generator tie-line would connect power block 2 through a 2,000-ampere circuit breaker and a 2,000-ampere motor-operated disconnect switch to the SCE 230 kV Huntington Beach Switching Station via 1033.5 ACSS overhead generator tie-line approximately 0.16 mile long.

The two 230 kV generator tie-lines, supported by single-circuit steel structures, would be built with 1033.5 kcmil ACSS conductor. The generator tie-lines would leave the power blocks connect to the Huntington Beach Switching Station. The Huntington Beach Switching Station is connected to the SCE Ellis Substation. Power would be transmitted to the grid from the Ellis Substation (HBEP 2012a, HBEP 2012c section 1, section 2, section 3, Figure 2.1-4R, Figure 3.1-1R, Figure 3.1-2R, HBEP 2014c[1]).

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

For the interconnection of a proposed generating unit or transmission facility to the grid, the interconnecting utility (SCE in this case) and the control area operator (California ISO) are responsible for ensuring grid reliability. These entities determine the transmission system impacts of the proposed project, and any mitigation measures needed to ensure system conformance with performance levels required by utility reliability criteria, NERC planning standards, WECC reliability criteria, and California ISO reliability criteria. The Phase I and Phase II Interconnection Studies are used to determine the impacts of the proposed project on the transmission grid. Staff relies on these studies and any review conducted by the California ISO to determine the project's effect on the transmission grid and to identify any necessary downstream facilities or indirect project impacts required to bring the transmission network into compliance with applicable reliability standards.

[1]The figure docketed under this submittal was incorrectly titled. Staff contacted AES on April 22, 2014 and requested that the figure be resubmitted with the correct title.

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

If the Phase I and Phase II Interconnection Studies show that the interconnection of the project causes the grid to be out of compliance with reliability standards, then the studies will identify mitigation alternatives or ways in which the grid could be brought into compliance with reliability standards. When a project connects to the grid controlled by California ISO, both the studies and mitigation alternatives must be reviewed and approved by the California ISO. If the mitigation identified by California ISO or interconnecting utility includes transmission modifications or additions that require CEQA review as part of the "whole of the action," the Energy Commission must analyze the environmental impacts of these modifications or additions.

CALIFORNIA INDEPENDENT SYSTEM OPERATOR STUDY

The California ISO has completed the Queue Cluster 5 Projects Phase II Interconnection Study Report (Phase II Interconnection Study) which includes the HBEP and other proposed generators. The analysis of the interconnection impacts of the HBEP will be based on the Phase II Interconnection Study.

SCOPE OF QUEUE CLUSTER 5 PHASE II INTERCONNECTION STUDY

The December 3, 2013, Queue Cluster 5 Phase II Interconnection Study Report was prepared by the California ISO in coordination with SCE. The Phase II Interconnection Study modeled the HBEP project with a net output of 939 MW.

The Power Flow base cases use the 1-in-10 year load forecast for the reliability assessment and use the 1-in-5 year load forecast for the deliverability assessment in the SCE Area. The base cases were based on a 2016 load forecast peak and off-peak conditions included all generation projects in earlier queued Serial Group and clusters, the associated Network Upgrades and Special Protection Systems, as well as all the California ISO approved transmission upgrade projects.

The power flow studies were conducted using 2016 summer peak and 2016 summer off-peak base cases with and without the proposed QC5 generation projects interconnect to the SCE grid at each project's proposed interconnection point. The Power Flow study assessed the QC5 generation projects' impact on thermal loading of the transmission lines and equipment. Short circuit studies were conducted to determine if the QC5 generation projects would overstress existing substation facilities. Transient Stability Analysis was conducted to determine whether the QC5 generation projects would create instability in the system following certain selected outages. Post-Transient Voltage Stability Analysis was conducted to determine whether the generation projects would create voltage deviations in the system following lines and equipment outages. Reactive Power Deficiency analysis was conducted to study the transmission line voltage drops cause by selected outages (HBEP 2013pp Section B, Appendix A).

PHASE II INTERCONNECTION STUDY RESULTS FOR QC5 PROJECTS

Power Flow Study Results and Mitigation Measures

The QC5 Phase II Interconnection Study identified no pre-project and no post project overload criteria violations under the 2016 summer peak and the 2016 summer off-peak load study conditions. Interconnection of the QC5 projects along with the proposed HBEP project will not cause any transmission lines overloads under normal and contingency conditions. No mitigation is required. The Power Flow Study indicated that with all the California ISO approved transmission upgrade projects in place, the transmission system is able to accommodate the HBEP and the QC5 generation projects under normal and contingency conditions (HBEP 2013pp, Appendix A Section D, Section F).

Short Circuit Analysis and mitigation Measures

Short Circuit studies were performed to determine the degree to which the addition of the QC5 generation projects increase fault duties at SCE substations, adjacent utility substations, and the other 66 kV, 115 kV, 230 kV and 500 kV busses within the study area. The fault duties were calculated with and without the QC5 generation projects to identify any equipment overstress conditions. Buses electrically adjacent to QC5 generation projects and their short circuit duties are listed in QC5 Phase II Appendix H of the Queue QC5 Phase II Interconnection Study Report.

The short circuit study identified that with the circuit breaker upgrades required by the previous queue or clusters, no additional breaker upgrades are required for the interconnection of the QC5 generation projects.

The Ground Grid Evaluation of the SCE substations indicated that the Ellis Substation would require a further review of the substation ground grid duty. The ground grid must possess sufficient thermal capacity to pass the highest fault current for the required time. If the Ground Grid Evaluation shows there is a need for a ground grid upgrade, the upgrade would occur inside the substation and no downstream environment impacts will be anticipated (HBEP 2013pp Section D, Appendix A Section D, Section F).

Transient Stability Study Results and Mitigation Measures

Transient stability studies were conducted using the 2016 summer peak and 2016 summer off-peak load base cases to ensure that the transmission system remained in operating equilibrium, as well as operating in a coordinated fashion, through abnormal operating conditions after the QC5 generation projects became operational. Disturbance simulations were performed for a study period of 10 seconds to determine whether the QC5 generation projects would create any system instability during line and generator outages. The Transient Stability study result indicated that the QC5 generation projects along with the HBEP would not cause adverse impacts on the stable operation of the transmission system following the selected Category “B” and Category “C” outages (HBEP 2013pp Section D, Appendix A Section D).

POST-TRANSIENT VOLTAGE ANALYSIS RESULTS

Post-Transient Stability Analysis was conducted using the 2016 summer peak and 2016 summer off-peak base cases. NERC/WECC planning standards require that with the addition of the QC5 generation projects, the SCE system post-transient voltage deviation within 5% of the pre-project level under Category B contingencies and within 10% of pre-project levels under Category C contingencies. The Post-Transient Stability Analysis indicated that the addition of the QC5 generation projects would not cause any adverse impacts to the SCE system (HBEP 2013pp Section D).

Reactive Power Deficiency Analysis Results

Reactive power deficiency analysis was performed to determine the system performance according to the NERC/WECC planning criteria. The reactive power deficiency analysis indicated that the addition of the QC5 generation projects including the HBEP and with all the Delivery Network Upgrades for the QC5 generation projects would not contribute to any reactive power margin violations at SCE buses following selected Category “B” and Category “C” contingencies (HBEP 2013pp Appendix Section F).

CUMULATIVE IMPACTS

The TSE analysis focuses on whether or not a proposed project will meet required codes and standards. At all times the transmission grid must remain in compliance with reliability standards, whether one project or many projects interconnect. Potential cumulative impacts on the transmission network are identified through the California ISO and utility generator interconnection process. In cases where a significant number of proposed generation projects could affect a particular portion of the transmission grid, the interconnecting utility or the California ISO can study the cluster of projects in order to identify the most efficient means to interconnect all of the proposed projects.

COMPLIANCE WITH LORS

The proposed interconnecting facilities include the HBEP 230 kV switchyard, two 230 kV overhead generator tie-lines, and the termination at the SCE Huntington Beach Switching Station are adequate in accordance with industry standards and good utility practices, and are acceptable to staff. Staff believes that existing Conditions of Certification TSE-1 through TSE-5 will ensure the proposed HBEP complies with applicable LORS:

Staff's proposed conditions of certification TSE-1 through TSE-5 would help ensure that construction and operation of the transmission facilities for the proposed HBEP would comply with applicable LORS:

1. Staff proposed Condition of Certification TSE-1 to ensure that the preliminary equipment is in place for construction of the transmission facilities of the proposed project to comply with applicable LORS.

2. Staff proposed Condition of Certification TSE-2 to ensure the final design of the proposed transmission facilities would comply with applicable LORS.

3. Staff proposed Condition of Certification TSE-3 to ensure that the proposed project would be properly interconnected to the transmission grid. TSE-3 also ensures that the generator output would be properly delivered to the transmission system.

4. Staff proposed Condition of Certification TSE-4 to ensure that the project would synchronize with the existing transmission system and the operation of the facilities would comply with applicable LORS.

5. Staff proposed Condition of Certification TSE-5 to ensure that the proposed project has been built to required specifications and the operation of the facilities would comply with applicable LORS.

CONCLUSIONS AND RECOMMENDATIONS

- The proposed HBEP facilities between the new generators and the SCE Huntington Beach Switching Station including the step-up transformers, the 230 kV overhead transmission lines, and terminations are acceptable and would comply with all applicable LORS. The HBEP interconnection with the transmission grid would not require additional downstream transmission facilities (other than those proposed by the applicant) that require CEQA review.
- Interconnection of the HBEP would not trigger any downstream transmission system upgrades.
- The existing breakers are adequate to withstand the post-project incremental fault currents.
- The Ellis Substation would require a further review of the substation ground grid duty. If the Ground Grid Evaluation shows there is a need for a ground grid upgrade, the upgrade would occur inside the substation and no downstream environment impacts are anticipated.

PROPOSED 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: Prior to the start of construction of transmission facilities, 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 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 For the power plant switchyard, outlet line and termination, the project owner shall not begin any construction until plans for that increment of construction 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: 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 verifying compliance with all applicable LORS, and send the CPM a copy of the transmittal letter in the next monthly compliance report.

TSE-3 The project owner shall ensure that the design, construction, and operation of the proposed transmission facilities will conform to all applicable LORS, and the requirements listed below. The project owner shall submit the required number of copies of the design drawings and calculations, as determined by the CBO. Once approved, the project owner shall inform the CPM and CBO of any anticipated changes to the design, and shall submit a detailed description of the proposed change and complete engineering, environmental, and economic rationale for the change to the CPM and CBO for review and approval.

a) The power plant 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*, California ISO standards, National Electric Code (NEC) and related industry standards.

b) Breakers and busses in the power plant switchyard and other switchyards, where applicable, shall be sized to 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 of the project.

e) Termination facilities shall comply with applicable SCE interconnection standards.

f) The project owner shall provide to the CPM:

i) Special Protection System (SPS) sequencing and timing if applicable,

ii) A letter stating that the mitigation measures or projects selected by the transmission owners for each reliability criteria violation, for which the project is responsible, are acceptable,

iii) A copy of the executed LGIA signed by the California ISO and the project owner and approved by the Federal Energy Regulatory Commission.

Verification: Prior to the start of construction or start of modification of transmission facilities, the project owner shall submit to the CBO for approval:

a) Design drawings, specifications, and calculations conforming with CPUC General Order 95 or National Electric Safety Code (NESC); Title 8 of the California Code and Regulations (Title 8); Articles 35, 36 and 37 of the *High Voltage Electric Safety Orders*, CA ISO standards, National Electric Code (NEC) and related industry standards, 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 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*, California ISO standards, National Electric Code (NEC), and related industry standards;

c) Electrical one-line diagrams signed and sealed by the registered professional electrical engineer in charge, a route map, and an engineering description of the equipment and configurations covered by requirements **TSE-3** a) through f);

d) Special Protection System (SPS) sequencing and timing if applicable shall be provided concurrently to the CPM.

e) A letter stating that the mitigation measures or projects selected by the transmission owners for each reliability criteria violation, for which the project is responsible, are acceptable,

f) A copy of the executed LGIA signed by the California ISO and the project owner and approved by the Federal Energy Regulatory Commission.

Prior to the start of construction of or modification of transmission facilities, the project owner shall inform the CBO and the CPM of any anticipated changes to the design that are different from the design previously submitted and approved and shall submit a detailed description of the proposed change and complete engineering, environmental, and economic rationale for the change to the CPM and CBO for review and approval.

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

TSE-4 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 California 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-5 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.

b) An “as built” engineering description of the mechanical, structural, and civil portion of the transmission facilities signed and sealed by the registered engineer in responsible charge or acceptable alternative verification. “As built” drawings of the electrical, mechanical, structural, and civil portion of the transmission facilities shall be maintained at the power plant and made available, if requested, for CPM audit as set forth in the “Compliance Monitoring Plan”.

c) A summary of inspections of the completed transmission facilities, and identification of any nonconforming work and corrective actions taken, signed and sealed by the registered engineer in charge.

REFERENCES

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

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

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

California ISO (California Independent System Operator) 2007a – California ISO, FERC Electric Tariff, First Replacement Vol. No. 1, March, 2007.

California ISO (California Independent System Operator) 2009a – Large Generator Interconnection Procedures, ongoing.

California Public Utilities Commission (CPUC) General Order 95 (GO-95), *Rules for Overhead Electric Line Construction*, revised January 12, 2012 by Decision No. 12-01-032.

California Public Utilities Commission (CPUC) General Order 128 (GO-128), *Rules for Construction of Underground Electric Supply and Communications Systems.*

HBEP 2012a – AES Southland Development, LLC / Stephen O'Kane (tn 66003). *Application for Certification (AFC), Volume I & II, dated, 06/27/2012*. Submitted to CEC/ Dockets on 06/27/2012.

HBEP 2012c – Stoel Rives LLP / Melissa A. Foster (tn 66490). *Applicant's Data Adequacy Supplement, dated 08/06/2012.* Submitted to CEC/ Dockets on 08/06/2012.

HBEP 2013hh – Stoel Rives LLP / Melissa A. Foster (tn 200631). *California Independent System Operator's (CAISO)'s Phase I Interconnection Study Report (Transmission System Engineering) for HBEP, dated 09/24/13.* Submitted to CEC/Dockets on 09/24/2013.

HBEP 2013pp – Stoel Rives LLP / Melissa A. Foster (tn 201469). *CA ISO Cluster 5 Phase II Interconnection Study, dated 12/3/13.* Submitted to CEC/Dockets on 12/23/2013.

HBEP 2014c – Stoel Rives LLP / Kimberly Hellwig (tn 202095) *Applicant's Revised TSE Figure 3.1-1R, dated April 17, 2014*. Submitted to CEC/Dockets on 4/17/2014.

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

WECC (Western Electricity Coordinating Council) 2006 – NERC/WECC Planning Standards, August 2006.

DEFINITION OF TERMS

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, which provides that dispatched generation and transmission loading (imports) will not violate criteria.
Double–contingency condition	Also known as emergency or N-2 condition, a forced outage of two system elements usually (but not exclusively) caused by one single event. Examples of an N-2 contingency include loss of two transmission circuits on a 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 condition.
kcmil	One-thousand circular mil. A unit of the conductor's cross-sectional area divided by 1,273 to obtain the area in square inches.
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 equal to the product of the line voltage in kilovolts, current in amperes, the square root of 3, and divided by 1000.

Megawatt (MW) — A unit of power equivalent to 1,341 horsepower.

N-0 condition — See normal operation/normal overload.

Normal operation/normal overload (N-0) — When all customers receive the power they are entitled to without interruption and at steady voltage, and no element of the transmission system is loaded beyond its continuous rating.

N-1 condition — See single–contingency condition.

N-2 condition — See double–contingency condition.

Outlet — Transmission facilities (e.g., circuit, transformer, circuit breaker) linking generation facilities to the main grid.

Power flow analysis — A power flow analysis is a forward-looking computer simulation of essentially all generation and transmission system facilities that identifies overloaded circuits, transformers, and other equipment and system voltage levels.

Reactive power — Reactive power is generally associated with the reactive nature of motor loads that must be fed by generation units in the system. An adequate supply of reactive power is required to maintain voltage levels in the system.

Remedial action scheme (RAS) — A remedial action scheme is an automatic control provision, which, for instance, will trip a selected generating unit upon a circuit overload.

SF6 — Sulfur hexafluoride is an insulating medium.

Single–contingency condition — Also known as emergency or N-1 condition, occurs when one major transmission element (e.g., circuit, transformer, circuit breaker) or one generator is out of service.

Solid dielectric cable

Copper or aluminum conductors that are insulated by solid polyethylene-type insulation and covered by a metallic shield and outer polyethylene jacket.

Special protection scheme/system (SPS)

An SPS detects a transmission outage (either a single or credible multiple contingency) or an overloaded transmission facility and 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 and is used as an outlet for one or more electric generators.

Thermal rating — See ampacity.

TSE — Transmission System Engineering.

Tap — A transmission configuration creating an interconnection through a sort single circuit to a small- or medium-sized load or generator. The new single circuit line is inserted into an existing circuit by using 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

ALTERNATIVES

Testimony of Negar Vahidi and Scott Debauche[1]

INTRODUCTION

This section evaluates a reasonable range of potential alternatives to the proposed Huntington Beach Energy Project (HBEP or project). As the California Environmental Quality Act (CEQA) lead agency for the HBEP, the California Energy Commission (Energy Commission or staff) is required to identify and evaluate a range of reasonable alternatives to the project that would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects of the project. The guiding principles for selection of alternatives analyzed are consistent with CEQA Guidelines (Cal. Code Regs., tit. 14, §15000 et seq.). These guidelines are described in detail below in the subsection "CEQA Requirements."

Staff has reviewed the alternatives analysis provided by the project applicant within the HBEP Application for Certification (AFC) (HBEP 2012a). The information provided in the AFC served as a starting point for the alternatives analysis in this Final Staff Assessment (FSA). Additionally, alternatives analyzed within this section include those recommended through agency and public comment, as well as those developed by staff.

Alternatives that have been evaluated are either eliminated from further consideration or evaluated against the HBEP to determine if they meet the basic objectives of the HBEP and would reduce or avoid any adverse environmental impacts of the HBEP. As discussed below, only the No-Project Alternative was determined to warrant detailed analysis and comparison to the HBEP at this time. Alternatives eliminated from detailed analysis are also discussed in this section, including the reasons for their elimination.

SUMMARY OF CONCLUSIONS

Based on the analysis provided below in the subsection "Alternatives Eliminated From Detailed Consideration," the only alternative evaluated in detail is the No-Project Alternative, which consists of two power plant cooling retrofit scenarios of the existing Huntington Beach Generating Station (HBGS) compliant with the State Water Resources Control Board (SWRCB) Water Quality Control Policy on the Use of Coastal and Estuarine Waters for Power Plant Cooling. **Alternatives Table 1** provides a summary comparison of the HBEP environmental impacts and those of the No-Project Alternative. Based upon staff's analysis, the No-Project Alternatives' impacts would be similar to, less than, and in some instances greater than those of the HBEP. The No-Project Alternatives reduce potential HBEP impacts due to a decreased construction schedule and overall reduction in operating hours of the HBGS when compared to the HBEP. Increases in impacts of the No-Project Alternative when compared to the proposed HBEP are primarily associated with the construction of a recycled water pipeline as part of the wet cooling retrofit scenario. The dry cooling retrofit scenario

[1] Preparation of this alternatives section includes technical analysis and additional input completed by other Energy Commission staff. **Alternatives Appendix 1** of this staff assessment contains a list of staff contributors.

would meet half of the HBEP objectives and partially meet one objective. The wet cooling retrofit scenario would meet two HBEP objectives and partially meet two objectives. Neither retrofit alternative would meet the HBEP's objectives of providing efficient, reliable and flexible generation.

CEQA REQUIREMENTS

As the CEQA lead agency for the HBEP, the Energy Commission is required to consider and discuss alternatives to the HBEP. The guiding principles for the selection of alternatives for analysis are provided by the CEQA Guidelines (Cal. Code Regs., tit. 14, §15000 et seq.). According to §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 project, including alternatives that would be more costly or would otherwise impede the project's objectives; and
- Evaluate the comparative merits of the alternatives.

The lead agency is responsible for selecting a reasonable range of project alternatives for examination and must publicly disclose its reasoning for selecting those alternatives (Cal. Code Regs., tit. 14, §15126.6[a]). CEQA does not require an agency 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[f]). That is, the range of alternatives presented in this analysis is limited to those 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[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, and
3. Identify the environmentally superior alternative among the other alternatives (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[c]).

PROJECT OBJECTIVES

The process for selecting alternatives to evaluate begins with the establishment of project objectives. CEQA Guidelines §15124 define the requirement for a statement of objectives (Cal. Code Regs., tit. 14, §15124[b]):

> "A clearly written statement of objectives will help the lead agency develop a reasonable range of alternatives to evaluate in the EIR and will aid the decision makers in preparing findings or a statement of overriding considerations, if necessary. The statement of objectives should include the underlying purpose of the project."

The California Independent System Operator (CAISO) 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 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.

The objectives for the HBEP are identified below.

- Provide efficient, reliable and predictable power supply by using combined-cycle, natural gas-fired combustion turbines to replace the OTC generation;
- Support the local capacity requirements of Southern California's Western Los Angeles Basin;
- Develop a 939 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;
- Reuse existing electrical, water, wastewater, and natural gas infrastructures and land to minimize terrestrial resource and environmental justice impacts by developing on an existing brown field site;
- Site the project to serve the load area without constructing new transmission facilities; and
- Site the project on property that has industrial land use designation with consistent zoning.

ENERGY COMMISSION STAFF'S ALTERNATIVES SCREENING PROCESS

The California Environmental Quality Act Guidelines (State 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 State 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 State 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 HBEP 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 feasible alternatives that meet most of the basic project objectives, to determine whether such alternatives would avoid or substantially lessen project impacts identified as significantly adverse, and determine whether such alternatives would result in impacts that are the same, less than, or greater than those of the project; and
- Evaluate the comparative merits of the alternatives.

PUBLIC AND AGENCY PARTICIPATION

Staff, in determining the scope and content of this analysis, has considered verbal and written agency, general public, and intervener comments received to date regarding alternatives to the HBEP. Preparation of the HBEP alternatives analysis included staff's participation in the following:

- Energy Commission Preliminary Staff Assessment (PSA) Staff Workshop held in Huntington Beach, CA (TN 201890 April 3, 2014).
- Energy Commission Staff Workshop held in Huntington Beach, CA (TN 68291 November 14, 2012).

- Energy Commission Environmental Scoping Meeting and Informational Hearing held in Huntington Beach, CA (TN 67113 September 10, 2012).

The following identifies public and agency written comments received that pertains to the CEQA alternatives analysis of the HBEP:

- California Coastal Commission, TN 69246 (January 23, 2013) and TN 66483 (August 13, 2012): Requests that the alternatives analysis address the following:
  - Provide a comprehensive assessment evaluating alternative locations for currently proposed offsite construction activities that would result in coastal resource impacts (e.g., construction parking and staging that would adversely affect public access to the shoreline).
  - Potential alternative facility layouts that may reduce noise-related impacts.
  - Alternative configurations within the plant boundary could result in substantially fewer impacts to coastal resources; therefore, requests that the applicant provide for evaluation during the AFC proceedings feasible alternatives to the proposed locations of components of the various proposals to determine whether alternative layouts would avoid or reduce potential impacts to coastal resources, and requests that the application be supplemented to identify potential alternative locations for project components.
- City of Huntington Beach, TN 68804 – December 6, 2012: Requests that the alternatives analysis discuss the following:
  - Potential alternative facility layouts that would provide as much distance as possible from residences.
- Marinka Horack, TN 66382 – November 14, 2012: Requests that the alternatives analysis discuss alternative sites.
- Joanne Rasmussen, TN 68394 – November 5, 2012: Requests that the alternatives analysis discuss alternative facility layouts that may reduce noise-related impacts.
- Milton Dardis, TN 67501 – October 2, 2012: Requests that the alternatives analysis discuss alternative sites and alternative facility layouts that may reduce noise-related impacts.

RESPONSE TO AGENCY AND PUBLIC COMMENTS ON THE PRELIMINARY STAFF ASSESSMENT

Public and agency comments were provided in writing and verbally on the contents of the PSA during the public comment period and PSA workshop held on April 3, 2014. No public or agency comments on the Alternatives section of the PSA were received.

Comments received by the HBEP applicant on the Alternatives section of the PSA have been reviewed by staff and addressed as necessary within this FSA, with the following exceptions:

- <u>Applicant comments on the Technology Alternatives, Air Quality analysis</u>. Staff notes there is a typographical error in the applicant comments; the correct NOx emissions rate for HBEP is 0.064 lb/MWh (11lb/hr/172 MW = 0.064 lb/MWh).

- Applicant comments on the No-Project Retrofit Alternative, Socioeconomics analysis. Staff does not agree with the applicant's comment that the No-Project alternatives can have a lesser impact than HBEP as far as the potential to induce substantial population growth, the potential to necessitate replacement housing elsewhere, and the potential to impact police, schools, and parks and recreation. Staff also does not agree with the applicant's comment that staff's conclusions are unsupported with respect to lesser impacts from the No-Project alternatives. Staff provides reasoning to support the conclusions and stands by these conclusions.

ALTERNATIVES ELIMINATED FROM DETAILED CONSIDERATION

The CEQA Guidelines §15126.6(c) 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. 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, and Technology Alternatives. The following provides staff's reasons for eliminating these alternatives from detailed analysis.

ALTERNATIVE SITES

Relationship of the Proposed HBEP 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 discussion 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 project alternatives, and dismissal of off-site alternatives for further analysis.

Use of the Existing HBGS 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 HBEP would be constructed and operated at the existing HBGS site, which began operating in 1958 when it was owned by Southern California Edison (SCE). The power plant used fuel oil to produce electricity through its five generating units until the late 1980s when the generating units were converted for natural gas operation. In 1995, SCE retired generating Units 3 and 4 due to their limited use.

AES Southland Development, LLC, (AES) acquired the HBGS from SCE in 1998. In 2001, AES filed an Application for Certification with the Energy Commission to rebuild and upgrade (i.e., retool) Units 3 and 4 to meet increased electrical demand in California. The HBGS retool project for Units 3 and 4 was approved by the Energy Commission in 2001, and the total electrical generation capacity of the project was subsequently increased to 1,103 megawatts (MW). Units 1 through 5 were operational until October 2002. At that time, an order from South Coast Air Quality Management District resulted in the permanent removal of Unit 5 (a combustion turbine unit) from operation, and all permits for that unit were surrendered.

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(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 acknowledged that other conventional siting factors (e.g., local land use plans) could affect expansion opportunities. The Energy Commission study is not intended to be used to endorse specific sites or types and sizes of power plants for expansion.

The 1980 study describes expansion opportunities for various combinations of plant types and sizes at 20 of the 25 evaluated sites. The Huntington Beach power plant is characterized as having "moderate expansion opportunities" while avoiding sensitive habitat and designated resource areas (Energy Commission 1980). The proposed HBEP would be located inside the existing HBGS, and no off-site expansion of power plant facilities would be required.

City of Huntington Beach General Plan

The City of Huntington Beach (City) General Plan (General Plan) includes goals, policies, and maps pertaining to the Huntington Beach power plant, which is called the Edison Plant in some General Plan documents. References to the Edison Plant associate the power plant to the period when the plant was owned by SCE. The HBGS site is in an area designated as Public (P) in the Land Use Element (City of Huntington Beach 2013). Typical permitted uses include public utilities. The Land Use Element includes a "Community District and Subarea Schedule" that describes the intended functional role of each subarea. The existing HBGS is in Subarea 4G, Edison Plant, where permitted uses include "utility uses" and "wetlands conservation" (due to the wetland areas abutting the southeast border of the HBGS).

The Coastal Element was prepared to "meet the requirements of the Coastal Act and guide civic decisions regarding growth, development, enhancement and preservation of the City's Coastal Zone and its resources." The Coastal Element was initially certified by the Coastal Commission in 2001. A comprehensive update to the Coastal Element was completed by the City in 2011 to ensure consistency with the policies and format of the 1996 General Plan (City of Huntington Beach 2011). The Coastal Element includes a detailed discussion and inventory of existing land uses, facilities, and resources in the Coastal Zone. The existing project site is identified as a "regionally serving electrical generating plant." It is the policy of the Coastal Element to allow for the continuation, and in some cases expansion of energy facilities, while ensuring the community's public health and safety, environmental protection, and minimization of environmental impacts to the maximum extent feasible (City of Huntington Beach 2011). Applicable goals and policies include Goal C8: "Accommodate energy facilities with the intent to promote beneficial effects while mitigating any potential adverse impacts." Objective C8.2 addresses energy production: "Encourage the production of energy resources as efficiently as possible with minimal adverse impacts." (Please refer to the other resource sections of this staff assessment for further details on applicable General Plan policies, goals, and objectives.)

The General Plan recognizes the existing use of the HBGS site and includes references to potential proposals to expand or alter the facility. Provided that mitigation measures are implemented to reduce potentially significant effects, continued use of the site for energy production is consistent with the Coastal Element. The General Plan is internally consistent in its descriptions of the existing energy facility and the goals, policies, and objectives pertaining to its use for that purpose. Energy Commission staff continues to work with city staff on various compliance issues pertaining to development, construction, and operation of the proposed HBEP.

Potential for the Proposed HBEP to Contribute to Local Grid Capacity Requirements

CAISO regularly evaluates grid reliability issues in its balancing authority area for the state. The proposed HBEP would be located in the Los Angeles Basin (LA Basin) local reliability area, which requires a minimum amount of electrical generation to maintain grid reliability; the specific number of needed megawatts is reported in annual CAISO transmission plan studies. The shutdown of the San Onofre Nuclear Generating Station (SONGS) in 2013 and the SWRCB policy restricting the use of coastal waters for the once-through cooling of power plants could significantly reduce the amount of generation available in the LA Basin. The most recent CAISO Transmission Plan evaluates the potential impacts of the SONGS shutdown and the SWRCB once-through cooling policy on grid reliability in California.

Approximately 30% of California's in-state generating capacity (gas and nuclear power) uses coastal and estuarine water for the once-through cooling (OTC) systems of power plants. On May 4, 2010, the SWRCB adopted a statewide policy (OTC Policy) on the use of coastal and estuarine waters for power plant cooling. The OTC Policy minimizes the use of coastal or estuarine water for OTC by power plants. Power plants in the LA Basin affected by this policy include the AES Alamitos facility (2,000 MW), the AES Huntington Beach facility (450 MW), and the AES Redondo Beach facility (1,310 MW). To comply with the OTC Policy, these generators must be retrofitted, repowered, or retired.

CAISO develops and publishes its annual Transmission Plan, which includes a comprehensive evaluation of the CAISO transmission grid identifying the upgrades required to successfully meet California's energy policy goals, maintain grid reliability requirements, and provide economic benefits to consumers. The most recent plan adopted by the CAISO Board of Governors, the 2012–2013 Transmission Plan, evaluates issues relating to power generators' compliance with the SWRCB ruling on OTC (CAISO 2013a), and includes an initial study of the long-term impacts of the SONGS shutdown.

The proposed HBEP is located within the LA Basin local reliability area. Absent SONGS (which provided 2,246 MW from Units 2 and 3 at full capacity), the CAISO projects a need for approximately 10,000 MW of generating capacity in the LA Basin (CAISO 2013a, page 128). A total of 11,789 MW of generation exists or is under construction in the LA Basin (CAISO 2013b, page 98). If the AES OTC plants are not retrofitted or repowered and are retired to comply with the OTC Policy, approximately 8,000 MW of capacity would be available in the LA Basin, which is insufficient capacity to meet the CAISO local area requirements. Use of the existing Huntington Beach site to help meet known local electrical capacity requirements makes practical sense given the site's history of power generation, the existing site infrastructure, and the uncertainty of identifying other potentially feasible sites to replace the HBGS in a highly developed and densely populated region.

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. AES owns and has full access to the HBGS site. No other site is identified where the project applicant 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, and 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. 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

As described earlier within the subsection "Public and Agency Participation," agency and public comments requested the alternatives analysis include alternative site configurations. As noted in these comments, the focus of this alternative was to lessen or avoid potential noise, visual, and coastal impacts. These three issues are discussed below.

- Noise: As identified in **Alternatives Table 1** and discussed in the **NOISE AND VIBRATION** section of this FSA, no significant construction or operational noise impacts to adjacent receptors (including both residential and biological resources) have been identified that could not be mitigated. With implementation of proposed noise conditions of certification related to construction noise of the HBEP, staff has determined the HBEP would be in compliance with all applicable noise performance standards and thresholds and result in less than significant impacts. Even if the HBEP on-site facilities were configured differently, similar construction noise impacts would occur because identical construction would happen, only at slightly different locations within the HBEP site boundary. Furthermore, construction staging and delivery of equipment would be similar or identical to the HBEP. With respect to operational noise, as required by Condition of Certification **NOISE-4**, when the project becomes operational, a noise survey would be conducted to ensure that the project would not exceed applicable city of Huntington Beach noise limits. Any site reconfiguration would require an identical measure. Noise staff has reviewed the proposed HBEP and concluded that reconfiguring the site layout would not significantly lessen or avoid any operational noise impacts.

- Visual Resources: Because of the visual prominence of the air cooled condensers, on-site buildings containing turbines and other components for each power block, an alternative that would involve reconfiguring the site was considered as a means to lessen the visual impacts of the HBEP. The proposed HBEP facilities would occupy a large percentage of the total site area, which would likely limit options to reconfigure the site. Given the high visibility of the project site overall, moving the visually prominent structures within the site would not reduce their visibility from sensitive viewpoints to any great extent. Visual Resources staff has proposed conditions of certification to reduce visual resources impacts of the HBEP. Visual Resources staff has reviewed the proposed HBEP layout and concluded that reconfiguring the site layout would not significantly lessen or avoid visual impacts.
- Coastal Resources: In the FSA, staff in each resource area has evaluated potential impacts on coastal resources. Based on the location of the HBEP near the coastline, any potentially feasible alternative site configuration would need to lessen impacts on important coastal resources and sensitive viewer groups and uses. The primary impacts on these coastal resources are described in the **NOISE AND VIBRATION** and **VISUAL RESOURCES** sections of this staff assessment. As discussed above, **Noise and Vibration** and **Visual Resources** staff concluded that reconfiguring the site layout would not significantly lessen or avoid noise or visual impacts.

If any alternative site configuration was determined to be potentially feasible, it would likely meet most of the basic project objectives. No alternative site configuration is likely to avoid or substantially lessen project impacts identified as significant; therefore, staff has eliminated alternative site configurations from further consideration.

TECHNOLOGY ALTERNATIVES

Technology alternatives to the HBEP were developed and considered by staff to lessen or avoid project impacts. These alternatives are primarily focused on reducing air quality impacts of the HBEP, as discussed below. As such, the following discussion utilizes nomenclature and terminology specific to air quality. For a full description of these terms and issues, please refer to the **AIR QUALITY** section of this FSA.

Generation Technology Alternatives

The generation technology alternatives evaluated by staff for the HBEP focus on technologies that can utilize natural gas, which can take advantage of the existing natural gas pipeline system and also meet the electrical capacity replacement requirements specified by SCAQMD's Rule 1304. Eligible technologies include combined-cycle technology, other advanced gas turbine(s), or a renewable energy resource.

- Conventional Boiler and Steam Turbine. This technology burns fuel in a conventional boiler to create steam, which is used to drive a steam turbine generator and then is condensed and returned to the boiler. Staff eliminated the conventional boiler and steam turbine technology from consideration because it would not qualify for the SCAQMD Rule 1304 exemption for offsets.

- Simple-Cycle Combustion Turbine. A simple-cycle combustion turbine has a quick startup and rapid ramping capabilities appropriate for a peaking facility. It is also possible to configure HBEP as a simple-cycle peaking facility. The proposed HBEP would have two blocks each consisting of three Mitsubishi Power Systems Americas (MPSA) 501DA combustion turbine generators (CTG), coupled with one steam turbine, and an air cooled condenser in a combined cycle configuration. Instead, the HBEP site could also be configured to contain 9 LMS100 simple-cycle combustion turbines producing about 956 MW, which is similar to CPV Sentinel, an 850-megawatt (MW) peaking facility recently approved by the Energy Commission. Each turbine can have an exhaust stack 13.5 feet in diameter and 90 feet tall. Auxiliary equipment may include a spray mist fogging system for cooling the inlet combustion air; a turbine intercooler; nine single-cell cooling towers, each with circulating water pumps. The size of each cooling tower can be 40 feet high, 42 feet wide and 42 feet long. While feasible and able to achieve most of the HBEP objectives, this alternative was eliminated from detailed consideration as it would not reduce or avoid any HBEP impacts, as discussed below.

    - *Air Quality*: Compared to a combined-cycle facility such as the proposed HBEP, simple-cycle turbines can achieve similar thermal efficiency. For example, the CPV Sentinel project has a net heat rate of 8,468 Btu/kWh under normal operation conditions with a full load efficiency of approximately 42 percent while the operating range of HBEP is estimated to be 8,800 to 8,140 Btu/kWh with efficiencies ranging from 38.8 percent to 41.9 percent. Although the permitted emission limits of specific projects may be different due to different BACT requirements, the criteria pollution emissions of simple-cycle and combined-cycle projects at this efficiency range are similar. In addition, the emissions of both combined-cycle and simple-cycle facilities would be offset and therefore have no adverse air quality impacts. In addition, an advanced simple-cycle combustion turbine, such as a LMS100, would also qualify for the ERC and offset exemption allowed in SCAQMD Rule 1304.

    - *Biological Resources*: Construction impacts to biological resources would likely be similar to HBEP. The primary significant impacts associated with operation of the proposed HBEP would be noise impacts to sensitive adjacent wildlife and habitats, avian collisions and electrocution, and degradation of adjacent habitats from storm water runoff. All of these impacts can be reduced to a less-than-significant level through implementation of staff's proposed conditions of certification. Impacts from storm water runoff would likely be comparable to the HBEP. This alternative is not expected to avoid any of the proposed project's impacts to biological resources, and even if some impacts are decreased in magnitude, staff's proposed conditions of certification for the HBEP would likely still be required to reduce impacts to less than significant.

    - *Land Use*: The simple-cycle combustion turbine scenario would be similar to the proposed HBEP in that both scenarios would replace the existing Huntington Beach Generation Station (HBGS), requiring the issuance of a conditional use permit and a coastal development permit by the city of Huntington Beach, but for the Energy Commission's exclusive authority to license the project. The simple-cycle combustion turbine scenario would differ compared to the proposed HBEP by not requiring the approval of a variance because if the equipment is similar to the CPV Sentinel project, then the only structure that would exceed the maximum height limit of 50 feet2 in the Public-Semipublic (PS) zoning district would be the 90 foot stacks (LW2008a). An exception to the height limits for the stack heights could be granted as part of the conditional use permit if public visual resources are preserved and enhanced where feasible. Compliance with all other development standards of the PS district appears to be achievable with this alternative.

- *Noise:* Construction of an industrial facility such as a power plant usually creates temporary or short-term noise impacts. Construction of the proposed combined cycle HBEP, however, would extend beyond what's considered "temporary," but the impacts would be less than significant with the implementation of the staff-proposed noise conditions of certification related to construction (see **NOISE AND VIBRATION** section in this document). The construction period for the simple cycle configuration would be similar to the proposed HBEP since the demolition phases of the existing units would still be needed. Also, construction equipment would be similar. Thus, the noise impacts would be similar.

  Operation of an industrial facility such as a power plant can create permanent or long-term noise impacts. Although different generating equipment would be employed for the simple cycle units, modern power plant equipment, whether for a simple cycle or a combined cycle plant, are acoustically designed per the manufacturer to meet local and state noise standards. Therefore, although the equipment would be different, the overall noise impacts at the projects nearest noise-sensitive receptors, approximately 1,000 feet away, would be similar.

  With implementation of conditions of certification similar to those proposed by staff in the **NOISE AND VIBRATION** section of this document, the simple cycle alternative would likely create a less-than-significant impact at adjacent noise-sensitive receptors.

- *Visual Resources*: To evaluate the comparative impacts on visual resources for this alternative, staff reviewed the visual analysis in the December 2010 Commission Decision on the CPV Sentinel Energy Project in Riverside County

[2] Section 230.72 Exceptions to Height Limits of the Huntington Beach Municipal Code allows for an additional 10 feet exceeding the maximum permitted height in which the site is located for chimneys, vent pipes, cooling towers, and similar structures and necessary mechanical appurtenances. Within the coastal zone exceptions to height limits may be granted only when public visual resources are preserved and enhanced where feasible.

(07-AFC-3), which uses the same technology as the Simple-Cycle Combustion Turbine Alternative being evaluated as an alternative to the proposed HBEP. For the Sentinel Energy Project, the power block structures are configured in a string of eight parallel units across the plant site.

Similar to the Sentinel Energy Project, this alternative would include the following visually prominent structures:

- A total of nine natural gas-fired simple-cycle combustion turbine generators (CTGs), each measuring approximately 130 feet long, 90 feet wide, and 40 feet high.
- Each of the nine CTGs would include an exhaust stack measuring approximately 13.5 feet in diameter and 90 feet high.
- Each of the nine CTGs would include a single-cell cooling tower measuring approximately 42 feet long, 42 feet wide, and 41 feet high.
- A raw water storage tank measuring approximately 110 feet in diameter and 64 feet high.
- A total of two treated water storage tanks measuring 70 feet in diameter and 36 feet high.
- Several steel monopole transmission structures measuring 85–115 feet tall.

By comparison, the proposed HBEP would involve construction of two power blocks, each with three HRSGs and stacks that would be 92 feet tall and 120 feet tall, respectively. The two ACC units would measure approximately 209 feet long, 127 feet wide, and 104 feet high. Other major structures would range from approximately 25 to 40 feet high. The steel monopole transmission structures would be similar to those constructed at the Sentinel Energy Project site.

The two power blocks for the proposed HBEP would group the tallest structures at the project site in two areas at opposite sides of the site. The major project structures for the Simple-Cycle Combustion Turbine Alternative would likely be arranged in a way that could increase the visual breadth of the project compared to the proposed HBEP. The visual effect of this alternative compared to the proposed project could be somewhat greater due to the probable increased clutter and density of power plant structures across the site. However, the reduced vertical profile of this alternative compared to the HBEP (90-foot-tall stacks compared to 120-foot-tall stacks) could slightly improve the effectiveness of measures to restore and enhance visual quality in the Coastal Zone, in accordance with the applicable provisions of the California Coastal Act, but without a site arrangement plan or preliminary concept for screening this alternative, it is unknown how visual screening measures would compare in their potential to reduce impacts.

The potential exists for visible plumes to form over the nine cooling towers. Given the coastal location of the Huntington Beach power plant, it is assumed that plume abated cooling towers would be required for this alternative. Visible plume abatement could be achieved with a wet/dry tower to mix unsaturated hot air with saturated hot air to create an unsaturated exhaust. Wet/dry cooling towers would significantly lower the potential for visible plume formation, but depending on the design and ambient conditions at the site, visible plumes could still form above the cooling towers. Implementation of mitigation measures could be required to reduce the potential size and frequency of visible plume formation to less than significant.

Staff's visual resources analysis for the proposed HBEP identifies significant impacts from constructing and operating the proposed HBEP that also apply to the Simple-Cycle Combustion Turbine Alternative. The overall impacts on visual resources under this alternative would be similar to HBEP.

RECYCLED WATER ALTERNATIVE

Staff considered a Recycled Water Alternative in the PSA. However, the use of recycled water as part of the proposed HBEP has been found infeasible. A further analysis of this determination is provided within the **SOIL AND WATER RESOURCES** section of this FSA.

ALTERNATIVES EVALUATED IN FULL DETAIL

Based on the analysis provided above in the subsection "Alternatives Eliminated from Detailed Consideration," the only alternative carried forward for detailed analysis and comparison against the HBEP is the No-Project Alternative. The environmental analysis discussions provided below compare the environmental effects of the No-Project Alternative to the HBEP. A brief description of the No-Project Alternative is provided. Following this overview, an environmental impact analysis is provided for the No-Project Alternative in detail. Where applicable, the analysis is focused on the No-Project Alternative's ability to avoid or lessen any significant HBEP impacts.

As shown in **Alternatives Table 1**, the HBEP results in potentially significant unavoidable Visual Resources impacts (at Key Observation Points 4 and 5). Pursuant to CEQA, when developing alternatives and evaluating them, all significant project impacts were considered and evaluated for each alternative's ability to lessen or avoid any HBEP-related impacts.

Alternatives Table 1
Comparison of HBEP and Alternatives

Issue Area	HBEP[1]	No-Project Alternative[2]	
		Air Cooled Condenser Retrofit	**Wet Cooling Retrofit**
Air Quality			
Construction-related emissions	SM	Less Than HBEP (SM)	Less Than HBEP (SM)
Project operations emissions	SM	Less Than HBEP (SM)	Less Than HBEP (SM)
Biological Resources			
Construction			
Native vegetation	LS	Similar to HBEP (LS)	Greater than HBEP (SM)
Common wildlife	SM	Similar to HBEP (SM)	Greater than HBEP (SM)
Special-status plants	SM	Similar to HBEP (SM)	Greater than HBEP (SM)
Special-status wildlife	Noise: SM Lighting, Weeds, Stormwater, Groundwater: SM	Noise: Less than HBEP (SM) Lighting, Weeds, Stormwater, Groundwater: Similar to HBEP (SM)	Noise: Less than HBEP (SM) Lighting, Weeds, Stormwater, Groundwater: Similar to HBEP (SM)
Jurisdictional wetlands and waters	SM	Similar to HBEP (SM)	Greater than HBEP (SM)
Noise	SM	Less than HBEP (SM)	Less than HBEP (SM)
Lighting	SM	Similar to HBEP (SM)	Similar to HBEP (SM)
Dust	SM	Similar to HBEP (SM)	Similar to HBEP (SM)
Invasive weeds	SM	Similar to HBEP (SM)	Similar to HBEP (SM)
Stormwater runoff	SM	Similar to HBEP (SM)	Similar to HBEP (SM)
Groundwater contamination	SM	Similar to HBEP (SM)	Similar to HBEP (SM)
Operation			
Noise	At marshes: LS At Wildlife Care Center: LS	Less than HBEP (LS)	Less than HBEP (LS)
Lighting	LS	Similar to HBEP (LS)	Similar to HBEP (LS)
Avian collision and electrocution	SM	Similar to HBEP (SM)	Similar to HBEP (SM)
Stormwater runoff	SM	Similar to HBEP (SM)	Similar to HBEP (SM)
Nitrogen deposition	LS	Less than HBEP (LS)	Less than HBEP (LS)
Cultural Resources			
Potential impacts from construction: archaeological resources	PSM	Less than HBEP (PSM)	Greater than HBEP (SM)
Potential impacts from construction: ethnographic resources	—	Similar to HBEP (—)	Similar to HBEP (—)
Potential impacts from construction: built environment resources	—	Similar to HBEP (—)	Greater than HBEP (—)
Potential impacts from operation: archaeological resources	LS	Similar to HBEP	Similar to HBEP
Potential impacts from operation: ethnographic resources	—	Similar to HBEP (—)	Similar to HBEP (—)
Potential impacts from operation: built environment resources	—	Similar to HBEP (—)	Similar to HBEP (—)

Issue Area	HBEP[1]	No-Project Alternative[2]	
		Air Cooled Condenser Retrofit	Wet Cooling Retrofit
Geology and Paleontology			
Risk of strong seismic shaking	PSM	Similar to HBEP (PSM)	Similar to HBEP (PSM)
Risk of liquefaction resulting from strong seismic shaking.	PSM	Similar to HBEP (PSM)	Similar to HBEP (PSM)
Risk of potential excessive settlement due to dynamic compaction resulting from strong seismic shaking.	PSM	Similar to HBEP (PSM)	Similar to HBEP (PSM)
Risk of surface fault rupture	LS	Similar to HBEP	Greater than HBEP
Risk of inundation by tsunami resulting from distant underwater earthquake of local submarine landslide	LS	Similar to HBEP	Similar to HBEP
Hazardous Materials			
Risk of fire or explosion impact off-site resulting from natural gas usage during operations	PSM	Similar to HBEP (PSM)	Similar to HBEP (PSM)
Risk of hazardous material spill impact en route (off-site) resulting from hazardous materials transportation to site	PSM	Similar to HBEP (PSM)	Similar to HBEP (PSM)
Risk of hazardous material spill / migration impact off-site resulting from hazardous materials storage and use on-site shaking	PSM	Similar to HBEP (PSM)	Similar to HBEP (PSM)
Risk of significant drawdown of emergency response services causing impact off-site	LS	Similar to HBEP	Similar to HBEP
Land Use			
Exceed maximum allowable height limit of Public Semi-Public zoning district.	PSM	Similar to HBEP (PSM)	Similar to HBEP (PSM)
Noise and Vibration			
Construction	LS	Less Than HBEP (LS)	Less Than HBEP (LS)
Operation	LS	Greater than HBEP (PSM)	Greater than HBEP (PSM)
Public Health			
Construction-related diesel particulate matter	LS	Less Than HBEP (LS)	Less Than HBEP (LS)

Issue Area	HBEP[1]	No-Project Alternative[2]	
		Air Cooled Condenser Retrofit	Wet Cooling Retrofit
emissions			
Operation-related toxic air contaminants/ emissions	LS	Less Than HBEP (LS)	Less Than HBEP (LS)
Operation-related Legionella	—	Same as HBEP (—)	Greater Than HBEP (—)
Socioeconomics			
Environmental justice population within six-mile buffer.	No	No	No
Induce substantial population growth in an area, either directly or indirectly	LS	Slightly less than HBEP (LS)	Less than HBEP (LS)
Displace substantial numbers of people and/or existing housing, necessitating the construction of replacement housing elsewhere	LS	Slightly less than HBEP (LS)	Less than HBEP (LS)
Adversely impact acceptable levels of service for police protection, schools, and parks and recreation.	LS	Slightly less than HBEP (LS)	Less than HBEP (LS)
Increased property taxes, construction and operation employment income, and increased state and local taxes and fees	B	Slightly less than HBEP (B)	Less than HBEP (B)
Soil and Water Resources			
Soil erosion by wind and water or water quality impacts during project construction	PSM	Similar to HBEP (PSM)	Similar to HBEP (PSM)
Soil erosion by wind and water or water quality impacts during project operation	PSM	Similar to HBEP (PSM)	Similar to HBEP (PSM)
Water quality impacts from power plant operations	B	Similar to HBEP (B)	Similar to HBEP (B)
Water quality impacts from sanitary waste	—	Same as HBEP (—)	Same as HBEP (—)
Potential impacts from on-site and off-site flooding	—	Same as HBEP (—)	Same as HBEP (—)
Potential to impede or redirect 100-year flood flows, as shown on	—	Same as HBEP (—)	Same as HBEP (—)

Issue Area	HBEP[1]	No-Project Alternative[2]	
		Air Cooled Condenser Retrofit	Wet Cooling Retrofit
Federal Emergency Management Agency maps			
Water Supply			
Potential impacts on local wells	B	Similar to HBEP (B)	Similar to HBEP (B)
Potential impacts on local water supply	B	Similar to HBEP (B)	Similar to HBEP (B)
Traffic & Transportation			
Cause an increase in traffic	LS	Less than HBEP (LS)	Greater than HBEP (PSM)
Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system	LS	Less than HBEP (LS)	Greater than HBEP (PSM)
Conflict with an applicable congestion management program	LS	Less than HBEP (LS)	Greater than HBEP (PSM)
Substantially increase hazards	-	Less than HBEP (—)	Greater than HBEP (PSM)
Result in inadequate emergency access	-	Less than HBEP (—)	Greater than HBEP (PSM)
Conflict with adopted policies, plans, or programs regarding alternative transportation	-	Similar to HBEP (—)	Similar to HBEP (—)
Result in a change in air traffic safety risk (stacks)	LS	Similar to HBEP	Similar to HBEP
Produce a thermal plume in an area where flight paths are expected to occur below 1,000 feet from the ground	PSM	Similar to HBEP (PSM)	Similar to HBEP (PSM)
Result in cumulative traffic effects	LS	Similar to HBEP (LS)	Similar to HBEP (LS)
Transmission Line Safety and Nuisance			
Impacts from generated fields	LS	Less than HBEP (LS)	Less than HBEP (LS)
Nonfield impacts from operations	LS	Less than HBEP (LS)	Less than HBEP (LS)
Visual Resources			
Impact at key observation point (KOP) 4	PSM	Similar to HBEP (PSM)	Similar to HBEP (PSM)
Impact at KOP 5	SM	Somewhat less than HBEP (PSM)	Somewhat less than HBEP (PSM)
Construction-related effects	SM	Less than HBEP (PSM)	Less than HBEP (PSM)
Project construction	SM	Less than HBEP (PSM)	Less than HBEP (PSM)

Issue Area	HBEP[1]	No-Project Alternative[2]	
		Air Cooled Condenser Retrofit	Wet Cooling Retrofit
lighting			
Project operations lighting	SM	Similar to HBEP (SM)	Similar to HBEP (LS)
Potential daytime glint or glare from project structures	SM	Similar to HBEP LS)	Similar to HBEP (LS)
Waste Management			
Potential for Material/waste generated during the construction and operation to not be managed in an environmentally safe manner, i.e. recycling or disposal	PSM	Similar to HBEP (PSM)	Similar to HBEP (PSM)
Potential for disposal or diversion of project materials to cause impacts on existing waste disposal or diversion facilities	PSM	Less than HBEP (PSM)	Similar to HBEP (PSM)
Potential for impacts on human health and the environment related to past or present soil or water contamination	PSM	Similar to HBEP (PSM)	Similar to HBEP (PSM)
Worker Safety & Fire Protection			
Risk of fire or explosion impact off-site resulting from natural gas usage during construction	PSM	Similar to HBEP (PSM)	Similar to HBEP (PSM)
Risk of significant drawdown of emergency response services causing impact off-site	LS	Similar to HBEP (LS)	Similar to HBEP (LS)

Notes:
1 The following correspond to impact determinations of the HBEP, as provided within each environmental analysis section of this FSA:
— = no impact
UNK = significance of impact is unknown
B = beneficial impact
LS = less than significant impact, no mitigation required
SM or PSM = significant or potentially significant impact that can be mitigated to less than significant
SU or PSU = significant and unavoidable or potentially significant and unavoidable impact that cannot be mitigated to less than significant
2 This summary is comparative in nature, and corresponds to impact of the Alternative when compared to the HBEP, as discussed within subsection "Alternatives Evaluated in Detail."

The CEQA Guidelines state that “the purpose of describing and analyzing a “no project” alternative is to allow decision makers to compare the impacts of approving the proposed project with the impacts of not approving the proposed project” (Cal. Code Regs., tit. 14, § 15126.6(i)). Toward that end, the “no project” analysis considers “existing conditions” and “what would be reasonably expected to occur in the foreseeable future if the project were not approved…” (§ 15126.6(e)(2)). The No-Project Alternative (i.e., the retrofit scenarios discussed below) provides a baseline against which the effects of the proposed action may be compared.

The No-Project Alternative for the HBEP is not a traditional “no build” alternative, which is often the case under CEQA. Alternatives staff consulted with AES (current operator of the HBGS) to assess the likelihood of the HBGS being retired absent the HBEP. Staff concluded it unlikely that the HBGS would be permanently retired, due to the fact that continued electrical generation from the HBGS would be required (absent the HBEP) to ensure grid stability and serve electricity demand.

Therefore, staff concludes the No-Project Alternative would require existing HBGS Units 1 and 2 to be retrofitted to comply with SWQCB’s OTC policy to allow for continued operation of the HBGS. This alternative is described and analyzed below. Staff acknowledges that cost and economics (e.g., rate of return) of retrofitting HBGS Units 1 and 2 is a business decision that would have to be considered by the applicant.

Under a No-Project Alternative retrofit scenario, the HBGS would need to employ some other means to comply with the SWRCB’s OTC Policy to keep the facility online. Currently, HBGS Units 1 and 2 are used for electrical production, while Units 3 and 4 are used as synchronized condensers providing voltage support to the electrical grid. Through coordination with the applicant and Engineering staff, two retrofit scenarios are likely for continued long-term use of HBGS Units 1 and 2 absent the proposed HBEP:

1. Retrofit HBGS Units 1 and 2 to become air cooled via use of air cooled condensers. After such a retrofit, HBGS Units 1 and 2 would operate similar to the proposed HBEP technology, but would only provide two power blocks that would produce slightly less than half the energy that would be generated by the HBEP.

2. Keep HBGS Units 1 and 2 as wet cooled, but retrofit the power blocks for use of another cooling water source (other than ocean water). Under this retrofit scenario, the HBGS would continue operation as a wet cooled facility.

These two retrofit scenarios are described below.

No Project (Retrofit) Alternative Scenarios

The following identifies the two No-Project Alternative retrofit scenarios considered feasible by staff for complying with the SWRCB’s OTC policy:

- Retrofit Air Cooled Condenser Scenario: This scenario would continue operation of HBGS Units 1 and 2 (430MW) as steam boilers and Units 3 and 4 as synchronized condensers, with the requirement that HBGS Units 1 and 2 be retrofitted with an air-cooled condenser. The retrofit activities would involve reconfiguring the existing plant and installing air-cooling infrastructure similar to that of the HBEP, but at HBGS Units 1 and 2 only. Engineering staff estimate the retrofit air cooled condenser used with HBGS Units 1 and 2 would be about 43 percent larger than what is proposed for HBEP, but could fit where the HBEP generating block 1 is being proposed (refer to Project Description).

Under this retrofit scenario, the generating station would operate slightly less efficiently than the proposed HBEP, the existing HBGS, and the No-Project Alternative wet cooled scenario for the following reasons:

- Retrofitting the existing boilers for air-cooling is not as efficient as the proposed HBEP system; and
- Wet cooling is inherently more efficient than dry cooling.

- Wet Cooling Scenario: This scenario would continue operation of HBGS Units 1 and 2 (430MW) as steam boilers and Units 3 and 4 as synchronized condensers, with the requirement that HBGS Units 1 and 2 utilize a non-ocean water source for cooling. For the wet cooling retrofit scenario, the following water sources have been eliminated from consideration by staff:
  - *Continued Use of Ocean Water to Meet OTC Policy (90 percent improvement in impingement and entrainment)*. Staff acknowledges that the OTC Policy includes a mechanism to adjust compliance schedules for OTC facilities, if the energy agencies request such delays. An adjustment in the schedule for decreasing OTC water use by the HBGS could be implemented for purposes of maintaining grid reliability, but it would not be a long-term solution. Therefore, for purposes of the No-Project Alternative, staff evaluated a permanent retrofit allowing long-term operation of the HBGS. Staff does not consider use of seawater for cooling as a long-term viable alternative because one of the main objectives of the HBEP is compliance with SWRCB's policy to eliminate use of seawater.
  - *Use of Potable Water to Meet OTC Policy*. The applicant identified a No-Project Alternative retrofit scenario utilizing a potable water source (HBEP 2012a, p. 6-4). Wet cooling, using fresh or potable water, is discouraged by SWRCB and Energy Commission policies related to water consumption of a facility. While the HBEP would utilize potable water for industrial processes (e.g., evaporative cooling blowdown makeup) and no significant impacts have been identified from this use, staff has eliminated the use of fresh or potable water as a retrofit option for cooling from further consideration to comply with SWRCB and Energy Commission policies and because it would require substantially more water than HBEP.

The use of recycled water for the proposed HBEP has been eliminated by Water Resources staff because the volume of potable water used for dry cooling would be minimal and would not warrant the environmental impacts and costs associated with construction of a pipeline to the site. However, the use of recycled water under the

No-Project Alternative wet cooled retrofit would is considered by staff because wet cooling technology would use substantially more water than dry cooling technology and the volume of water used for this alternative would necessitate using recycled water. Therefore, the use of recycled water is included under a No-Project Alternative wet cooling retrofit scenario. In addition, a recycled water source has been identified proximate to the HBGS site.

Both the applicant and Water Resources staff have acknowledged the use of recycled water as part of a wet cooled retrofit for the HBGS is the most likely way to make such a scenario possible. Descriptions of the activities and components necessary for this retrofit scenario, which would utilize recycled water as a cooling water source for HBGS Units 1 and 2, are provided below (HBEP 2013ii).

- *Recycled Water Source*: This scenario would use recycled water for the makeup cooling water source. Such water is currently not delivered to the existing HBGS site. Recycled water is potentially available to the HBGS from a combination of the following two Orange County Sanitation District's (OCSD) facilities (assumed to be an adequate long-term reliable recycled water source), which are connected by an interplant pipeline:
    - OCSD Huntington Beach Plant #1 is located 2.5 miles northeast of the HBEP site at the intersection of Ellis Avenue and Ward Street. A portion of the secondary water flow from OCSD Plant #1 goes to the Orange County Water District (OCWD) for use in the District's groundwater replenishment program.
    - OCSD Huntington Beach Plant #2 is located 1.1 miles east-southeast of the HBEP site, south of Hamilton Avenue between Brookhurst Street and the adjacent Santa Ana River. OCSD Plant #2 is closer to the HBGS and all secondary effluent is currently discharged to the ocean. This alternative could utilize only this Plant #2 secondary effluent discharge (per pipeline route 2 identified below).
- *Recycled Water Pipeline*: Delivery of recycled water from these two OCSD facilities would require construction of a 3-mile and 6-inch diameter pipeline to the HBGS site via a public right-of-way. After the publication of the PSA, staff learned that alignments studied by the applicant and those suggested by staff in PSA Part B would not be feasible, as the City of Huntington Beach indicated there are not adequate rights-of-way in city streets to accommodate additional utilities.
- *Required Water Treatment Facility*: Treatment of the recycled water from OCSD to Title 22 tertiary standards would be required prior to use in the wet cooling tower system. Therefore, a water treatment facility would be constructed at the existing HBGS. The footprint for the treatment facility, based on water need for

430 MW, is approximately 13,000 square feet; the height is approximately 23 feet, based on a five million gallon per day (MGD) facility that would include filtration and disinfection. There would be an equalization/storage tank to ensure an adequate supply of tertiary treated water to meet peak demands of this No-Project Alternative scenario at HBGS. This is not included in the footprint estimate. It is assumed the equalization/storage tank could, however, be combined with the chlorine contact tank to optimize the overall footprint.

For the purposes of this No-Project Alternative scenario, it is assumed the necessary tertiary water treatment facility would be sited within the HBGS. This is to ensure the feasibility of both pipeline route alternatives by having the treatment facility downstream at HBGS. Such a facility could require up to 13,000 square feet. The feasible available location for a water treatment facility is within the central portion of the HBGS site, southeast of the on-site SCE switchyard. Staff acknowledges that siting constraints of such a facility exist and construction of a water treatment facility at this location would require the demolition of various support building and facilities. However, for purposes of this analysis, staff assumes feasibility of siting this facility within the HBGS as part of the overall retrofit design.

- *Construction of a New On-Site Cooling Tower:* To utilize this new wet cooling technology for HBGS Units 1 and 2, a wet cooling tower would be required at HBGS. An initial estimate indicates the wet cooling tower would have approximate dimensions of 60 feet wide by 650 feet long (approximately 38,880 square feet) and 50 feet high. Given the coastal location of HBGS, it is assumed a plume-abated cooling tower would also be required. The size of this cooling tower is currently unknown to staff. The only available location for these cooling towers is within the central portion of the HBGS site, southeast of the on-site SCE switchyard. Construction of the wet cooling towers at this location would result in the demolition of various support building and facilities.

In terms of operational efficiency, under this retrofit scenario (i.e., wet cooling), the generating station would operate slightly less efficiently than the proposed HBEP and the No-Project Alternative air cooled scenario, and similar to the existing HBGS.

No Project (Retrofit) Alternatives Consistency with HBEP Objectives

Alternatives Table 2 provides a summary of each No-Project Alternative scenario's ability to fulfill the HBEP objectives. As shown in **Alternatives Table 2**, the Dry Cooling Retrofit scenario would meet half of the HBEP objectives and partially meet one more objective. The Wet Cooling Retrofit Scenario would meet two HBEP objectives and partially meet two other objectives. Neither retrofit alternative would meet the HBEP's objectives of providing efficient, reliable and flexible generation.

Alternatives Table 2
Summary Comparison of No-Project Alternative Scenarios to HBEP Objectives

	No-Project Alternative – Dry Cooling	No-Project Alternative – Wet

HBEP Objective	Retrofit Scenario	Cooling Retrofit Scenario
Provide efficient, reliable and predictable power supply by using combined-cycle, natural gas-fired combustion turbines to replace the OTC generation.	No. Under the No-Project Alternative, improvements to the existing HBGS would be made to comply with SWRCB's OTC Policy. However, the retrofit designs associated with the No-Project Alternative are not found to be the most efficient, reliable, or predictable use of the existing HBGS. Furthermore, Engineering staff finds that retrofitting the existing boilers for air-cooling is not as efficient as the proposed HBEP system.	No. Under the No-Project Alternative, improvements to the existing HBGS would be made to comply with SWRCB's OTC Policy. However, Engineering staff finds that installation of wet cooling towers would slightly decrease the existing HBGS's efficiency and increase particulate matter (PM) emissions when compared to the HBEP.
Support the local capacity requirements of Southern California's Western Los Angeles Basin.	Partially. While this retrofit scenario would allow for the HBGS to continue producing 436 MW of electricity in a similar operational capacity it currently provides, this alternative would not provide as much generation to the CAISO Western Los Angeles Local Reliability Subarea as the HBEP (939 MW).	Partially. While this retrofit scenario would allow for the HBGS to continue producing 436 MW of electricity, this alternative would not provide as much generation to the CAISO Western Los Angeles Local Reliability Subarea as the HBEP (939 MW).
Develop a 939 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.	No. This retrofit scenario would only allow for the HBGS to continue producing 436 MW, which does not allow fast ramping or fast starting capability. Furthermore, Engineering staff finds that retrofitting the existing boilers for air-cooling is not as efficient as the proposed HBEP system.	No. This retrofit scenario would only allow for the HBGS to continue producing 436 MW, which does not allow fast ramping or fast starting capability. Furthermore, Engineering staff finds that installation of wet cooling towers would slightly decrease the existing HBGS's efficiency when compared to the HBEP.
Reuse existing electrical, water, wastewater, and natural gas infrastructures and land to minimize terrestrial resource and environmental justice impacts by developing on an existing brown field site.	Yes. Under this No-Project Alternative retrofit scenario, improvements to the existing HBGS would be made to comply with SWRCB's OTC Policy. These improvements would utilize the existing electrical, water, wastewater, and natural gas infrastructures and land serving the HBGS.	Partially. Under this No-Project Alternative retrofit scenario, improvements to the existing HBGS would be made to comply with SWRCB's OTC Policy. These improvements would utilize the existing electrical, water, wastewater, and natural gas infrastructures and land serving the HBGS. A new pipeline would be required to deliver water to the site.
Site the project to serve the load area without constructing new transmission facilities.	Yes. Under this No-Project Alternative retrofit scenario, improvements to the existing HBGS would be made to comply with SWRCB's OTC Policy. These improvements would utilize the existing transmission infrastructure serving the HBGS. However, this retrofit scenario would only allow for the HBGS to continue producing 436 MW of electricity in a similar operational capacity it currently provides to the CAISO Western Los Angeles Local Reliability Subarea.	Yes. Under this No-Project Alternative retrofit scenario, improvements to the existing HBGS would be made to comply with SWRCB's OTC Policy. These improvements would utilize the existing transmission infrastructure serving the HBGS. However, this retrofit scenario would only allow for the HBGS to continue producing 436 MW of electricity in a similar operational capacity it currently provides to the CAISO Western Los Angeles Local Reliability Subarea.
Site the project on property that has industrial land use designation with consistent zoning.	Yes. Under the No-Project Alternative, improvements to the existing HBGS would be made to comply with SWQCB's OTC Policy. These improvements would be	Yes. Under the No-Project Alternative, improvements to the existing HBGS would be made to comply with SWQCB's OTC Policy. These

HBEP Objective	No-Project Alternative – Dry Cooling Retrofit Scenario	No-Project Alternative – Wet Cooling Retrofit Scenario
	made to the existing HBGS, which is currently designated and zoned as an electrical generation industrial facility.	improvements would be made to the existing HBGS, which is currently designated and zoned as an electrical generation industrial facility.

Environmental Analysis

Alternatives Table 1 provides a summary comparison of the HBEP environmental impacts and those of the No-Project Alternative retrofit scenarios. Based upon staff's analysis, the No-Project Alternative retrofit scenarios impacts are similar to or less than those of the HBEP. The following discussion provides a detailed issue area analysis of the No-Project Alternative retrofit scenarios.

Air Quality

Background

The installation of wet cooling towers would decrease the efficiency of Units 1 and 2 as well as increase their particulate matter (PM) emissions. Similar to wet cooling technology, use of an air-cooled condenser to cool these two units would also decrease their efficiency. In addition, installation of an air-cooled condenser may require more site space, auxiliary loads, and capital cost than retrofitting with wet cooling towers. Units 3 and 4 would continue to be operated as synchronous condensers. These units do not cause any onsite air pollutant emissions, although they would consume small amounts of electricity to keep them spinning.

When comparing air quality emission impacts of the No-Project Alternative retrofit scenarios against the HBEP, Air Quality staff assumes that under either alternative, Units 1 and 2 would continue to operate, but would be cooled with either an air-cooled condenser or a wet cooling tower. Under either alternative staff assumes that these two units would have annual usage rates similar to what they had during last two years. In 2011, Unit 1 operated for 1,205 hours and Unit 2 operated for 1,300 hours. In 2012, Unit 1 operated for 1,153 hours and Unit 2 operated for 2,496 hours (Air Quality staff derived from QFER CEC-1304 Power Plant Owner Reporting Database). By comparison, HBEP is expected to operate up to 6,835 hours per year.

Retrofit Air Cooled Condenser Scenario

To compare emissions, air quality staff reviewed the HBGS emission data in the SCAQMD Annual Emission Reporting Program and compared emissions for Units 1 and 2 to estimated emissions for the proposed HBEP. Air Quality staff has determined the proposed HBEP would have much higher emissions than the No-Project Alternative air cooled retrofit scenario because the HBEP would have more generators operating more hours in any given day/week/year. The No-Project Alternative air cooled retrofit scenario would only continue operation of existing HGBS Units 1 and 2. Therefore, the decrease in pollutant emissions under the No-Project Alternative air cooled retrofit scenario is due to a decrease in operational hours when compared to the HBEP. Therefore, the No-Project Alternative air cooled retrofit scenario would be less than those of the proposed HBEP. Regardless, emissions from both scenarios would be mitigated to a level of less than significant.

Retrofit Wet Cooling Scenario

To compare emissions, air quality staff reviewed the HBGS emission data in SCAQMD's Annual Emission Reporting Program and compared emissions for Units 1 and 2 to estimated emissions for the proposed HBEP. Air Quality staff has determined the proposed HBEP would have much higher emissions than the No-Project Alternative wet cooled retrofit scenario because the HBEP would have more generators operating more hours in any given day/week/year. The No-Project Alternative wet cooled retrofit scenario would only continue operation of existing HGBS Units 1 and 2. The decrease in pollutant emissions under the No-Project Alternative wet cooled retrofit scenario is due to a decrease in operational hours when compared to the HBEP. Therefore, the No-Project Alternative wet cooled retrofit scenario would be less than those of the proposed HBEP. Regardless, emissions from both scenarios would be mitigated to a level of less than significant.

Biological Resources

Retrofit Air Cooled Condenser Scenario

This No-Project Alternative scenario would be constructed within previously disturbed areas. Therefore, construction impacts would be mostly similar to those of the proposed project. However, noise impacts to sensitive wildlife from the air cooled condenser retrofit scenario of the No-Project Alternative are expected to be less than the proposed HBEP because the construction duration would be substantially shorter.

Retrofit Wet Cooling Scenario

This No-Project Alternative scenario would be constructed in previously disturbed areas with the exception of a water pipeline that would be routed along the Santa Ana River. The Santa Ana River and proximate floodplain support native riparian vegetation, including southern cottonwood willow riparian forest, which is a sensitive vegetation community as designated by the California Department of Fish and Wildlife (CDFW 2013). The river and adjacent habitat also potentially support special-status plants and wildlife (CDFW 2013) and are designated jurisdictional waters of the U.S and/or state. Ground disturbance along the Santa Ana River during construction of the pipeline would result in greater impacts to native vegetation, common wildlife, special-status plants, and jurisdictional wetlands and waters than the proposed project. However, noise impacts to sensitive wildlife would be less than the proposed project because the construction duration would be substantially shorter.

Cultural Resources

Retrofit Air Cooled Condenser Scenario

This scenario involves upgrades to equipment at HBGS Units 1 and 2, construction of an air cooled condenser tower in the vicinity of the proposed HBEP Block 1, and installation of pipelines between the condenser tower and HBGS Units 1 and 2. All such construction would take place within the existing HBGS site and require depths of excavation similar to the proposed HBEP, as analyzed in the Cultural Resources section of this FSA. However, replacing the current cooling system would concentrate the majority of project impacts to machinery already built. Therefore, staff expects that the potential to damage buried archaeological resources or human remains would be reduced from the degree of impact under the HBEP.

The HBGS is listed on a local register of historic resources and therefore might qualify as a historical resource for the purposes of the CEQA §15064.5[a][2]. Based on the preponderance of evidence that the HBGS is not a historical resource under CEQA as discussed in the **CULTURAL RESOURCES** section of the FSA, staff recommends that the Presiding Member and Energy Commission make a determination of ineligibility for listing on the CRHR or local register. Staff concludes that the impacts of this retrofit scenario would be similar to those of the proposed project as there would be no impacts to the historic built environment resources.

Retrofit Wet Cooling Scenario

Construction of the on-site portion of recycled water pipeline, water treatment facility, and cooling tower would take place on the existing project site and would require depths of excavation similar to the proposed project, as analyzed in the **CULTURAL RESOURCES** section of this FSA. Staff expects that potential impacts on buried archaeological resources of this retrofit scenario would be similar to those of the proposed HBEP.

The wet cooling scenario would add a recycled water pipeline along an off-site route, which would not be required for the HBEP as proposed.

Communication between staff and the applicant included a general description of potential pipeline routes (HBEP 2013ii). The applicant's records search for the proposed HBEP covers a portion of the area between the HBGS and the OCSD recycled water source. The records search results indicate that at least eight previous cultural resource studies have been conducted along potential pipeline routes (Ahlering 1973; Bonner 2007; Brown and Maxon 2010; Demcak 1999; Duke 2000; Hoover 2000; Lapin 2000; Mason and Chandler 2003). Because a feasible route has not been surveyed, staff does not have specific information about cultural resources that might be impacted by the construction of a pipeline. However, the addition of a pipeline route would add to the potential for impacts. Therefore, the No-Project Alternative wet cooling retrofit scenario would result in greater impacts on cultural resources compared to the HBEP.

Neither the applicant nor staff has identified any built environment resources of historic age within potential pipeline routes. However, as noted above, staff has incomplete data from which to draw conclusions. A windshield survey conducted by built environment staff on February 24, 2014, did not reveal any preliminary concerns about the potential for such a pipeline to impact built environment resources. Without the benefit of additional survey information about potential routes and the precise locations of the pipeline, however, staff must assume there is minor potential for impacts to built environment resources to occur. Such impacts would most likely occur at bridge crossings, where attaching a pipeline to a CRHR-eligible historic bridge could constitute an impact under CEQA. Impacts of this kind could be avoided by designing bridge crossings to cross waterways by jack-and-bore techniques or horizontal directional drilling instead of attaching the water pipeline directly to bridges. Since, it is likely that potential impacts on the historic built environment could be mitigated to a less-than-significant level, staff makes a recommendation that the impacts are similar to the HBEP.

Geology and Paleontology

Retrofit Air Cooled Condenser Scenario

There are no geologic resources that would be impacted in the areas where the air cooled condenser would be constructed. This facility can also be designed and constructed such that geologic hazards are not a concern similar to HBEP. Paleontological resources may be encountered in excavations that exceed 11 feet, but impacts can be mitigated similar to the HBEP. Thus, impacts to or from this No-Project Alternative scenario would be similar to the proposed HBEP.

Retrofit Wet Cooling Scenario

This scenario would continue operation of HBGS Units 1 and 2 (430 MW) as steam boilers and Units 3 and 4 as synchronized condensers. However, this alternative would require operation of HBGS Units 1 and 2 to utilize a new non-seawater water source for power plant cooling. The only feasible source of non-sea water for power plant cooling is non potable recycled waste water. The recycled wastewater would be generated at the Orange County Sanitation District Plant #2 and piped to HBEP. This No Project Alternative would require construction of a pipeline from the wastewater treatment facility, construction of a new on site water treatment facility, and construction of a new cooling tower. The pipelines would be constructed in a developed area that has already largely been disturbed. The alignment of the recycled water pipeline traverses potentially active traces of the Newport-Inglewood fault. Should surface rupture occur along those traces of the potentially active fault, the conveyance of recycled water to the HBEP would be disrupted. Without an adequate source of cooling water, the operation of the power plant may be jeopardized. The net effect to the Recycled Water Alternative from surface fault rupture would be greater than the proposed HBEP, unless the existing potable water supply is maintained as a backup supply. All other seismic related impacts would be the same as the proposed HBEP.

There are no geologic or mineralogical resources that would be impacted in the areas where the pipelines, cooling tower, and water treatment facility would be constructed. These facilities can also be designed and constructed such that geologic hazards are not a concern, similar to HBEP. Paleontological resources may be encountered in excavations that exceed 11 feet but impacts can be mitigated similar to the HBEP. Impacts from this No Project alternative would be similar to the proposed HBEP.

Hazardous Materials

Retrofit Air Cooled Condenser Scenario

As the use of hazardous materials at the proposed HBEP would have no significant impacts off-site, there would be no significant impact on the public resulting from their storage and use. The air cooled retrofit alternative would present a nearly identical hazardous materials risk profile as the HBEP. Both would use natural gas as fuel, use ammonia for selective-catalytic reduction of oxides of nitrogen in combustion exhaust, and have a closed-loop cooling water circuit with its associated water quality maintenance chemicals. Impacts from this No-Project Alternative scenario would be similar to those of the proposed HBEP.

Retrofit Wet Cooling Scenario

This wet cooling retrofit scenario would also present a nearly identical hazardous materials risk profile as the proposed HBEP. Both would use natural gas fuel, use ammonia for selective-catalytic reduction of oxides of nitrogen in combustion exhaust, and have a cooling water circuit. In this case, the cooling water circuit passes through an open-to-air cooling tower, and would include some biocides in its maintenance chemistry. Still there would be negligible potential for offsite impact. Impacts from this No-Project Alternative scenario would be similar to those of the proposed HBEP.

Land Use

Retrofit Air Cooled Condenser Scenario

This retrofit scenario would differ compared to the proposed HBEP by continuing the use of the existing HBGS Units 1-4 with 200-foot tall stacks rather than demolishing them to construct the HBEP Blocks 1 and 2 with 120-foot tall stacks, and by installing a 104-foot tall air cooled condenser that would be the same height as the air cooled condenser proposed for HBEP. The HBGS Units 1-4 are legal non-conforming structures which would remain in use and would not be required to be brought into compliance with the 50-foot maximum height limit of the Public-Semipublic (PS) zoning district. The air cooled condenser would be a new structure, which would exceed the maximum allowable height limit of the PS zone. Similar to the HBEP, this alternative would require the approval of a height variance. Compliance with all other development standards of the PS district appears to be achievable with this alternative. Impacts from this No-Project Alternative scenario would be similar to the proposed HBEP.

Retrofit Wet Cooling Scenario

The wet cooling scenario would differ compared to the proposed HBEP by continuing the use of the existing HBGS Units 1 and 2 with 200-foot tall stacks rather than demolishing them to construct the HBEP Blocks 1 and 2 with 120-foot tall stacks, and by constructing a 23-foot tall water treatment facility and a 50-foot tall on-site wet cooling tower. HBGS Units 1-4 are legal non-conforming structures which would remain in use and would not be required to be brought into compliance with the 50-foot maximum height limit of the PS zoning district. The estimated heights of the new water treatment facility and wet cooling tower would be within the 50-foot maximum height limit of the PS district and would not require a height variance, whereas the HBEP would require a height variance for the new power blocks and air cooled condenser. Compliance with all other development standards of the PS district appears to be achievable with this alternative. Impacts from this No-Project Alternative scenario would be similar to the proposed HBEP.

Noise and Vibration

Retrofit Air Cooled Condenser Scenario

Construction of an industrial facility such as a power plant usually creates temporary or short-term noise impacts. Construction of the proposed HBEP, however, would extend beyond what is considered "temporary", but the impacts would be less than significant with the implementation of the staff-proposed noise conditions of certification related to construction. The construction period for this scenario, however, would not be as extensive as the proposed HBEP because the demolition phases would be greatly reduced.

Operation of an industrial facility such as a power plant can create permanent or long-term noise impacts. The primary noise sources of the proposed HBEP are the power blocks, where the steam turbine generators, air-cooled condensers, and various pumps and fans would be located. The proposed HBEP would employ modern turbines and other machinery which would generate less noise than the boilers of the existing project. Therefore, the noise impact of this No-Project Alternative scenario would be more than the proposed HBEP. However, with implementation of conditions of certification similar to those proposed by staff in the **NOISE AND VIBRATION** section of this FSA, the No-Project dry cooling scenario would likely create a less-than-significant impact at adjacent noise-sensitive receptors.

Retrofit Wet Cooling Scenario

Construction of this alternative would generate temporary or short-term noise impacts. Construction of this alternative would also include the construction of a recycled water pipeline along public roadways. However, the construction period for this scenario would not be as extensive as the proposed HBEP because the demolition phases would be greatly reduced. Noise impacts would be less than significant with the implementation of the staff-proposed noise conditions of certification related to construction.

The noise impact of this No-Project Alternative scenario would be more than the proposed HBEP as many components of the HBEP would generate less noise than the boilers of the HBGS. However, with implementation of conditions of certification similar to those proposed by staff in the **NOISE AND VIBRATION** section of this FSA, the No-Project wet cooling scenario would likely create a less-than-significant impact at adjacent noise-sensitive receptors.

Public Health

Retrofit Air Cooled Condenser Scenario

The retrofit air cooled condenser scenario overall would have less construction activities when compared to HBEP. Therefore, construction-related diesel particulate matter (DPM) emissions and public health impacts of this retrofit air cooled condenser scenario would be less than the DPM and public health impacts of the proposed HBEP.

Even though the generating station under this retrofit scenario would operate slightly less efficiently than the proposed HBEP, the capacity of the proposed HBEP (939MW) is more than double that of this retrofit scenario (430MW). Staff concludes that the toxic air emissions from project operation under this retrofit scenario would be less than the proposed HBEP. Therefore, during operation, the public health impacts under the retrofit scenario would be less than the proposed HBEP.

Retrofit Wet Cooling Scenario

Under the wet cooling scenario, there would be some construction activities (such as the water source pipeline, on-site water treatment facility and on-site cooling tower). However, the construction activities under this wet cooling scenario overall would be less than the proposed HBEP. Therefore, construction-related DPM emissions and public health impacts of this wet cooling scenario would be less than the DPM and public health impacts of the proposed HBEP.

Under this wet cooling scenario, one concern during project operation would be that the potential exists for bacterial growth (i.e., Legionella[3]) to occur in the cooling system and emissions of toxic air contaminants from cooling tower mist or drift. This public health impact would need to be mitigated to less than significant by applying appropriate conditions of certification. The capacity of the proposed HBEP (939MW) is more than double that of this wet cooling scenario (430MW). Staff concludes that the toxic air emissions from project operation under the wet cooling scenario would be less than the proposed HBEP. Considering that there are adequate mitigation measures available for Legionella and that there would be less toxic air emissions during project operation under the wet cooling scenario, staff concludes that the public health impacts during operation under the wet cooling scenario would be less than the proposed HBEP.

Socioeconomics

Retrofit Air Cooled Condenser Scenario

Retrofitting the existing HBGS to be air cooled would employ a smaller sized construction workforce and have a shorter construction period than the HBEP. Impacts associated with substantial population growth in the project area and the need for new housing would be slightly less than the HBEP. This alternative would not be subject to development impact fees (Chapter 17 of the Huntington Beach Municipal Code- Police Facilities and Parkland Acquisition and Park Facilities Development Impact Fees),

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[3] Legionella is a bacterium that is ubiquitous in natural aquatic environments and is also widely distributed in man-made water systems. It is the principal cause of Legionellosis, also known as Legionnaires' Disease, which is similar to pneumonia. Transmission to people results mainly from inhalation or aspiration of aerosolized contaminated water. Untreated or inadequately treated cooling systems, such as industrial cooling towers and building heating, ventilating, and air conditioning systems, have been correlated with outbreaks of Legionellosis.

unlike the HBEP, as this alternative does not propose new buildings. Also, as no demolition and construction activities would occur at the HBGS, development impact fees are not applicable.

Retrofitting activities would generate benefits such as increased property taxes, construction and operation employment income, and increased state and local sales taxes and fees. The economic benefits would be similar to those for the HBEP.

Retrofit Wet Cooling Scenario

The size of the construction workforce and length of construction period would be less than the HBEP. Impacts associated with substantial population growth in the project area and the need for new housing would be slightly less than the HBEP. This alternative would not be subject to development impact fees (Chapter 17 of the Huntington Beach Municipal Code- Police Facilities and Parkland Acquisition and Park Facilities Development Impact Fees), unlike the HBEP, as this alternative does not propose new buildings. Also, as no demolition and construction activities would occur at the HBGS, development impact fees are not applicable.

Retrofitting activities would generate benefits such as increased property taxes, construction and operation employment income, and increased state and local sales taxes and fees. The economic benefits would be slightly less than those for the HBEP.

Soil and Water Resources

Retrofit Air Cooled Condenser Scenario

Under this scenario, Units 1, 2, 3 and 4 would not be demolished as they would for the proposed HBEP. This would result in slightly less disturbance, but this decrease in disturbance would be offset by the 43 percent larger disturbance required for an air-cooled condenser. Soil disturbance is therefore expected to be similar under this scenario to that of HBEP.

Like the HBEP, this alternative would comply with the SWRCB OTC policy. No difference is therefore expected for impacts to water quality under this scenario. This scenario would require use of a comparable amount of water to the HBEP scenario. Under both scenarios, Units 1 and 2 would be air-cooled and the need for once-through cooling would be eliminated. The impacts to water supply would be similar to the proposed project because the project’s reliance on fresh water use would be reduced under this scenario.

Retrofit Wet Cooling Scenario

This scenario would use non-potable water for the makeup cooling water source. Such water is currently not available to the existing HBGS site and would require a recycled water pipeline to be constructed between the recycled water source and the project site. As described, two potential pipeline routes were considered. This additional disturbance would result in an increase in soil and wind erosion and therefore a slightly greater impact under this scenario. Construction of the wet cooling tower at the proposed location would result in the demolition of various support buildings and facilities. This scenario would result in similar soil disturbance when compared with the HBEP.

The environmental impact to the state's water supplies would be similar for this scenario as the HBEP, because it would reduce the project's reliance on fresh water for cooling. Like the HBEP, this alternative would comply with the SWRCB OTC policy. No difference is therefore expected for impacts to water quality under this scenario.

Traffic & Transportation

Retrofit Air Cooled Condenser Scenario

The air cooled condenser scenario would have less traffic and transportation impacts than the HBEP. It is assumed that this retrofit could utilize identical onsite and offsite laydown and construction staging areas as the HBEP, but would result in less laydown area and construction traffic volumes as the HBEP. Impacts from this No-Project Alternative scenario would be less than the proposed HBEP because of a smaller construction workforce and a shorter construction period. Impacts to aviation safety would be similar as the HBEP due to the presence of thermal air plumes.

Retrofit Wet Cooling Scenario

The wet cooling retrofit scenario would have greater traffic and transportation impacts than the HBEP. Construction and operation traffic would be increased due to the dispersion of construction related traffic impacts. The recycled water pipeline would affect additional roadways and intersections in the project area. Additional temporary roadway closures and staging areas would result in increased construction traffic impacts. The additional water treatment facility would also likely result in increased operation traffic. Impacts from this No-Project Alternative scenario would be greater than those of the proposed HBEP. Impacts to aviation safety would be similar due to the permanent obstruction (cooling tower).

Transmission Line Safety and Nuisance

Retrofit Air Cooled Condenser Scenario

Under this No-Project Alternative scenario, the generating capacity would, at 430 MW be less than one half of the 939 MW proposed for HBEP. Since the same 230-kV transmission line (between HBGS and the on-site SCE Ellis Switchyard) would be used under the Air Cooled Condenser and all other operating scenarios, the electric field levels would be the same during all operations. The magnetic field (which depends on the amount of generated power) would be much less for the retrofitted, lower-capacity HBGS. Since HBEP operation would increase total power generation, it would increase the resulting magnetic field when compared to levels resulting from this retrofitted, lower-capacity HBGS.

Retrofit Wet Cooling Scenario

The generating capacity under the wet cooling scenario would, at 430 MW, be less than half of the 939 MW for the proposed HBEP. As with the air cooled condenser retrofit scenario, all the generated power would be transmitted via the same 230 kV transmission line presently used for power transmission between HBEP and the on-site SCE Switchyard. Since this grid voltage would not change during HBEP operation, the line's electric field (which depends on line voltage) would not change. The grid's magnetic field directly depends on the transmitted power, and therefore the lower power generation under the wet cooling scenario would lead to correspondingly lower magnetic field levels.

Visual Resources

Retrofit Air Cooled Condenser Scenario

The proposed HBEP would involve constructing the HBEP Power Block 1 on the northeast portion of the project site, including its three heat recovery steam generators (HRSGs) and stacks. The air cooled condenser (ACC) for the HBEP Power Block 1 would be constructed next to the HRSGs. The three HRSGs and stacks would be 92 feet tall and 120 feet tall, respectively. The ACC would be 209 feet long and 127 feet wide with a footprint of approximately 26,540 square feet (sq. ft.). The existing HBGS Units 1 and 2, Unit 5 peaker, and the decommissioned fuel oil tank at the farthest northeast portion of the site would be demolished. The HBEP Power Block 2 would be constructed on the west portion of the site and would replace the HBGS Units 3 and 4.

This No-Project Alternative scenario would require retrofitting the HBGS Units 1 and 2 with an ACC that would be constructed in the northeast portion of the HBGS site. Like the proposed HBEP, demolition and removal of the decommissioned fuel oil tank (and perhaps the existing HBGS Unit 5 peaker) would be required. The approximate footprint of the new ACC would cover an area of approximately 37,960 sq. ft. (a footprint increase of 43 percent compared to the ACC unit for the HBEP Power Block 1). Visual Resources staff assumes the vertical profile of the new ACC unit would be similar to the ACC units for the proposed HBEP (104 feet tall), or more than twice the height of the decommissioned fuel oil tank, which is approximately 40 feet tall. Under this No-Project Alternative scenario, the primary visual change would be construction of a new ACC unit in an area that is currently occupied by the much smaller fuel oil tank. The new ACC would appear as an expansive, horizontal, metal structure in the northeast portion of the project site.

The Visual Resources section includes an analysis of seven key observation points (KOPs) that were selected to represent sensitive views and viewer groups in the project area. Of those seven KOPs, staff identifies significant impacts at KOP 4 and KOP 5. Under the proposed HBEP, visual impacts for the other KOPs are considered less than significant largely because the overall visual change compared to existing conditions is considered low or low to moderate. In comparing this No-Project Alternative scenario to the proposed HBEP, staff concludes the following for KOPs where the impact conclusion is less than significant:

- Impact at KOP 1 – Represents views of the project site from Huntington State Beach. Similar to the proposed HBEP, the existing HBGS power block structures at the project site would dominate eastward views from KOP 1. It is possible that the new ACC unit would not be visible from KOP 1. The comparative impact is similar, and the impact conclusion is less than significant (i.e., the same as under the proposed HBEP).

- Impact at KOP 2 – Represents the view from the Huntington Beach Municipal Pier. Similar to the proposed HBEP, the existing HBGS power block structures would not dominate the landscape due to their distance from the viewer, and the addition of the ACC unit would not be noticeable. The comparative impact is similar, and the impact conclusion is less than significant.
- Impact at KOP 3 – Represents the view from Edison Community Park. Similar to the proposed HBEP, the existing HBGS power block structures and the new ACC unit would not dominate the landscape due to their distance from the viewer and the direction of view away from the immediate park environment. The comparative impact is similar, and the impact conclusion is less than significant.
- Impacts at KOPs 6 and 7 – KOP 6 represents the view from the Pacific Coast Highway (PCH) near Brookhurst Street. KOP 7 represents the view from the residential area along Frankfort Avenue northwest of the project site. For both of these KOPs, the existing HBGS power plant structures with the addition of an ACC unit behind existing Units 1 and 2 would not dominate the view due to their distance from the viewer. The comparative impacts are similar, and the impact conclusions are less than significant.

Staff's visual resources analysis for the proposed HBEP identifies significant impacts from constructing and operating the proposed HBEP that also apply to this No-Project Alternative scenario:

- Impact at key observation point (KOP) 4 – KOP 4 represents views from the area along Magnolia Street near its intersection with the Pacific Coast Highway (PCH). Views from KOP 4 and other nearby viewpoints represented by this viewpoint have the closest, unscreened views of the southeast-east side of the project site. The existing HBGS Units 1 and 2 and their one 200-foot-tall stack would remain on the southeast part of the site. Construction of the ACC unit for this alternative would introduce a new, expansive power plant structure in the northeast portion of the site (the same area as the proposed HBEP Power Block 1). Under the proposed HBEP, a change in the massing of project structures would occur, including replacement of the HBGS Units 1 and 2 with three (each) combustion gas turbines (89 feet long, 32 feet wide, and 34 feet high), HRSGs (77 feet long, 44 feet wide, and 92 feet high), and stacks (120 feet high). Although some of the HBEP power block structures would be shorter compared to the existing HBGS generating units that would remain in place under this alternative, the overall area occupied by power block structures at the site would be greater under the HBEP compared to the existing structures. Under this alternative, no new power block structures would be constructed in the northeast portion of the site. Staff concludes that the visual impact at KOP 4 would be similar to HBEP, and mitigation measures would be required to reduce the impact to less than significant.
- Impact at KOP 5 – KOP 5 represents views from Newland Street and the Huntington By-The-Sea Mobile Estates and RV Park next to the PCH. Views from KOP 5 and other nearby viewpoints represented by this KOP have foreground views of the west

side of the project site that are largely unscreened. The existing HBGS Units 3 and 4 would remain on the southwest part of the site. No new, visually dominant structures would be constructed on the west side of the project site under this scenario. The HBEP Power Block 2 and the associated ACC unit would not be constructed adjacent to Newland Street, and the visual impact at KOP 5 would be somewhat less than HBEP.

- Construction-Related Effects – Construction of the new ACC unit would require the use of heavy construction equipment and vehicles during demolition and construction activities. This visual resources impact could include off-site construction parking areas. Because the overall duration and extent of construction would be less compared to the proposed HBEP, this impact would be less than HBEP. Like the proposed project, this impact would be reduced to less than significant with implementation of mitigation measures.
- Project construction lighting – Although the construction schedule for this alternative is unknown, it is possible that portions of the project site could appear as brightly lit areas for limited times during construction of the new ACC unit. Construction activities have the potential to create a new source of substantial light or glare that could adversely affect nighttime views in the area. Because the overall duration and extent of construction would be less compared to the proposed HBEP, this impact would be less than HBEP. Like the proposed project, this impact would be reduced to less than significant with implementation of mitigation measures.
- Project operations lighting – Project operations lighting would increase with installation of new power plant structures on the northeast portion of the HBGS site. Under this No-Project Alternative scenario, it is assumed that structural lighting of the HBGS Units 1 and 2 would be unchanged, and overall lighting levels on the east side of the project site could increase somewhat compared to the proposed HBEP. Because no details on lighting are available for the proposed HBEP or the alternatives, staff concludes that the impact of project operations lighting would be similar to HBEP. Like the proposed HBEP, this impact would be reduced to less than significant with implementation of mitigation measures.
- Potential daytime glint or glare from project structures – The potential for glint or glare from the new ACC unit to adversely affect daytime views in the project area is considered a potentially significant impact of this alternative. This impact would be similar to HBEP. Like the proposed HBEP, this impact would be reduced to less than significant with implementation of mitigation measures.

Retrofit Wet Cooling Scenario

This No-Project Alternative scenario would require a structure for the water treatment facility approximately 23 feet tall and cover a minimum of 13,000 sq. ft. A long, narrow (approximately 60 feet wide, 650 feet long, and 50 feet tall) wet cooling tower would be constructed next to the water treatment facility. These new structures would be constructed across the middle of the HBGS site in the area between the existing HBGS power blocks and the SCE 230-kV switchyard. Various buildings and facilities would be demolished to allow construction of the water treatment facility and wet cooling tower on the HBGS site. It is unknown to Visual Resources staff if the demolished structures would be reconstructed elsewhere on the site.

Given the coastal location of the HBGS, it is assumed that a plume abated cooling tower would be required. Visible plume abatement could be achieved with a wet/dry tower to mix unsaturated hot air with saturated hot air to create an unsaturated exhaust. A wet/dry cooling tower would significantly lower the potential for visible plume formation, but depending on the design and ambient conditions at the site, visible plumes could still form above the cooling towers. If the HBGS was retrofitted with wet cooling, mitigation measures would be required to reduce the potential size and frequency of visible plume formation to acceptable levels.

As described above, visual impacts for KOPs 1, 2, 3, 6, and 7 under the proposed project are considered less than significant largely because the overall visual change compared to existing conditions is considered low or low to moderate. Staff compared this No-Project Alternative scenario to the proposed HBEP and concludes less than significant impacts for these KOPs. For the same essential reasons described under the Retrofit Air Cooled Condenser Scenario, the comparative impacts are similar, and the impact conclusions are less than significant.

Staff's visual resources analysis identifies significant impacts from constructing and operating the proposed HBEP that are described above for the air cooled retrofit scenario. The following apply to this No-Project Alternative scenario:

- Impact at KOP 4 –It is unknown if structures that would be demolished under this No Project Alternative scenario would be reconstructed at other locations on the site that could be visible from KOP 4. The cooling tower would be less visually dominant compared to the HBEP Power Block 1. Under the proposed HBEP, a change in the massing of project structures would occur, including replacement of the HBGS Units 1 and 2 with three (each) combustion gas turbines, HRSGs, and stacks (dimensions listed above under the Retrofit ACC Scenario). Although some of the HBEP power block structures would be shorter compared to the existing HBGS generating units that would remain in place under this alternative, the overall area occupied by power block structures at the site would be greater under the HBEP compared to the existing structures. Staff assumes that a plume abated cooling tower would be required and that mitigation measures would reduce the potential size and frequency of visible plume formation to acceptable levels. Under this alternative, no new power block structures would be constructed in the northeast portion of the site. Staff concludes that the visual impact at KOP 4 would be similar to HBEP, and mitigation measures would be required to reduce the impact to less than significant.
- Impact at KOP 5 – Installation of the water treatment unit and wet cooling tower would introduce new power plant structures that would likely be visible from KOP 5. The existing HBGS Units 3 and 4 would remain on the southwest part of the site. The vertical profiles of the water treatment unit and wet cooling tower would likely be less visually dominant compared to the ACC unit for the HBEP Power Block 2. The HBEP Power Block 2 and the associated ACC unit would not be constructed adjacent to Newland Street, and the visual impact at KOP 5 would be somewhat less than HBEP.
- Construction-Related Effects – Construction of the recycled water pipeline, water treatment unit, and wet cooling tower would require the use of heavy construction equipment and vehicles during demolition and construction activities. This visual

resources impact could include off-site construction parking areas. Because the overall duration and extent of construction would be less compared to the proposed HBEP, this impact would be less than HBEP. Like the proposed HBEP, this impact would be reduced to less than significant with implementation of mitigation measures.

- Project construction lighting – Although the construction schedule for this alternative is unknown, it is possible that portions of the project site could appear as brightly lit areas for limited times during construction of the water treatment unit and wet cooling tower. Construction activities have the potential to create a new source of substantial light or glare that could adversely affect nighttime views in the area. Because the overall duration and extent of construction would be less compared to the proposed HBEP, this impact would be less than HBEP. Like the proposed HBEP, this impact would be reduced to less than significant with implementation of mitigation measures.
- Project operations lighting – Project operations lighting would increase with installation of new power plant structures across the project site. Under this No-Project Alternative scenario, it is assumed that structural lighting of the existing HBGS power blocks would be unchanged. Overall lighting levels across the project site between the power blocks and the SCE switchyard could potentially increase compared to the proposed HBEP. Because no details on lighting are available for the proposed HBEP or the alternatives, staff concludes that the impact of project operations lighting would be similar to HBEP. Like the proposed HBEP, this impact would be reduced to less than significant with implementation of mitigation measures.
- Potential daytime glint or glare from project structures – The potential for glint or glare from the new power plant structures to adversely affect daytime views in the project area is considered a potentially significant impact of this alternative. This impact would be similar to HBEP. Like the proposed HBEP, this impact would be reduced to less than significant with implementation of mitigation measures.

Waste Management

Retrofit Air Cooled Condenser Scenario

Due to the proposed location of the air cooled condenser retrofit, removal of aboveground storage tanks (ASTs) located in the eastern portion of HBGS would not be required. There is no non-hazardous or hazardous demolition waste associated with the air cooled condenser retrofit. Therefore, there will be less waste generated by the air cooled condenser retrofit. It is also likely remediation of petroleum contaminated soil around AST bottoms and associated piping would be required for HBEP. If this were the case, then implementing this alternative further reduces the quantities of non-hazardous and hazardous waste. Thus, this No-Project Alternative scenario would have slightly less impacts when compared to the HBEP.

Retrofit Wet Cooling Scenario

Management of the waste generated during demolition, construction and operation of the HBEP would not result in any significant adverse impacts. Due to the proposed location of the wet-cooling retrofit, removal of ASTs located in the eastern portion of HBGS would not be required. Thus, this No-Project Alternative scenario would have at least the same impacts compared to the HBEP.

Worker Safety & Fire Protection

Retrofit Air Cooled Condenser Scenario

As compliance with LORS related to worker safety/fire protection at the proposed project would have no significant impacts off-site, there would be no significant impact on the public resulting from the proposed project. This scenario would also comply with LORS and have no significant impacts off-site. Impacts from this No-Project Alternative scenario would be similar to the proposed HBEP.

Retrofit Wet Cooling Scenario

As compliance with LORS related to worker safety/fire protection at the proposed project would have no significant impacts off-site, there would be no significant impact on the public resulting from the HBEP. This scenario would also comply with LORS and have no significant impacts off-site. Impacts from this No-Project Alternative scenario would be similar to the proposed HBEP.

CONCLUSION

As shown in **Alternatives Table 1**, when comparing impacts of the HBEP against the No-Project Alternative scenarios, there would be a reduction to impacts of certain resource areas (such as Air Quality, Biological Resources, and Visual Resources). However, has also shown in **Alternatives Table 1**, the No-Project Alternative scenarios would result in an increase to impacts of certain resource areas (such as Traffic & Transportation, Cultural Resources, and Geology and Paleontology).

The No-Project Alternative for the HBEP is not a traditional “no build” alternative, which is often the case under CEQA. When reviewing the impact summary comparisons provided in **Alternatives Table 1** for all issue areas, the No-Project Alternative scenarios (Dry Cooling Retrofit and Wet Cooling Retrofit) would lessen potential impacts of the HBEP. CEQA Guidelines (Cal. Code Regs., tit. 14, §15126.6[e][2]) require that if the environmentally superior alternative is the No-Project Alternative, “the EIR shall also identify an environmentally superior alternative among the other alternatives.” While reducing impacts in these resource areas, the Dry Cooling Retrofit Scenario would meet half of the HBEP objectives and partially meet one objective. The Wet Cooling Retrofit Scenario would meet two HBEP objectives and partially meet two objectives. Neither retrofit alternative would meet the HBEP’s objectives of providing efficient, reliable and flexible generation. Therefore, the environmentally superior alternative is the proposed HBEP.

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Compliance Conditions and Compliance Monitoring Plan

COMPLIANCE CONDITIONS
AND
COMPLIANCE MONITORING PLAN

Testimony of Eric Veerkamp

INTRODUCTION

The Huntington Beach Energy Project's Compliance Conditions of Certification, including a Compliance Monitoring Plan (Compliance Plan), are established as required by Public Resources Code section 25532. 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.

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 Huntington Beach Energy Project.

COMPLIANCE PROJECT MANAGER RESPONSIBILITIES

The CPM's compliance monitoring and project oversight responsibilities include:

1. ensuring that the design, construction, operation, and closure of the project facilities are in compliance with the terms and conditions of the Decision;

2. resolving complaints;

3. 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 (see COM-10 for instructions on filing a Petition to Amend or to extend a construction start date);

4. documenting and tracking compliance filings; and

5. 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 Code Standards, 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 delegates 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 Huntington Beach Energy Project 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 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 Compliance Plan.

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 Huntington Beach Energy Project 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 that shall not have 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. Verification may be modified by the CPM without requesting a Decision amendment 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.

COMPLIANCE CONDITIONS OF CERTIFICATION

For the Huntington Beach Energy Project, staff proposes the Compliance Conditions of Certification below.

COM-1: Unrestricted Access. The project owner shall take all steps necessary to ensure that the CPM, responsible Energy Commission staff, and delegated agencies or consultants have unrestricted access to the facility site, related facilities, project-related staff, and the records maintained on-site to facilitate audits, surveys, inspections, and general or closure-related site visits. Although the CPM shall 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 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. The files shall also contain at least one hard copy of:

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.

COM-3: Compliance Verification Submittals. 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
Huntington Beach Energy Project (12-AFC-02)
California Energy Commission
1516 Ninth Street (MS-2000)
Sacramento, CA 95814

COM-4: **Pre-Construction Matrix and Tasks Prior to Start of Construction.** Prior to start of construction, the project owner shall submit to the CPM a compliance matrix including <u>only</u> those conditions that must be fulfilled before the start of construction. The matrix shall 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.

Site mobilization and construction activities shall not start until all of the following occur: the 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.

If the project owner anticipates site mobilization immediately following project certification, it may be necessary for the project owner to file compliance submittals prior to project certification. In these instances, compliance verifications can be submitted in advance of the required deadlines and the anticipated authorizations to start construction. The project owner must understand that submitting compliance verification requirements prior to 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.

COM-5: **Compliance Matrix.** The project owner shall submit a compliance matrix to the CPM with each MCR and ACR. The compliance matrix provides the CPM with the status of all conditions of certification in a spreadsheet format. The compliance matrix 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 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.

The CPM can provide a template for the compliance matrix upon request.

COM-6: **Monthly Compliance Reports and Key Events List.** The first MCR is due one (1) month following the docketing of the project's Decision unless otherwise agreed to by the CPM. The first MCR 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 this Compliance Plan).

During project pre-construction, construction, or closure, the project owner or authorized agent shall submit an electronic searchable version of the MCR within ten (10) business days after the end of each reporting month, unless otherwise specified by the CPM. MCRs 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 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 MCR; each of these items shall be identified in the transmittal letter, as well as the conditions they satisfy, and submitted as attachments to the MCR;

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; the project owner shall notify the CPM as soon as any changes are made to the project construction schedule that would affect compliance with conditions of certification;

9. a list 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 actions taken to date to resolve the issues; and the status of any unresolved actions.

COM-7: Annual Compliance Reports. After construction is complete, the project owner must submit searchable electronic ACRs instead of MCRs. 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 ACR must include the AFC number, identify the reporting period, and 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 ACR; each of these items shall be identified in the transmittal letter with the condition it satisfies and submitted as an attachment to the ACR;
4. a cumulative list of all post-certification changes approved by the Energy Commission or 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 Site Contingency Plan, including amendments and plan updates; and
10. a list of complaints, notices of violation, official warnings, and citations received during the year, a description of how the issues were resolved, and the status of any unresolved matters.

COM-8: Confidential Information. Any information that the project owner 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 deemed confidential pursuant to the regulations shall remain undisclosed, as provided in Title 20, California Code of Regulations, section 2501.

COM-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 annually adjusted compliance fee. Current compliance 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. All subsequent payments are due by July 1 of each year in which the facility retains its certification.

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, or to transfer ownership or operational control of the facility. The CPM will determine whether staff approval will be sufficient, or whether Commission approval will be necessary. **It is the project owner's responsibility to contact the CPM to determine if a proposed project change triggers 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: Reporting of Complaints, Notices, and Citations. Prior to the start of construction or decommissioning, the project owner 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.

The project owner shall respond to all recorded complaints within twenty-four (24) hours or the next business day. The project site shall post the telephone number on-site and make it easily visible to passersby during construction, operation, and closure. The project owner shall provide the contact information to the CPM who will post it on the Energy Commission's web page at http://www.energy.ca.gov/sitingcases/huntington_beach_energy/index.html. 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 including 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. Complaints shall be logged and numbered. Noise complaints shall be recorded on the form provided in the Noise and Vibration Conditions of Certification. All other complaints shall be recorded on the complaint form (Attachment A) at the end of this Compliance Plan.

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 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, as appropriate, 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.

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 statement of specific Final Closure Plan objectives;
2. 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. 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 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 revised/updated Final Cost Estimate for all closure activities, by phases, including site monitoring and maintenance costs, and long-term equipment replacement;
6. 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. 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. all information additionally required by the facility's conditions of certification applicable to plant closure;

9. 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 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. 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. 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. updated mailing list or listserv of all responsible agencies, potentially interested parties, and property owners within one (1) mile of the facility;

14. identification of alternatives to plant closure and assessment of the feasibility and environmental impacts of these; and

15. 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 ConditionsTable 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.
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.

Compliance Table 1:
Summary of Compliance Conditions of Certification

CONDITION NUMBER	SUBJECT	DESCRIPTION
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 and RESOLUTION FORM

COMPLAINT LOG NUMBER:________________________ DOCKET NUMBER:__________________________

PROJECT NAME:____

COMPLAINANT INFORMATION

NAME:____ PHONE NUMBER:____________________________

ADDRESS:____

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)

Declarations

&

Resumes

DECLARATION OF
Edward James Brady

I, **Edward James Brady,** 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 Mechanical Engineer.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I prepared the staff testimony on Noise, Facilities Design, Plant Efficiency and Reliability for the **Huntington Beach Energy Project Final Staff Assessment,** based on my independent analysis of the Application for Certification and supplement hereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: 5/13/14 Signed: Edward J 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

Huei-An (Ann) Chu

I, Huei-An (Ann) Chu, 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 an Air Resources 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 **Public Health** for the **Huntington Beach Energy Project Final Staff Assessment,** based on my independent analysis of the Application for Certification and supplement hereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: Huei-An Chu Signed: 5/13/2014

At: Sacramento, California

Huei-An (Ann) Chu

1600 Tamarack Ln, Davis, CA 95616
Phone: 530-899-9604, Email: Ann.Chu@energy.ca.gov
Citizenship Status: Green Card

EDUCATION

PhD, Environmental Sciences and Engineering, 05/2006
School of Public Health, University of North Carolina at Chapel Hill
Area of Specialization: Environmental Risk Assessment, Environmental Management and Policy, Risk-Based Regulation, Biostatistics, Environmental Epidemiology

MEM, Environmental Management, 05/2000
School of Forestry and Environmental Studies, Yale University, New Haven, CT

MS, Environmental Engineering, 06/1998
National Taiwan University, Taipei, Taiwan

BA, Geography, with honors, 06/1996
National Taiwan University, Taipei, Taiwan

SKILLS

Language: Fluent in Chinese and English.

Computer software and programming skills: HARP, SAS, Stata, Minitab, ArcGIS, ArcView, ArcInfo, Stella, Crystal Ball, ISC, ERMapper, Microsoft Excel, PowerPoint, Word.

WORK EXPERIENCE

Air Resources Engineer, California Energy Commission, 1/12/2012 - Present
- Independently performs responsible, varied analyses assessing air quality and public health impacts of energy resource use and large electric power generation projects in California.
- Model air quality and public health impacts of stationary sources using HARP (Hot Spot Analysis and Reporting Program).
- Identify air quality and public health impacts of stationary sources and measures to mitigate these impacts following California Environmental Quality Act and regulations of US EPA (including the National Environmental Policy Act), ARB, and the Districts.
- Collect, analyze, and evaluate data on the effects of air pollutants and power plant emissions on human health, and the environment.
- Ensure conditions of certification are met and recommending enforcement actions for violations.

Research Associate, Taiwan Development Institute, 10/01/2010 – 12/31/2011
- Provided professional consultation for the environmental risk assessment of Taiwan's techno-industrial development initiatives
- Reviewed the environmental risk assessment reports of Taiwan's techno-industrial development initiatives
- Presented in various distinguished lecturer series about environmental risk assessment

Consultant, Chu Consulting, 08/2007 - 07/2010
- Conducted a cumulative risk assessment to evaluate the risk associated with the emissions of VOCs from a petrochemical plants in southern Taiwan
- Used EPA's ISC3 model (based on Gaussian dispersion model) to simulate the dispersion and deposition of VOCs from this petrochemical plant to the neighboring areas, then used ArcGIS to spatially combine the population data and VOC simulation data (and further calculated risks)

- Built a framework of risk-based decision making to set the emission levels of VOCs to reduce people's exposure and the risk of experiencing health problems
- Presented in conference: SRA 2007
- Awarded: CSU-Chico BBS Faculty Travel Funds (2007)

Environmental Justice Intern, Clean Water for North Carolina (CWFNC), Summer, 2005
- Reviewed and critiqued key state environmental policies and the federal EPA Public Participation Policy.
- Interviewed impacted communities, member organizations of the NC Environmental Justice Network, state policy officials about how those policies are actually implemented.
- Wrote a report about the survey and review of environmental justice needs for key state policies.
- Report Publication: "Achieving Environmental Justice in North Carolina Public Participation Policy" (Aug, 2005).

Volunteer, New Haven Recycles and Yale Recycling, 08/1998 – 05/2000
- Promoted recycling and conservation
- Checked trash cans (chosen randomly) and recycling bins at each entryway of residential college, then gave grades.

Volunteer, Urban Resource Initiative (URI), Summer, 1998
- Planted trees for local community of New Haven for a better and sustainable environment

RESEARCH EXPERIENCE

Postdoctoral Research

Department of Public Health Sciences, University of California, Davis, 07/01/2010 - present
Research advisor: Dr. Deborah H. Bennett and Dr. Irva Hertz-Picciotto
- Work on two projects: NIEHS-funded ***Childhood Autism Risks from Genetics and Environment (CHARGE)*** and EPA-funded ***Study of Use of Products and Exposure Related Behavior* (*SUPERB)***.
- Perform statistical and quantitative analyses with SAS to analyze collected house dust data and children's urine concentrations of metabolites.
- Conduct exposure assessment to investigate if pesticides, flame retardants, and phthalates are risk factors for children autism.
- Conduct exposure assessment to explore the relationships between children's exposure to phthalate, benzophenone-3 (oxybenzone), triclosan, and parabens, and the use of personal care products.
- Produce scholarly peer-reviewed publications of methodology and findings, and write the final reports of both projects.

Carolina Environmental Program, University of North Carolina at Chapel Hill, 01/01/2006 – 12/31/2006
Research advisor: Dr. Douglas J. Crawford-Brown
- Applied a framework of risk-based decision-making to perchlorate in drinking water. (Awarded: SRA Annual Meeting Travel Award 2006)
- Conducted a material and energy flow analysis (MEFA) to quantify the overall environmental impact of Bank of America operations, and quantitatively analyze the strategies BOA might adopt to reduce these impacts and achieve sustainability. (Report Publication: "Environmental Footprint Assessment")

Doctoral Research, 08/2000-12/2005

Department of Environmental Sciences and Engineering, School of Public Health, University of North Carolina at Chapel Hill
Research advisor: Dr. Douglas J. Crawford-Brown
- Dissertation topic: "**A framework of Risk-Based Decision Making by Characterizing Variability and Uncertainty Probabilistically: Using Arsenic in Drinking Water as an Example**".
- Conducted risk assessment for arsenic in drinking water.
- Conducted theoretical analysis on the variability and uncertainty issues of risk assessment.

- Conducted a meta-analysis to improve dose-response assessment.
- Conducted analytical and numerical analysis to build a new framework of risk-based decision-making which can be applied coherently across the regulation decisions for different contaminants.
- Presented in conferences: APPAM (2004), SRA (2004, 2005 and 2006), DESE Seminar (2005), CEP Symposium on Safe Drinking Water (2006).
- Awarded: SRA Annual Meeting Student Travel Award (2004 & 2005), UNC-CH Graduate School Travel Grants (2004), UCIS Doctoral Research Travel Awards (2002).

Master's Research

School of Forestry and Environmental Studies, Yale University, 08/1999 - 06/2000
Research advisor: Dr. Xuhui Lee

- Master's project: "**Forest Stand Dynamics and Carbon Cycle**".
- Research project: "Monitoring Forest CO_2 Uptaking"
- Used remote sensing (ERMapper) to investigate the role of forest in the uptake of CO_2.
- Awarded from Teresa Heinz Scholars for Environmental Research Program (2000) and Klemme Award (1999).

Graduate Institute of Environmental Engineering, National Taiwan University, 06/1996 - 06/1998
Research advisor: Dr. Shang-Lien Loh

- Master's thesis: "**The Loads of Air Pollutants from Urban Areas on a Neighboring Dam and its Water Quality**"
- Research Projects: "Research on Air Pollutant Deposition in Urban Areas" and "the Fate and Flow of Recyclable Materials"
- Used Gaussian's Dispersion model (ISC3) to investigate the loads of air pollutants on dam water.

TEACHING EXPERIENCE

Lecturer

Department of Environmental Studies, California State University at Sacramento

- Environmental Politics and Policy, Fall 2011

Department of Geological & Environmental Science, California State University at Chico

- Environmental Risk Assessment, Spring 2009 & 2010
- Applied Ecology, Spring 2008
- Pollution Ecology, Fall, 2007

Department of Geography & Planning, California State University at Chico

- Seminar in Applied Geography & Planning – Environmental Regulation and Policy, Fall, 2007

Department of Forestry and Environmental Resources, North Carolina State University

- Environmental Regulation, Fall, 2006

Teaching Assistant

Department of Environmental Sciences and Engineering, UNC-Chapel Hill

- Environmental Risk Assessment, Spring, 2002
- Introduction to Environmental Science, Fall, 2001
- Analysis and Solution of Environmental Problems, Fall, 2001

Lab Instructor

Department of Environmental Sciences and Engineering, UNC-Chapel Hill

- Biology for Environmental Science, Fall, 2000

Graduate Institute of Environmental Engineering, National Taiwan University

- Water Quality Analysis, Fall, 1997

AWARDS and HONORS

- CSU-Chico BBS Faculty Travel Funds, 2007
- Member of Society of Risk Analysis (SRA), 2006-2008
- SRA Annual Meeting Student Travel Award, 2004-2006
- UNC-CH Graduate School Travel Grants, 2004
- Member of Association for Public Policy Analysis and Management (APPAM), 2004-2005
- UCIS Doctoral Research Travel Awards, 2002
- Graduate Student Teaching and Research Assistantships, 2000-2005
- Teresa Heinz Scholars for Environmental Research Program, 2000
- Yale Forestry & Environmental Studies, Klemme Award, 1999

PUBLICATIONS (SELECTED LIST)

Huei-An Chu*,* Deborah H. Bennett, Irva Hertz-Picciotto, "Phthalates in relation to autism and developmental delay: Exploratory analyses from the CHARGE Study". (In preparation)

Huei-An Chu*,* Deborah H. Bennett, Irva Hertz-Picciotto, "Peronal Care Products: Possible Sources of Children Phthalate Exposure". (In preparation)

Huei-An Chu and Douglas J. Crawford-Brown, "A Probabilistic Risk Assessment Framework to Quantify the Protectiveness of Alternative MCLs for Arsenic in Drinking Water", *Journal of American Water Works Association*. (Being revised)

Huei-An Chu and Douglas J. Crawford-Brown, "Letter to the Editor: Inorganic Arsenic in Drinking Water and Bladder Cancer: A Meta-Analysis in Dose-Response Assessment", *International Journal of Environmental Research and Public Health*, 2007, 4(4), 340-341.

Huei-An Chu and Douglas J. Crawford-Brown, "Inorganic Arsenic in Drinking Water and Bladder Cancer: A Meta-Analysis in Dose-Response Assessment", *International Journal of Environmental Research and Public Health* 2006, 3(4), 316-322.

S.L. Lo and **H.A. Chu**, "Evaluation of Atmospheric Deposition of Nitrogen to the Feitsui Reservoir in Taipei", *Water Science & Technolog*y, 2006, 53(2), 337-344.

CSE Consulting and the UNC Carolina Environmental Program (CEP), "Environmental Footprint Assessment", Report for Bank of America, Aug, 2006.

Huei-An Chu, "Achieving Environmental Justice in North Carolina Public Participation Policy", Report for Clean Water for North Carolina (CWFNC), Aug, 2005.

Huei-An Chu, "Arsenic and its Health Implications", Report for University Center for International Studies Graduate Travel Awards, 2002.

PRESENTATIONS (SELECTED LIST)

Guest Speaker, "Human Health Risk Assessment – Arsenic in Drinking Water as an Example". Tunghai University, Taichuang, Taiwan. (December 16th, 2010)

Guest Speaker, "Environmental Problems in Developing Countries", Course Title: Developing Countries, Department of Economics, CSU-Chico (October 31st, 2008)

"Cumulative Risk Assessment for Volatile Organic Compounds (VOCs) from Petrochemical Plants in Southern Taiwan". Oral Presentation in Society of Risk Analysis (SRA) 2007 Annual Meeting, San Antonio, TX. (December, 2007)

Guest Speaker, "Arsenic in Drinking Water", Course Title: Environmental Geology, CSU-Chico. (November 13th, 2007)

"Risk-Based Environmental Regulation for Arsenic in Drinking Water", Oral Presentation in Department of Environmental Health Seminar, East Tennessee State University (February 2nd, 2007)

"A Framework of Risk-based Decision Making by Characterizing Variability and Uncertainty Probabilistically: Using Arsenic in Dinking Water as an Example", Oral Presentation in Society of Risk Analysis (SRA) 2006 Annual Meeting, Baltimore. MD. (December, 2006)

"A New Policy Tool to Choose Water Quality Goals under Uncertainty", Poster Presentation in Society of Risk Analysis (SRA) 2006 Annual Meeting, Baltimore. MD. (December, 2006)

"A framework of Risk-Based Decision Making by Characterizing Variability and Uncertainty Probabilistically: Using Arsenic in Drinking Water as an Example", Oral Presentation for National Center for Environmental Assessment (NCEA), Environmental Protection Agency (EAP). (October 26th, 2006)

"Probabilistic Risk Assessment for Arsenic in Drinking Water", Poster Presentation in Carolina Environmental Program (CEP) 2006 Symposium on Safe Drinking Water, Chapel Hill, NC. (March, 2006)

"Probabilistic Risk and Margins of Safety for Water Borne Arsenic", Poster Platform Presentation in Society of Risk Analysis (SRA) 2005 Annual Meeting, Orlando, FL. (December, 2005)

"Using Meta-Analysis in Dose-Response Analysis – Risk Assessment of Arsenic in Drinking Water as an Example", Poster Platform Presentation in Society of Risk Analysis (SRA) 2004 Annual Meeting, Palm Springs, CA. (December, 2004)

DECLARATION OF
Mike Conway

I, **Mike Conway,** 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 an Engineering Geologist.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I prepared the staff testimony on **Soil and Water Resources** for the **Huntington Beach Energy Project Final Staff Assessment,** based on my independent analysis of the Application for Certification and supplement hereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: 4-28-14 Signed: Mike Conway

At: Sacramento, California

Resume For: Mike Conway

Education: Bachelor of Science in Geology, University of California, Davis, August 2003.
Master of Science in Geology, California State University, Sacramento, expected 2011

Certifications: 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
- Prepared proposals for outgoing environmental quality project bids
- Performed field visits to evaluate Best Management Practice (BMP) effectiveness in reducing erosion and sedimentation
- 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
Scott Debauche

I, **Scott Debauche,** declare as follows:

1. I am presently employed by Aspen Environmental Group, a consultant to the California Energy Commission, Siting, Transmission and Environmental Protection Division, as a **Technical Specialist**.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I prepared the staff testimony on **Alternatives** for the **Huntington Beach Energy Project Final Staff Assessment,** based on my independent analysis of the Application for Certification and supplement hereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: May 9, 2014 Signed: ______________

At: Agoura Hills, California

SCOTT DEBAUCHE, CEP
Environmental Planner

Academic Background and Credentials

BS, Urban Planning and Design, University of Minnesota, 1995

Board Certified Environmental Planner (CEP) #12040973
U.S. Council of Engineering & Scientific Specialty Boards/ABCEP

Professional Experience

Mr. Debauche is an environmental planner with 18 years of experience preparing NEPA and CEQA documents, planning reports, and analytical technical studies for a variety of large-scale infrastructure and civil projects. Additionally, Mr. Debauche's experience includes senior level preconstruction and construction compliance monitoring. Through his work, Mr. Debauche serves as a technical specialist and qualified expert witness for Transportation/Traffic, Noise, Aesthetics, Socioeconomics, Environmental Justice, Alternatives, and construction-design issues related to agency decisions and legal challenges under NEPA, CEQA, and other permitting requirements. The projects described below highlight his experience and complete work history.

Aspen Environmental Group 2001-present

Power Generation and Transmission Projects

California Energy Commission (CEC). Aspen, as the prime on-call contractor for the CEC, evaluates the environmental, siting, and engineering aspects of new power plant applications throughout the California. This includes the preparation of environmental analyses under both NEPA and CEQA. As part of this effort, Mr. Debauche works as a senior technical specialist and serves as an Energy Commission expert witness for Transportation/Traffic, Socioeconomics, Alternatives, Environmental Justice, and Visual Resource (Glint and Glare) issues. His list of Energy Commission project analyses include:

- **Hydrogen Energy California Power Plant Project, Kern County, CA.** The newly proposed HECA project includes a 400-megawatt (MW) power plant that would produce hydrogen to fuel a combustion turbine. The gasification component of the plant would capture carbon dioxide, which would be transported and used for enhanced oil recovery (EOR) and sequestration in the adjacent Elk Hills Oil Field. The project would also capture and harness the remaining hydrogen to produce approximately 1 million tons of fertilizer for domestic use.
- **Redondo Beach Energy Project, Los Angeles County, CA**. Project includes a proposed natural gas fired, combined-cycle, air-cooled electrical generating facility with a net generating capacity of 496 MW, which will replace, and be constructed on the site of the existing AES Redondo Beach Generating Station.
- **Huntington Beach Energy Project, Orange County, CA.** Project includes a proposed natural gas fired, combined-cycle, air-cooled electrical generating facility with a net generating capacity of 939 MW, which will replace, and be constructed on the site of the existing AES Huntington Beach Generating Station.
- **Desert Renewable Energy Conservation Plan (DRECP).** The DRECP, when completed, will provide binding long-term permit assurances while facilitating the review and approval of renewable energy projects in the Mojave and Colorado deserts of California. The DRECP area contains approximately 22.5 million acres of land within the desert regions and adjacent communities of seven California counties – Imperial, Inyo, Kern, Los Angeles, Riverside, San Bernardino, and San Diego.

- **Blythe Solar Power Project, Riverside County, CA.** 1,000 MW solar thermal electric generating facility and required new transmission line interconnections.
- **Calico Solar Project, San Bernardino County, CA.** 850 MW solar electric generating facility and required new transmission line interconnections located on both private and BLM lands.
- **Rice Solar Energy Project, Riverside County, CA.** 150 MW solar thermal renewable energy facility and required new transmission line interconnections located on both private and BLM lands.
- **Palen Solar Power Project, Riverside County, CA.** 500 MW solar thermal electric generating facility and required new transmission line interconnections located on both private and BLM lands.
- **Ivanpah Solar Electric Generating System Project, San Bernardino County, CA.** 400 MW solar thermal electric power generating system and required new transmission line interconnections located on both private and BLM lands.
- **Carlsbad Energy Center Project, San Diego County, CA.** 558 MW gross combined-cycle generating facility. The project required a detailed analysis pertaining to potential aviation safety impacts to nearby Palomar Airport air traffic, cumulative impacts from the adjacent I-5 widening project, and thorough alternative siting evaluation based on extensive City of Carlsbad and intervener opposition during testimony.
- **Genesis Solar Power Project, Riverside County, CA.** 250 MW solar thermal electric generating facility and required new transmission line interconnections on both private and BLM lands.
- **Oakley Generating Station Project, Contra Costa County, CA.** 624 MW natural gas–fired, combined-cycle electrical generating facility and required new transmission line interconnections.
- **CPV Vaca Station Power Plant Project, Solano County, CA.** 660 MW natural gas–fired, combined-cycle electrical generating facility and required new transmission line interconnections.
- **Watson Cogeneration Steam and Electric Reliability Project, Los Angeles County, CA.** 85 MW combustion turbine generator to provide additional process steam to the BP Carson refinery.
- **GWF Tracy Combined-Cycle Power Plant Project, San Joaquin County, CA.** Project added 145 MW to an existing 169 MW simple-cycle plant, by converting into a combined-cycle power generating facility.
- **Kings River Conservation District Community Peaker Power Plant Project, Fresno County, CA.** 97 MW natural gas–fired peaker plant.
- **Inland Empire Energy Center Project, Riverside County, CA.** 670 MW natural gas–fired, combined-cycle electric generating facility and associated linear infrastructure (natural gas and reclaimed water).
- **Abengoa Mojave Solar Power Project, San Bernardino County, CA.** 250 MW solar electric generating facility and associated transmission line interconnection. The project will implement well-established parabolic trough technology to solar heat a heat transfer fluid (HTF) technology.
- **Canyon Power Plant Project, Orange County, CA.** 200 MW simple-cycle peaker plant.
- **Avenal Energy Project, Kings County, CA.** 600 MW combined-cycle electrical generating facility and associated transmission line infrastructure.
- **Lodi Energy Center Project, San Joaquin County, CA.** 225 MW combined-cycle electrical generating facility and associated transmission line interconnections.
- **Coastal Plant Study, Coastal Counties of California.** The Coastal Plant Study, which considered the re-tooling, or expansion of California's 25 coastal power plants.

California Public Utilities Commission (CPUC). Under Aspen's ongoing environmental services contract with the CPUC, Mr. Debauche conducts senior level environmental analyses (NEPA and CEQA) and construction compliance monitoring for utility-scale transmission line infrastructure projects within the State. As part of this effort, Mr. Debauche primarily serves as a CPUC technical expert on Noise and Transportation/Traffic issues. Additionally, Mr. Debauche is serving as CPUC's senior helicopter construction expert. His project experience with the CPUC includes the following:

- **Coolwater Lugo Transmission Project, Riverside and San Bernardino Counties, CA.** Southern California Edison's (SCE) 75-miles of new 500 kilovolt (kV) transmission line, construction of the new Desert View Substation southeast of Apple Valley, upgrades to the Coolwater Substation and Lugo Substation, and construction of approximately 35 miles of new telecommunications cable on new and existing poles.
- **West of Devers Transmission Project, Riverside and San Bernardino Counties, CA.** SCE will consist remove and replace approximately 48 miles of existing 220 kV transmission lines with new double-circuit 220 kV transmission lines, between the existing Devers Substation (near Palm Springs), Vista Substation (in Grand Terrace), and San Bernardino Substation.
- **Tehachapi Renewable Transmission Project (TRTP Segments 4 through 11), Kern, Los Angeles, and San Bernardino Counties, CA**. SCE's 173-miles (of which 42-miles traversed US Forest Service lands) of new and upgraded 500 kV electric transmission lines and substations to deliver electricity generated from new wind energy projects in eastern Kern County.
- **Devers–Palo Verde No.2 (DPV2) Transmission Line Project, Riverside and San Bernardino Counties, CA**. 230-miles of new and upgraded 500 kV and 230 kV transmission line and substations from the Palo Verde Nuclear power plant in Arizona to the western San Bernardino County area of California. This transmission line originally analyzed 126-miles within California and 106-miles within Arizona (with the line traversing BLM and USFS lands in both California and Arizona).
- **Sunrise Powerlink Project, San Diego and Imperial Counties, CA.** Built and operated by San Diego Gas and Electric (SDG&E), the Sunrise Powerlink was the largest infrastructure project constructed by helicopters in the United States, the construction of 117-miles of 500 kV transmission line (429 total structures with 387 towers constructed by helicopter) and substations through multiple jurisdictions of rural and urban mountainous terrain.
- **Antelope-Pardee Transmission Line Project (TRTP Segment 1), Los Angeles County, CA.** SCE's 25-mile 500 kV transmission line project from the Antelope Substation in the City of Lancaster, through the Angeles National Forest (USFS lands), and terminating at SCE's Pardee Substation in Santa Clarita.
- **Antelope Transmission Line Project (TRTP Segments 2 & 3), Los Angeles and Kern Counties, CA.** Prepared the Noise analysis for SCE's 60-miles of 220 kV and 500 kV transmission line project, which connects the Tehachapi Wind Resource Area in southern Kern County to SCE's Vincent Substation in Los Angeles County.
- **El Casco System Project, Riverside County, CA.** SCE's 115 kV subtransmission line from Banning Substation westward toward the new El Casco Substation.
- **Downs Substation Project, Kern County, CA.** Upgrades to the existing SCE operated Downs Substation and 55-miles of 220 kV transmission line and fiber optic line upgrades.
- **Indian Springs Telecom Project, Shasta County, CA.** The construction of cell towers, underground 66 kV subtransmission line, equipment buildings, and access roads, which would provide cellular

communications service to residents and commuters within the coverage area of Hatchet Mountain, Round Mountain, and Bear Mountain.

- **Viejo System Project, Orange County, CA.** Construction of the new Viejo Substation, installation of a new 66 kV subtransmission line, and replacement of 19 transmission structures.
- **Looking Glass Networks Fiber Optic Cable Project, Northern and Southern California.** Fiber optic line upgrades in the San Francisco Bay Area and the Los Angeles Basin Area.

Western Area Power Administration (Western), Desert Southwest and Sierra Nevada Regions, Arizona and California. Aspen, as on-call contractor for these Western regions, evaluates the environmental and engineering aspects of new transmission line facilities and operation and maintenance (O&M) activities throughout the Region. As part of this effort, Mr. Debauche works as a senior NEPA and CEQA planner, as well as a technical specialist for Project Design/Construction issues. His project work has included:

- **San Luis Transmission Line Project, Alameda, Contra Costa, San Joaquin, Stanislaus, Merced, and Fresno Counties, CA.** Construction of 62-miles of new 500 kV and 230 kV transmission line between Western's Tracy Substation and Pacific Gas and Electric's (PG&E) Los Banos Substation.
- **Gila to North Gila 230 kV Transmission Line Rebuild and Upgrade Project, Yuma, Arizona.** Mr. Debauche is preparing the Project Description and conducting the Noise and Visual Resources analysis for this project, where the proposed action is to rebuild six miles of the existing Western NGA-GLA line to 230kV w/ 69 kV underbuild and provide an outgrant to Arizona Power Supply (APS) to expand the shared ROW; connected action is construction and operation of the APS North Gila-TS8 project.
- **Mead-Liberty 230 kV Transmission Line Vegetation and Access Road Management, Maricopa County, Arizona**. Prepared the BLM Visual Resource Management (VRM) background memo for this O&M activity along 15-miles of existing Western transmission line ROW.
- **Prescott-Pinnacle Peak 230 kV Transmission Line Vegetation and Access Road Management, Yavapai and Maricopa Counties, Arizona.** Prepared the BLM VRM background memo and contrast rating analysis for this O&M activity along 32-miles of existing Western transmission line ROW.
- **Transmission Agency of Northern California (TANC) Transmission Project, Northern California Counties.** As the designated Technical Specialist in charge of Transportation/Traffic and Socioeconomics analyses, prepared the associated sections of the Scoping Report for new and upgraded 500 kV and 230 kV transmission lines, substations, and related facilities generally extending from northeastern California near Ravendale in Lassen County to the California Central Valley through Sacramento and Contra Costa Counties and westward into the San Francisco Bay Area. The project was canceled in July 2009.

Additional Energy Planning, Power Generation, and Transmission Projects

Mr. Debauche has served various State and local agencies as a senior environmental analyst for NEPA/CEQA compliance and other technical review of the following projects:

- **Renewable Energy Streamlining Program General Plan Element, San Luis Obispo County, CA.** As a senior technical specialist, Mr. Debauche is preparing various aspects of the renewable energy opportunities and constraints technical study, including the economic and socioeconomic evaluation. The opportunities and constraints study is evaluating the current and potential renewable energy industry jobs and investment within San Luis Obispo County and the renewable energy industry's current and potential economic role in the region. Upon completion of the opportunities and constraints study, countywide policies will be development to support the renewable energy industry by generation technology and associated CEQA analyses for new General Plan updates intended to streamline future renewable energy project development within San Luis Obispo County.

- **Renewable Energy Streamlining Program General Plan Element, San Bernardino County, CA.** The work being completed for San Bernardino County under the streamlining program is similar to that described above for San Luis Obispo County. Of particular focus within the San Bernardino County study area is the large extent of potential solar development.
- **Renewable Energy Streamlining Program General Plan Element, Inyo County, CA.** The work being completed for Inyo County under the streamlining program is similar to that described above for San Luis Obispo County. Of particular focus within the Inyo County study area is the large extent of BLM land within the County boundary.
- **Diablo Canyon Nuclear Power Plant (DCPP) Steam Generator Replacement Project, San Luis Obispo County, CA.** Replacement of the eight original steam generators due to degradation from stress and corrosion cracking. The DCPP facility occupies 760 acres within PG&E's 12,000-acre owner-controlled land on the California coast.
- **Alta East Wind Project, Kern County, CA.** The commercial production of up to 360 MW of electricity from up to 120 wind turbine generators, their ancillary facilities, and approximately 20 miles of supporting transmission line infrastructure located on both Kern County and BLM lands.
- **Topaz Solar Project, San Luis Obispo County, CA.** 500 MW solar PV generating facility and transmission line interconnections.
- **Desert Sunlight Solar Farm Project, Riverside County, CA.** 550 MW solar PV and associated transmission line interconnection to facilitate the construction of the Red Bluff Substation.
- **Panoche Valley Solar Farm, San Benito County, CA.** 420 MW solar PV project located on approximately 4,885 acres.
- **Alta Wind Project, Kern County, CA.** 800 MW winder energy facility consisting of up to 350 wind turbine generators and approximately 20 miles of supporting transmission line infrastructure on 10,750 acres.
- **Tule Wind Energy Project, San Diego County, CA.** Conducted a third party BLM review of the CPUC prepared environmental analysis of the proposed 220 MW wind energy facility, new East County Substation, and transmission line interconnections.
- **California Valley Solar Ranch, San Luis Obispo County, CA.** 250 MW solar PV electrical generating facility and transmission line interconnections.
- **Pacific Wind Project, Kern County, CA.** 250 MW wind energy facility and supporting transmission line interconnections.
- **Liberty Energy Power Plant, Riverside County, CA.** Construction of a new biomass power plant, which includes three power generation units to produce 17.5 MW of electricity utilizing a bubbling fluidized bed gasifier boiler to generate steam.
- **North Sky River/Jawbone Wind Project, Kern County, CA.** 87 MW wind energy project and supporting transmission line interconnections.
- **Morgan Hills Wind Project, Kern County, CA.** 230 MW wind energy project and supporting transmission line interconnections on 3,773 acres.

- **South San Joaquin Irrigation District (SSJID) Sphere Plan and Municipal Services Program, San Joaquin County, CA.** The program allowed SSJID to expand its existing services to provide retail electric service throughout its southern San Joaquin County service territory, including the incorporated Cities of Manteca, Ripon, and Escalon, and the unincorporated areas within and contiguous to the SSJID service area boundaries.
- **Sunset Substation and Transmission and Distribution Project, Riverside County, CA.** Construction of the new Sunset Substation and supporting 20-miles of 33 kV transmission line that interconnects with the City of Banning's existing distribution system.
- **Colton Substation Project, Riverside County, CA.** 1.9-acre substation and supporting 1.7-miles of 69 kV subtransmission line with the existing City of Colton owned distribution systems.

Oil/Gas and Mining-Related Projects

Mr. Debauche has served various State and local agencies as a senior environmental analyst for NEPA/CEQA compliance and other technical review of the following projects:

- **Statewide Well Stimulation Treatments for Enhanced Oil and Gas Production and Recovery (Fracking) Regulations Under Senate Bill 4.** Under contract to the California Division of Oil, Gas, and Geothermal Resources (DOGGR), Mr. Debauche is part of a small team of specialists evaluating the environmental impacts and effectiveness of proposed rulemaking under Senate Bill 4 to establish permanent regulations to govern oil and gas well stimulation treatment throughout the State. This effort includes the preparation of a programmatic EIS/EIR for statewide well stimulation practice.
- **Santa Margarita Quarry Expansion Project, San Luis Obispo County, CA.** Expanding the existing surface mine (Santa Margarita Quarry) by adding an additional 41 acres to the existing entitled 85-acre mining footprint and buffer area. The project would result in the disturbance of approximately 126 acres on four parcels, totaling 369 acres in size. As proposed, the estimated duration of mining activities would be approximately 59 years with an additional 5 years to complete the proposed reclamation plan.
- **Los Angeles County Baldwin Hills Oil Field Community Standards District Ordinance Preparation, Los Angeles County, CA.** Served as the City of Culver City Technical Specialist and expert witness reviewing the Los Angeles County Baldwin Hills Oils Field Community Standards District Noise analysis and policy mechanisms which guided the expansion and future operations of the existing Baldwin Hills oil field. Upon completion of environmental review, Mr. Debauche then prepared the Noise section of the newly enacted City of Culver City Community Standards District overlay zone restricting noise generation by the Baldwin Hills Oil Field on the residents of Culver City.
- **CleanTech CleanTech Hazardous Waste Treatment Facility Permit, Irwindale, CA**. Mr. Debauche evaluated the collection and testing of used oil from offsite generators (gas stations, oil changers, auto repair shops, etc.), which is then filtered and treated by blending, gravity separation, and by adding a chemical reagent if necessary, to remove metals and enhance dehydration, to meet the recycled oil standards. The Project's proposed maximum monthly used oil throughput is 1,500,000 gallons, or approximately 5,625 tons per month.
- **Port of Long Beach Eagle Rock Terminal Project, Los Angeles County, CA.** Under contract to the Port of Long Beach (in cooperation with the Army Corps of Engineers), prepared the Transportation/Traffic analyses for the proposed construction and operation of a sand, gravel and granite aggregate receiving, storage and distribution terminal to be located at the Port of Long Beach.

- **Port of Long Beach Liquid Natural Gas (LNG) Import Project, Los Angeles County, CA.** Under contract to the City of Long Beach, Mr. Debauche reviewed the Army Corps of Engineers prepared Transportation/Traffic and Noise analyses for the proposed construction and operation of this onshore LNG facility to be located at the Port of Long Beach.

Water Resource Projects

Mr. Debauche has served various federal, State and local agencies as a senior environmental analyst for NEPA/CEQA compliance and other technical review of the following projects:

- **Littlerock Reservoir Sediment Removal Project, Los Angles County, CA.** Construction of a grade control structure upstream of the reservoir impoundment and removing 1,000,000 cubic yards of sediment upstream of Palmdale Water District's Littlerock Dam located on USFS lands.
- **Lake Gregory Dam Rehabilitation Project, San Bernardino County, CA.** Dam stabilization including the removal of existing rock on the downstream slope, removal of foundation material at the base of the dam, and construction of a new 25-foot average thickness earthen buttress extending beyond the current toe of the embankment, installation of a drainage system to pick up water moving through the liquefaction zone, and placement of new slope protection.
- **Thousand Palms Flood Control Project, Riverside County, CA.** Flood control project, which will create 20-miles of flood control structures and drainage systems protecting newly developed hillside residential development within the Coachella Valley Municipal Water District.
- **Rimforest Storm Drain Project, San Bernardino County, CA.** For the County of San Bernardino, Department of Public Works, this project included the construction and maintenance of an over 10-mile series of flood control facilities in the community of Rimforest, to address historic erosion and landslide problems that have led to significant property loss. The new facilities divert runoff from its current flow-path into new channels and pipeline into Little Bear Creek
- **Donnell Basin Flood Control Project, San Bernardino County, CA.** For the County of San Bernardino, Department of Public Works, this project included the construction and maintenance of a series of improvements to the existing Donnell Basin in order to increase its capacity and provide flood hazard protection to downstream areas. The project also includes improvements to the existing road crossing at Split Rock Avenue, east of the basin, in order to accommodate increased capacity of the basin.
- **Monterey Bay Aquarium Research Institute MARS EIS/EIR, San Francisco County.** Prepared the Socioeconomics/Environmental Justice analysis for the installation and operation of the Monterey Monterey Accelerated Research System (MARS) Cabled Observatory within the Pacific Ocean that provides a continuous monitoring presence in the Monterey Bay National Marine Sanctuary (MBNMS) as well as serving as the test bed for a state-of-the-art regional ocean observatory. Traversing BLM jurisdictional coastal resources, the project required extensive Environmental Justice analysis evaluating the potential for any direct or indirect disproportionate impacts to fisheries workers.

US Army Corps of Engineers. Responsible for conducting environmental planning (NEPA and CEQA) as part of two environmental services contracts. Projects included:

- **Northeast Phoenix Drainage Area Alternatives Analysis Report, Phoenix and Scottsdale, Arizona.** Channel and detention basin alternatives to control flooding problems resulting from fast rate of development in the northeast Phoenix area.
- **Prado Basin/Norco Bluffs/Reach 9 of the Santa Ana River Dikes, Riverside County, CA.** Three separate analyses for the 25-mile Norco Bluffs Toe Stabilization project.

- **Murrieta Creek Flood Control and Environmental Restoration Project, Riverside County, CA.** Flood control and restoration project.

California Department of Water Resources. Responsible for conducting environmental (CEQA) and facility planning as part of two environmental services contracts. Projects included:

- **Pyramid Lake Repairs and Improvements Project, Los Angeles County, CA.** For DWR and the Department of Boating and Waterways (DBW) repairs and improvements at various recreational sites at Pyramid Lake.
- **Piru Creek Stabilization and Restoration Project, Los Angeles County, CA.** Erosion damage repairs at a series of three locations downstream of Pyramid Dam and seismically retrofit the Pyramid Dam access bridge that crosses Piru Creek.

Los Angeles Department of Water and Power (LADWP). Under Aspen's environmental services contract with the City of Los Angeles Department of Water and Power (LADWP) between 2005 and 2008, Mr. Debauche was responsible for conducting environmental planning (CEQA) and siting analyses for a variety of projects, which included:

- **River Supply Conduit (RSC) Upper Reach Project, Los Angeles County, CA.** Major potable water transmission pipeline from the Los Angeles Reservoir Complex and local ground water wells to reservoirs and distribution facilities located in the central areas within of the City of Los Angeles.
- **DC Electrode Project, Los Angeles County, CA.** Prepared the Noise, Air Quality, Geology and Soils, Population and Housing, and Utilities/Service Systems analyses for this new electrode distribution line from West Los Angeles to the Pacific Ocean stopping point in Malibu up the Pacific Coast Highway and extending into the Pacific Ocean.
- **Taylor Yard Water Recycling Project, Los Angeles County, CA.** Recycled water pipeline to provide recycled water produced by the Los Angeles–Glendale Water Reclamation Plant to the Taylor Yard distribution facility.
- **Mulholland Pumping Station and Lower Hollywood Reservoir Outlet Chlorination Station Project, Los Angeles County, CA.** Replacement of the existing historic pumping/chlorination station building as well as the existing water quality laboratory buildings with a new single structure pumping/chlorination station within the LADWP's Hollywood Reservoir Complex located in the Hollywood Hills.
- **District Cooling Plant Project, Los Angeles County, CA.** Pipeline to provide a centralized system for producing chilled water for use by area users, which are generally large commercial, governmental, industrial and institutional buildings who generate their own chilled water utilizing individual chiller plants for space cooling and air-conditioning.

Ventura County Watershed Protection District. Under Aspen's existing environmental services contract, Mr. Debauche is responsible for conducting environmental planning and review under CEQA. Projects included:

- **Lake Canyon Dam and Detention Basin Project, Ventura County, CA.** Earthfill dam and detention basin to detain peak storm flows and capture debris expected from a 100-year storm event.
- **San Antonio Creek Giant Reed Removal Project, Ventura County, CA.** Project removed the giant reed invasive plant species within the upper reaches of the San Antonio Creek watershed and several tributaries to ensure flood control protection to adjacent residential areas.
- **California River Parkways Trailhead, Ventura County, CA**. Project included a new point of entry to the Ventura County-maintained Ojai Valley Trail (OVT) and the City of Ventura-maintained Ventura River Trail (VRT).

- **Sespe Creek Levee Improvement Project, Ventura County, CA.** Project provided improvements along the SC-2 Levee, a 1.1-mile section of the Sespe Creek flood control system.

Urban Projects

- **Avila Point Project, San Luis Obispo County, CA.** Under contract to San Luis Obispo County, Mr. Debauche is evaluating the urban design and conducing environmental analysis under CEQA for the remediation of an exhausted Chevron oil tank farm, rezoning the property from industrial to recreation, and construction of a resort to include a restaurant, spa, shops, cottages, hotel rooms and related facilities.
- **City of Los Angeles Economics Specialist, Los Angeles, CA.** Mr. Debauche serves as a prequalified socioeconomic specialist to the City of Los Angeles. Typical assignments include the socioeconomic review of development projects and funding mechanisms intended to stimulate economic growth within the city.
- **706 Mission Residential Tower Project, City of San Francisco, CA.** The construction of a new 47-story, 550-foot-tall building (including three floors below grade) at the corner of 3rd Street and Mission Street in San Francisco's Financial District. The project required a detailed noise analysis and policy review to ensure project compliance with the City of San Francisco noise ordinance performance standards within the CEQA analysis (EIR).
- **Big Sandy Rancheria Casino Project, Fresno County, CA.** Under contract to the Bureau of Indian Affairs, Mr. Debauche conducted a third party review of the County prepared NEPA environmental analysis and provided comments and expert witness testimony pertaining to the proposed mitigation requiring major roadway improvements.

Los Angeles Unified School District (LAUSD), Los Angeles County, CA. As part of Aspen's services contract with the LAUSD, Mr. Debauche served as a technical senior ensuring siting and environmental compliance (CEQA) for school expansion and new school construction projects that would meet existing overcrowded conditions in the greater Los Angeles area. Projects included:

- **New School Construction Program.** LAUSD 2020 Program, which provided student seats throughout the LAUSD via a combination of the addition of portable classrooms to existing campuses, modernization and reconfiguration of existing campuses, and the construction of new schools.
- **East Valley Middle School No. 2.** Major issues of concern included traffic and noise generated by school operation activities.
- **Mt. Washington Elementary School Multi-Purpose Room Addition Project.** Development of a multi-purpose room facility, including a library, auditorium, and theater, to the existing Mt. Washington Elementary School campus located in Los Angeles.
- **Canoga Park New Elementary School.** Elementary school project proposed to be developed on a parcel of land owned by the non-profit organization, New Economics For Women (NEW). This "turn-key" project consisted of a Charter Elementary School to be developed by NEW and sold to the LAUSD for operation.
- **Hughes Magnet Span School.** Re-opening of the existing Hughes Middle School as a Magnet Span School serving up to 1,620 District 6th though 12th grade students.
- **Wonderland Elementary School Portable Classroom Additions.** Issues of concern included Noise to nearby residential receptors.

- **Pio Pico Elementary School Playground Expansion.** Expansion of a playground at the existing Pio Pico School Elementary School. The playground was proposed on five residential properties. One of the residences was a significant historical property that required detailed coordination for purchase.
- **Fairfax Senior High School Portable Classroom Addition.** Major issue areas covered were Transportation/Traffic, Air Quality, Land Use, and Noise.
- **Polytechnic Senior High School Portable Classroom Addition**. Addition of portable classrooms at the school.
- **Washington Senior High School Portable Classroom Addition**. Addition of portable classrooms at the school.

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Environmental Analysis under NEPA and CEQA

- **Metropolitan Transit Agency (MTA) Mid Cities/Westside Transit Corridor Study, Los Angeles County, CA.** Three-phase major transportation planning study (including the Major Investment Study (MIS), NEPA and CEQA compliance (EIS/EIR), and an evaluation of the urban design implications of transit interventions on selected routes intended to address current and long range traffic congestion in the central and westside areas of the Los Angeles Basin. Three east/west corridors and a range of transit alternatives ranging including Rapid Bus, light rail, and heavy rail were evaluated.
- **Pacific Gas and Electric (PG&E) Proposed Divestiture of Hydroelectric Assets Project, California.** Analyzed the proposed sale of PG&E hydroelectric assets also included approximately 140,000 acres of land proposed for sale with the hydroelectric system throughout California.
- **City of Santa Clarita Wes Thompson Ranch Development Project, Los Angeles County, CA.** Hillside residential development of over 150 luxury homes. Issues of concern included seismic and air quality impacts associated with the excavation of 2 million cubic yards of soil, the project's non-compliance with the City's hillside ordinance for innovative design, and traffic generated by project-related population growth in the area.
- **Cabrillo Plaza Redevelopment Project, Santa Barbara County, CA.** Mixed-use commercial development plan for Santa Barbara's waterfront on Cabrillo Boulevard. Proposed Specific Plan development included an aquarium, specialty retail, restaurants, and office space.
- **Culver City Redevelopment Plan and Merger, Los Angeles County, CA.** Evaluated the impacts of the City's redevelopment of 10 city blocks.
- **Dana Point Headlands Development Project, Orange County, CA.** Development of coastal bluff with hotel, single- and multi-family residential, and commercial uses.

City of Santa Monica Environmental Assessments. Under an environmental services contract with the City, was the lead technical planner for environmental compliance (CEQA) for housing, commercial, institutional, and mixed-use developments. Project included:

- **North Main St. Mixed-Use Development Project.** Evaluation of impacts resulting from the development of a mixed-use development in Santa Monica's "Commercial Corridor" on Main Street, with ground-floor residences and boutique commercial uses.
- **Santa Monica College Parking Structure B Replacement.** Addition of a 3-story parking structure in the center of the SMC campus.

- **Seaview Court Condominiums.** Prepared six technical reports including traffic, cultural resources, parking survey, shade and shadow analysis, and a geotechnical assessment to evaluate this proposed residential development in the waterfront area of Santa Monica.
- **Four-Story Hotel.** Analyzed this four-story hotel adjacent to St. John's Hospital in Santa Monica. Major issues of concern included project-generated traffic on surrounding multi-family residential uses and emergency access to the hospital.

Urban Design Specific Plans

- **Triangle Gateway Specific Plan, Los Angeles County, CA.** Under contract with the City of Beverly Hills, prepared key urban design and planning aspects of the Specific Plan to revitalize the triangle gateway commercial area of Beverly Hills. The Specific Plan included converting commercial only buildings to commercial/residential loft spaces, improvements to public transportation stops, lighting and façade improvements, and long-term plan to commercial development.
- **UC Merced Specific Plan, Merced County, CA.** Under contract to the University of California, prepared key urban design and planning aspects for the new UC Merced campus. Features included planning and design of transportation/traffic flow, external lighting and seating areas, and overall campus design.
- **UCLA Campus Housing Specific Plan, Los Angeles County, CA.** Under contract to the University of California, prepared key urban design and planning aspects for the UCLA campus housing expansion and new facility long-term plan. Features included planning and design of public transportation access, external lighting and seating areas, and overall future housing locations.
- **Cabrillo Plaza Specific Plan, Santa Barbara, CA.** Under contract to the city of Santa Barbara, prepared key urban design elements of a proposed aquarium and commercial plaza within the waterfront portion of downtown Santa Barbara.
- **Dana Point Headlands Specific Plan, Orange County, CA.** Prepared urban design elements of this specific plan providing for development of coastal bluff with hotel, single- and multi-family residential, and commercial uses.

CH2M Hill, Minneapolis, MN... 1995-1998

- **Minneapolis/St. Paul International Airport Expansion Project, Federal Aviation Administration.** Mr. Debauche was a key writer of the $4 million New Airport Evaluation Study, which included evaluating the urban design implications and long-term effects on the Cities of Minneapolis and St. Paul with regards to either expanding the existing Minneapolis/St. Paul International Airport or constructing a new international airport outside of the city limits. Upon selection of expanding the existing airport, the NEPA compliance document (EIS) evaluated the $800 million expansion of the existing MSP International airport, including transit and terminal modifications and the inclusion of a new perpendicular runaway. In addition to preparing several key technical issue area chapters of this comprehensive EIS, Mr. Debauche was critical in preparation of a technical report on airport noise effects on nearby housing and mitigation programs for the impacts of the proposed new perpendicular runway.
- **Minneapolis/St. Paul Wastewater Treatment Facility Expansion Project, Metropolitan Council Environmental Services.** Mr. Debauche was a key writer of the NEPA document (EIS) for a $700 million expansion of the existing wastewater treatment facility serving the Twin Cities area, which included nearly doubling the facility capacity to serve the projected long-term needs of the cities of Minneapolis and St. Paul. Mr. Debauche prepared several issue area chapters of this comprehensive EIS, including the Traffic and Noise analyses.

DECLARATION OF
Jonathan Fong

I, **Jonathan Fong,** declare as follows:

1. I am presently employed by the California Energy Commission in the Environmental Office of 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 on **Traffic and Transportation** for the **Huntington Beach Energy Project Final Staff Assessment,** based on my independent analysis of the Application for Certification and supplement hereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: 4/17/2014 Signed:

At: Sacramento, California

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
Mark Hesters

I, **Mark Hesters,** 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 Engineering Geologist.

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 **Huntington Beach Energy Project Final Staff Assessment,** based on my independent analysis of the Application for Certification and supplement hereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: 8/13/14 Signed:

At: Sacramento, California

Mark Hesters
Associate Electrical Engineer

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

DECLARATION OF
Jeanine Hinde

I, **Jeanine Hinde,** 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 Engineering Geologist.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I prepared the staff testimony on **Visual Resources** for the **Huntington Beach Energy Project Final Staff Assessment,** based on my independent analysis of the Application for Certification and supplement hereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: May 13, 2014 Signed: Jeanine Hinde

At: Sacramento, California

JEANINE M. HINDE

Professional Experience

Planner II **February 2010–Present**
California Energy Commission, Sacramento, CA
Environmental Office of the Siting, Transmission, and Environmental Protection Division

Generalist skilled in research and analysis and preparing environmental assessments for siting of a variety of power plant projects filed with the Energy Commission. Analyzes project-related impacts on land use, agricultural resources, and visual resources. Evaluates project conformance with applicable laws, ordinances, regulations, and standards. Preparing the visual resources analysis for the Huntington Beach Energy Project, a 939-MW natural gas-fired plant that is proposed to replace the AES Huntington Beach Generating Station. Preparing the alternatives analysis for a project proposed to amend the previously approved 500-MW Palen Solar Power Project and change the technology from one renewable solar thermal technology to another. Prepared the alternatives analysis for a proposed 500-MW solar power tower project in the eastern Mojave Desert. Prepared the land use analyses for a 159-MW geothermal power plant in Imperial County and a 174-MW electrical generating plant in Ceres.

Environmental Analyst and Project Coordinator **2004–2009**
EDAW-AECOM, Sacramento, CA

Coordinated preparation of environmental studies to satisfy the California Environmental Quality Act (CEQA) and the National Environmental Policy Act and related permitting and regulatory requirements. Contributed to the preparation of regulatory compliance documents for projects addressing flood protection, wastewater management, water quality, habitat restoration, and urban development. As an assistant project manager, contributed to the preparation, technical review, and distribution of a variety of environmental compliance documents for projects that included a levee repair project on the Feather and Yuba Rivers, a levee seepage project on the San Joaquin River near the Sacramento-San Joaquin Delta (Delta), a wastewater treatment plant improvement project in Atwater, and a habitat restoration project adjacent to the middle Sacramento River. As an analyst, prepared environmental impact analyses for resource topics that included land use; agricultural resources; visual/aesthetic resources; public services, utilities and service systems; hazardous materials; recreation; and geology, soils, and mineral resources. Prepared mitigation monitoring and reporting program documents and assisted with fulfilling CEQA noticing and filing requirements.

Environmental Analyst, Independent Consultant **2003–2004**
Sackheim Consulting, Fair Oaks, CA

Researched and wrote the aesthetics analyses for the CEQA documents on related neighborhood electrical distribution projects in the Natomas and Elkhorn areas of Sacramento. Prepared a similar analysis for a project in Elk Grove. Assisted with the analyses addressing potential impacts on cultural resources and issues related to hazards and hazardous materials.

Environmental Specialist II **1986–1997**
Jones & Stokes Associates, Sacramento, CA

Evaluated impacts on land use, visual resources, and recreation for several state and federal projects, including a water supply management program in the East Bay, a project addressing long-term management of resources in the Delta and Suisun Marsh, and a military operations project at Camp Roberts. Provided technical review and coordinated preparation of report sections prepared by staff, and assisted with research and documentation of required federal, state, and local permits and approvals for inclusion in regulatory compliance plans.

Education

B.A. Geography, California State University, Chico

DECLARATION OF
TAO JIANG

I, **TAO JIANG,** 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 an Air Resources 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 **Air Quality, Plume Velocity Analysis, and Nitrogen Deposition Analysis** for the **Huntington Beach Energy Project Final Staff Assessment,** based on my independent analysis of the Application for Certification and supplement hereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: Tao Jiang Signed: 05/12/2014

At: Sacramento, California

Tao Jiang, Ph.D.

Professional Experience

Air Resources Engineer ***(Jan. 2009 – Present)***

California Energy Commission, Siting Transmission and Environmental Protection Division

Currently acting as air quality technical staff on Siting projects filed with the Energy Commission including Abengoa Mojave Solar, Ridgecrest Solar Millennium and Almond 2 Power Plant, and compliance projects including 42 power plants in construction and operation. Specific responsibilities include the following:

- Analyze the impacts of the construction and operation of large power generation projects on air quality, Green House Gas and climate change
- Determine the conformance to applicable U.S. EPA, CARB and local air district regulations and standards
- Investigate and recommend appropriate emission mitigation measures
- Prepare air quality staff assessments and technical testimony
- Develop and monitor air quality compliance plans
- Review and evaluate U.S. EPA, CARB, and local air district air quality rules and regulations
- Collect, analyze and evaluate data for the effects of air pollutants and power plant emissions on human health, vegetation, wildlife, water resources and the environment
- Develop, recommend, and implement statewide planning and policy initiatives for the Energy Commission and Governor

Research Assistant ***(Sep. 2004 – Dec. 2008)***

University of California, Riverside, Chemical & Environmental Engineering

- Investigated phase behavior of air colloidal particles
- Study mediated colloidal interactions in the air particle dispersions
- Construct and evaluate models for gas molecules and air particulate matters
- Perform computer simulation and modeling for gas molecules and air particulate matters

Education

PhD	Chemical & Environmental Engineering, University of California, Riverside (August, 2008)
ME	Materials Science and Engineering, Beijing University of Chemical Technology (June, 2003)
BE	Materials Science and Engineering, Beijing University of Chemical Technology (June, 2000)

DECLARATION OF
Steven Kerr

I, **Steven Kerr,** 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 Engineering Geologist.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I prepared the staff testimony on **Land Use** for the **Huntington Beach Energy Project Final Staff Assessment,** based on my independent analysis of the Application for Certification and supplement hereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: May 13, 2014 Signed: Steven Kerr

At: Sacramento, California

Steven Kerr

Professional Experience:

California Energy Commission Sacramento, CA
January 2012-Present *Planner II*

- Review power plant applications and amendments for 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:

2005-2006 California State Polytechnic University, San Luis Obispo, CA
Coursework toward MS in Public Policy

2000-2005 California State Polytechnic University, San Luis Obispo, CA
Bachelor of Science in City and Regional Planning

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 testimony on **Facility Design** for the **Huntington Beach Energy Project** based on my independent analysis of the Application for Certification and supplements thereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issues addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony, and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: April 28, 2014 Signed: Shahab Khoshmashrab

At: Sacramento, California

DECLARATION OF
SHAHAB KHOSHMASHRAB

I, **SHAHAB KHOSHMASHRAB**, declare as follows:

1. I am presently employed by the California Energy Commission in the **ENGINEERING OFFICE** of the 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 testimony on **Noise and Vibration** for the **Huntington Beach Energy Project** based on my independent analysis of the Application for Certification and supplements thereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issues addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony, and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: April 28, 2014   Signed: Shahab Khoshmashrab

At: Sacramento, California

DECLARATION OF
SHAHAB KHOSHMASHRAB

I, **SHAHAB KHOSHMASHRAB**, declare as follows:

1. I am presently employed by the California Energy Commission in the **ENGINEERING OFFICE** of the 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 testimony on **Power Plant Efficiency** for the **Huntington Beach Energy Project** based on my independent analysis of the Application for Certification and supplements thereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issues addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony, and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: April 28, 2014 Signed: Shahab Khoshmashrab

At: Sacramento, California

DECLARATION OF
SHAHAB KHOSHMASHRAB

I, **SHAHAB KHOSHMASHRAB**, declare as follows:

1. I am presently employed by the California Energy Commission in the **ENGINEERING OFFICE** of the 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 testimony on **Power Plant Reliability** for the **Huntington Beach Energy Project** based on my independent analysis of the Application for Certification and supplements thereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issues addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony, and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: April 28, 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
Jennifer Lancaster

I, **Jennifer Lancaster,** declare as follows:

1. I am presently employed by Aspen Environmental Group, consultant to the California Energy Commission's Engineering Office of the Siting, Transmission and Environmental Protection Division as an Associate Biologist.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I prepared the staff testimony on **Biological Resources** for the **Huntington Beach Energy Project Final Staff Assessment,** based on my independent analysis of the Application for Certification and supplement hereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: May 9, 2014 Signed: ______________

At: Agoura Hills, California

Jennifer Lancaster
Associate Biologist

Academic Background

MS, Biology, California State University, Northridge, 2005
BS, Biology, University of California, Riverside, 2002

Professional Experience

Ms. Lancaster has seven years of experience at Aspen Environmental Group preparing documents in compliance with the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA), as well as NEPA/CEQA joint documents. She is also experienced with supporting agency clients through the Section 7 process and compliance with the federal and California Endangered Species Acts, as well as participating in environmental policy working groups on behalf of agency clients. She has 13 years of experience in botanical and wildlife field surveys and report preparation. Her biological background includes native habitat restoration, rare plant field studies, laboratory analysis, experimental design, teaching, and logistical support for field surveys.

Aspen Environmental Group..2007-present

Select project experience at Aspen includes the following:

- **Huntington Beach Energy Project, California Energy Commission (CEC), Biologist (2013 – present).** Ms. Lancaster is contributing to the preparation of the biological resources impacts assessment for this 939 MW natural gas-fired power plant in coastal Orange County that will replace the existing Huntington Beach Generating Station. Important biological issues for this project include indirect impacts to nearby wetlands and preserves, including noise and vibration impacts to wildlife.
- **Alamitos Energy Center, CEC, Biologist (2014 – present).** Ms. Lancaster is preparing the biological resources impacts assessment for this 1,936 MW natural gas-fired power plant in Long Beach, CA that will replace the existing Alamitos Generating Station. Important biological issues for this project include indirect impacts to nearby wetlands and preserves, including noise and vibration impacts to listed birds and green sea turtles.
- **Rio Mesa Solar Electric Generating Facility, CEC, Biologist (2012-2013).** Ms. Lancaster assisted in the preparation of the biological resources analysis of the Staff Assessment for a 4,000-acre solar energy project in the Colorado Deserts, and conducted agency consultations and permitting in compliance with CDFW Lake and Streambed Authorization Agreement and Incidental Take Permit programs. The proposed project was cancelled by the developer in 2013.
- **Palmdale Hybrid Power Plant, CEC, Biologist (2009-2011).** Ms. Lancaster assisted in the preparation of the biological resources analysis for the Staff Assessment being prepared for a proposed 570-MW hybrid combined-cycle and solar thermal electrical generation facility and associated 35.6-mile transmission line. The proposed project would be located in the City of Palmdale and unincorporated Los Angeles County. Some of the key issues on this project included potential impacts to Mohave ground squirrel, desert tortoise, golden eagle, and Swainson's hawk.
- **Rice Solar Energy Project, CEC, Biologist (2009-2010).** Ms. Lancaster contributed to the biological resources analysis of the Staff Assessment that was prepared for this solar energy project proposed by Rice Solar Energy, LLC (a wholly owned subsidiary of SolarReserve, LLC). The proposed project would include a 150-MW solar generation facility consisting of up to 17,500 solar-tracking heliostats, a central tower, and associated infrastructure and appurtenant structures. The solar field site would be located on approximately 1,410 acres of privately owned land in eastern Riverside County. In

addition, a 10-mile 230-kV generator tie-line would be constructed to interconnect the project with Western Area Power Administration's existing Parker-Blythe transmission line. The new transmission line would traverse lands primarily under the jurisdiction of the Bureau of Land Management (BLM). The new transmission line would also require the construction of a new 4.6-mile access road, also largely located on BLM lands. Key issues include potential impacts to desert tortoise and golden eagle, and potential impacts to birds in general from the solar technology.

- **Calico Solar Project (formerly SES Solar One Project), CEC, Biologist (2009-2010).** Ms. Lancaster assisted with the preparation of the biological resources analysis for the Staff Assessment that was prepared for this solar energy project proposed by Calico Solar, LLC. The proposed project would be located in San Bernardino County and includes the construction and operation of an 850-MW Stirling engine solar generation facility, which would include approximately 34,000 SunCatcher solar dish Stirling systems on approximately 8,230 acres. Key issues included potential impacts to desert tortoise, Mojave fringe-toed lizard, Nelson's bighorn sheep, burrowing owl, golden eagle, and rare plants, as well as large-scale modifications to existing drainages and interference with regional wildlife movement.
- **Desert Renewable Energy Conservation Plan EIR/EIS, CEC, Biologist and Technical Assistant (2013-present).** Ms. Lancaster is preparing the analysis of biological resources impacts resulting from transmission line build-out outside of the Plan Area, extending north into the San Joaquin Valley, east into the Los Angeles Area and south into San Diego and Imperial counties. She is also providing technical editing and QA/QC review for various sections of the document.
- **Lake Gregory Dam Rehabilitation Project, San Bernardino County Special Districts Department, Deputy Project Manager (2014-present).** Ms. Lancaster is serving as Deputy Project Manager for this project. Lake Gregory is located in the San Bernardino Mountains approximately 14 miles north of the City of San Bernardino in the community of Crestline. The Lake Gregory Dam Rehabilitation Project consists of the construction of physical improvements to the dam, earthen material hauling and processing, relocation of utilities on Lake Drive, and interim traffic detour routes. Four project alternatives will be analyzed; the proposed project is the option approved by the State of California, Department of Water Resources, Division of Safety of Dams. Aspen is preparing an EIR, MMRP, and supporting technical studies.
- **Coolwater-Lugo Transmission Project, California Public Utilities Commission (CPUC), Biologist (2013-present).** Ms. Lancaster is preparing the analysis of impacts to biological resources for the EIR/EIS being prepared for this large, controversial transmission project that includes over 64 miles of 500/220-kV transmission line, the proposed Desert View Substation, upgrades at multiple existing substations, installation of fiber optic cable, and a microwave tower.
- **Downs Substation Expansion Project, CPUC, Biologist (2010-present).** Ms. Lancaster is reviewing mitigation compliance submittals and providing biological resources technical support during compliance monitoring for construction of this project, which includes the upgrade/expansion of the existing Downs Substation and new telecommunications lines on approximately 58 miles of existing 115-kV poles. Approximately 6 existing poles would need to be replaced to accommodate the telecommunications line.
- **San Luis Obispo Renewable Energy Streamlining Program (RESP), San Luis Obispo County, Biologist (2013-present).** Ms. Lancaster is leading the assessment of biological resources for this project. The RESP involves analyzing and mapping opportunities and constraints for renewable energy siting and revising County plans and policies to streamline development of appropriately sited renewable energy facilities.

- **Inyo County Renewable Energy General Plan Amendment, Inyo County, Biologist (2013-present).** The County of Inyo is amending its General Plan to include policies for Renewable Energy Development. Ms. Lancaster is leading the assessment of biological resources for the Opportunities and Constraints Technical Study in support of the General Plan amendment.
- **Santa Margarita Quarry Expansion Project, County of San Luis Obispo Department of Planning and Building, Biologist (2013 – Present).** Ms. Lancaster is preparing the biological resources analysis for the EIR being prepared for this mining expansion project.
- **Thousand Palms Flood Control Project Subsequent EIR/EIS, Riverside County (2011 – present).** Ms. Lancaster is preparing the biological resources analysis and associated reports for this Subsequent EIR/EIS for this proposed flood control improvement project located in the Thousand Palms area of Riverside County. The Coachella Valley Water District is the CEQA Lead Agency, and the Regulatory Division of the U.S. Army Corps of Engineers (USACE) is the NEPA Lead Agency. The proposed project includes a series of levees and channels to direct stormwater flows from the Indio Mountains away from developed areas and into an existing stormwater conveyance system, to protect community areas from flooding hazards. In addition to preparing the biological resources technical analysis for the EIR/EIS, Ms. Lancaster will be preparing the Biological Assessment and supporting the USACE with consultation with the US Fish and Wildlife Service under Section 7 of the federal Endangered Species Act.
- **Littlerock Reservoir Sediment Removal Project, Palmdale Water District/USFS, Biologist/Project Assistant (2008-present).** Ms. Lancaster is providing support to the Project Manager and assisting in the preparation of the biological resources section of this joint EIS/EIR evaluating the impacts of sediment removal alternatives for the Littlerock Reservoir and Dam on USFS Angeles National Forest (NEPA Lead Agency) lands in Los Angeles County. In addition, Ms. Lancaster provided biological monitoring during drilling activities associated with design of a grade control structure. The Palmdale Water District (PWD) (CEQA Lead Agency) proposes to remove approximately 540,000 cubic yards of sediment from the reservoir (behind the dam) and haul it to off-site commercial gravel pits located 6 miles north of the dam site in the community of Littlerock. The project involves impacts to the arroyo toad and least Bell’s vireo, extensive coordination with USFWS for a Section 7 consultation and CDFW for an Incidental Take Permit, incorporation of new Forest Service Plan updates and requirements into the analysis, and preparation of the Forest Service required BE/BA and MIS reports.
- **Desert Harvest Solar Project, BLM, Biologist (2011-2013).** Ms. Lancaster prepared the biological resources analyses of the EIS for a 150-MW solar photovoltaic facility that is proposed on 1,200 acres near Desert Center in Riverside County, California. In addition to the EIS, Ms. Lancaster prepared analyses and documentation to support consultation and permitting for compliance with the state and federal Endangered Species Acts and federal Bald and Golden Eagle Protection Act, in coordination with BLM, CDFG, and USFWS. Important biological resources issues include the threatened desert tortoise, golden eagle, and wildlife habitat connectivity.
- **Tehachapi Renewable Transmission Line Project, CPUC/US Forest Service (USFS), Biologist (2007-present).** Ms. Lancaster assisted with the preparation of the biological resources analysis for the joint EIR/EIS and the Biological Assessment under Section 7 of the federal ESA for this 500-kV transmission line proposed by Southern California Edison in support of wind energy projects. In addition, she prepared the Riparian Conservation Area (RCA) and Management Indicator Species (MIS) analyses required by the USFS for project impacts on the ANF. She is currently reviewing reports and providing biological resources technical support during compliance monitoring for construction of this project, including evaluation of proposed compensation lands and participating

in an interagency working group to develop solutions to allow construction during the bird breeding season while maintaining compliance with State and federal regulations protecting nesting birds. This transmission line is over 100 miles in length and two separate lines cross the Angeles National Forest. Some of the key issues on this project include potential impacts to least Bell's vireo, coastal California gnatcatcher, desert tortoise, arroyo toad, California condor, California spotted owl, and a host of Forest Service Sensitive plant species.

- **El Casco System Project, CPUC, Project Assistant (2007-2008).** Ms. Lancaster served as Project Assistant for the El Casco System Project EIR. She provided support to the Project Manager, provided technical review of the environmental analysis, coordinated the cumulative impacts analysis, completed various public participation activities during the review periods for the Draft EIR and Recirculated Draft EIR, and assisted in preparing the Final EIR and Recirculated Final EIR. The project is located in a rapidly growing area of northern Riverside County, which includes the Cities of Beaumont, Banning, and Calimesa.
- **Alta East Wind Project, Kern County, Biologist (2011-2013).** Ms. Lancaster prepared the biological resources analysis of the EIR/EIS for a proposed 300-MW wind energy generation facility in the Mojave region of Kern County. The NEPA Lead Agency was BLM. The proposed project included up to 120 wind turbine generators, a substation, transmission interconnection to the SCE Windhub Substation, access roads, and ancillary facilities. The project area comprises 3,200 acres, 2,083 acres of which are on BLM land three miles northwest of the unincorporated town of Mojave in southeastern Kern County, California. Key issues included potential impacts to birds and bats from the wind turbines as well as potential impacts to desert tortoise, Mohave ground squirrel, California condor, and golden eagle.
- **Environmental and Ecological Review of Solar and Wind Energy Site in Kern County (2011).** Ms. Lancaster prepared a review of potential biological resources and a fatal flaw analysis for a potential renewable energy development site in Kern County.
- **Alta-Oak Creek Mojave Supplement, Kern County, Biologist (2011).** Ms. Lancaster prepared the biological resources analysis of the SEIR for a proposed infill to the existing Alta Oak Cree-Mojave Project, a wind energy development in the Mojave region of Kern County. Key issues included potential impacts to birds and bats from the wind turbines as well as potential impacts to desert tortoise, Mohave ground squirrel, California condor, and golden eagle.
- **Morgan Hills Wind Energy Project, Kern County, Biologist (2011).** Ms. Lancaster prepared the biological resources analysis of the EIR for a proposed 230-MW wind energy generation facility in the Mojave region of Kern County. Key issues included potential impacts to birds and bats from the wind turbines as well as potential impacts to California condor and golden eagle.
- **North Sky River Wind Project and Jawbone Wind Energy Project, Kern County, Biologist (2010-2011).** Ms. Lancaster prepared the biological resources analysis of the EIR for a proposed 250-MW wind energy generation facility in the Mojave region of Kern County. Key issues included potential impacts to birds and bats from the wind turbines as well as potential impacts to desert tortoise, Mohave ground squirrel, California condor, and golden eagle.
- **Alta–Oak Creek Mojave Project, Kern County, Issue Area Coordinator (2008-2009).** Ms. Lancaster was Issue Area Coordinator for Natural Resources and prepared the biological resources analysis of this Initial Study and EIR evaluating a proposed 800 MW wind development in the Tehachapi Wind Resource Area. Key issues included potential impacts to birds and bats from the wind turbines as well as potential impacts to desert tortoise, California condor, Swainson's hawk, golden eagle, and Bakersfield cactus.

Los Angeles and Ventura Community College Districts 2005-2007

Biology Instructor. Ms. Lancaster taught undergraduate courses including biology for majors, biology for non-majors, and human anatomy.

National Park Service, Santa Monica Mountains 2002-2003

Biological Science Technician. Ms. Lancaster conducted invasive weed surveys in the Santa Monica Mountains. She also participated in a restoration project for the endangered sunflower *Pentachaeta lyonii* and assisted with an ongoing reptile and amphibian diversity monitoring program in the region.

Sedgwick Reserve, Santa Barbara County 2001

Restoration Intern. Ms. Lancaster created vegetation maps of the reserve, constructed and directed an on-site nursery for the propagation of native plants for restoration projects, assisted with an entomological survey on the reserve, and assisted with a black abalone survey at the K.S. Norris Rancho Marino Reserve in Cambria.

Selected Publications and Presentations

- Lancaster, J.R., P. Wilson, and R.E. Espinoza. 2006. Physiological benefits as precursors of sociality: why banded geckos band. *Animal Behaviour*, 72:199-207.
- Lancaster, J.R. and R.E. Espinoza. January 2005. *What good is grouping for geckos? Testing the benefits of aggregation in <u>Coleonyx variegatus</u>.* (poster). Society for Integrative and Comparative Biology, San Diego, California.

DECLARATION OF
Geoff Lesh

I, **Geoff Lesh,** 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 prepared the staff testimony on **Hazardous Materials Management**, and **Worker Safety / Fire Protection** for the **Huntington Beach Energy Project Final Staff Assessment,** based on my independent analysis of the Application for Certification and supplement hereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: Geoff Lesh Signed: May 2, 2014

At: Sacramento, California

Geoffrey Lesh, PE

WORK HISTORY

California Energy Commission   Senior Mechanical Engineer   2002 - Current

- Analyze siting permit applications for gas-fired and solar-thermal power plants in the technical areas of hazardous materials management, fire safety, security, and worker safety plans
- Provide written and oral expert witness testimony at commission hearings on power plant fire protection plans, risk assessments, and adequacy of local fire departments
- Recommend mitigations as needed
- Inspect power plants during construction and operational phases
- Investigate accident, fire, and hazardous materials incidents at power plants

Self-Employed   Independent Investor   2000 - 2002

- Wrote market analysis computer software

Read-Rite Corp   Wafer Engineering Manager   1994 - 2000

- Designed and developed wafer manufacturing processes for computer data storage systems. Managed team of engineers and technicians responsible for developing wet and dry chemical processes for manufacturing, including process and safety documentation
- Managed process and equipment selection for manufacturing processes
- Processes included vacuum processed metals and ceramics, grinding-polishing, plating, etching, encapsulation, process troubleshooting, and SPC reporting

Dastek Corp   (Komag Joint Venture Start-up) Wafer Engineering Manager   1992 - 1994

- Developed wafer processes for new-technology recording head for hard disk drives
- Managed team of engineers and technicians
- This position included start-up of wafer fab, including line layout, purchase, installation, and startup of new process equipment, etc.

Komag, Inc   Alloy Development Manager   1989 - 1992

- Developed new vacuum-deposited recording alloys
- Responsible for planning and carrying-out tests, designing experiments, analyzing results, managing test lab conducting materials characterizations
- Extensive process modeling, experiment design and data analysis

Verbatim Corp (Kodak)   Process Development Manager   1983 – 1989

- Mechanical/materials engineering for computer disk manufacturing, including product, process, and equipment including metal-ceramic-plastic processes for optical disk development
- Production processes included metal plating, metal evaporation, reactive sputtering, laser-based photolithography, injection molding
- Steering Committee Member, Center for Magnetic Recording Research, UC San Diego
- Steering Committee Member, Institute for Information Storage Technology, Santa Clara University

IBM Corp   Mechanical/Process Engineer   1977 - 1983

- Product development for photocopiers, semiconductors, and computer data tape-storage systems

EDUCATION

Stanford University, Master of Science Degree	Materials Science and Engineering
UC-Berkeley, Bachelor of Science Degree (Double Major)	Mechanical Engineering, Materials Science and Engineering
University of Santa Clara, Graduate Certificate	Magnetic Recording Engineering

PROFESSIONAL LICENSES and CERTIFICATIONS

Registered Professional Engineer, California (PE)	Mechanical	#M32576
	Fire Protection	#FP1827
	Metallurgical	#MT1940
Certified Safety Professional (CSP)	Board of Certified Safety Professionals	
Certified Fire Protection Specialist (CFPS)	Certified Fire Protection Specialist Board of NFPA	
Certified Fire and Explosion Investigator (CFEI)	Board of National Association of Fire Investigators	

OSHA 40-hr HAZWOPER Hazardous Materials Incident Training

PROFESSIONAL ASSOCIATIONS

American Society of Safety Engineers – Professional Member
Society of Fire Protection Engineers – Professional Member
National Fire Protection Association – Member
National Association of Fire Investigators – Member

PUBLICATIONS

All-Solid Lithium Electrodes with Mixed-Conductor Matrix, J. Electrocchem. Soc. 128, 725 (1981).
Proc. Symp. on Lithium Batteries, H.V. Venkatasetty, Ed., Electrochem Soc (1981), p. 467.

PATENTS

Method of Preparing Thermo-Magneto-Optic Recording Elements, US Patent# 4,892,634, (assigned to Eastman Kodak Co.)

DECLARATION OF
Felicia Miller

I, **Felicia Miller,** 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 Engineering Geologist.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I prepared the staff testimony on **Introduction, Project Description and Executive Sunmmary** for the **Huntington Beach Energy Project Final Staff Assessment,** based on my independent analysis of the Application for Certification and supplement hereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: 5/13/14 Signed: Felicia Miller

At: Sacramento, California

Felicia Miller

California Energy Commission
1516 Ninth Street, MS-15
Sacramento, California 95814
(916) 654-4640

Professional Experience

April 2007 to present — ***California Energy Commission – Planner III - Siting Project Manager***

Plan, organize, direct and manage the State regulatory process for electric generating plants from application through issuance of permit. Plan, organize and direct the efforts of 23 disciplinary environmental and engineering staff in actions related to the California Environmental Quality Act (CEQA) requirements. Recommend actions, policies and procedures affecting the project and commission program direction. Conduct public workshops and hearings related to proposed projects. I Compile, edit, and issue staff environmental assessments and other CEQA related documents.

2006-2007 — ***California State Parks***
Associate Parks & Recreation Specialist – Off Highway Vehicle Division/Prairie City Off-Highway Vehicle Park

Development of resources study to determine watershed and hydrology, soil taxonomy and geology of State park. Lead on assessment and recommendations for watershed remediation and sediment control project. Climate prediction study to determine weather and hydrology patterns of park over a 25-year period. Research analysis for master and general plan update for district off highway vehicle parks.

2005-2006 — ***California State Department of Mental Health***
Senior Mental Health Specialist – Program Compliance

Program lead in Fingerprinting Analysis/Criminal Background Checks and Investigations Unit. Coordinated and directed assignments and deadlines for staff. Project lead in development of 2 new database programs used to automate data from fingerprint program and facility investigations. Unit coordinator for compilation, coordination and analysis of sections monthly measures and outcomes report, contributed significantly in eliminating CBC unit backlog. Lead investigator for mental health hospital incident investigations to determine regulatory compliance.

2000-2005 — ***California State Parks***
Associate Parks & Recreation Specialist – Grants and Local Services

Administration of park and recreation grants under State and Federal funding to local agencies in over 19 counties statewide and Bureau of Land Management. Provided technical assistance and interpretation of regulations and policy to local agencies, evaluate project status, billing support and documentation, and field inspections to determine compliance with project agreement. Team leader in development of program procedural guides including research of state and federal regulations, assignments coordination and participation at public hearings and coordinated assignments to meet critical deadlines. Development of program regulations and procedural guide, workshop lead.

1998-2000 ***California State Parks***
Personnel Services Specialist – Human Resources
Personnel and salary transaction functions for a roster of +400 district and HQ employees. Personnel contact with DPR employees for the purpose of responding to questions and dispensing accurate information to HQ and field timekeepers and employees. Contact with outside agencies for purpose of salary and payroll interpretation and processing. Translated bargaining unit contractual information to managers and employees and translated reference guidelines for laws and rules as set forth by DPA, SCO and SPB. Developed and initiated HQ new employee orientation and improved sign up procedures.

1997-1998 ***Department of the Youth Authority***
Public Service and Support Division
Analyzed and reconciled monthly reported from facilities and prepared monthly reimbursement claims to exceed $650K. Compiled data, analyzed and prepared intricate spreadsheets for monthly, quarterly and yearly accounting. Responsible for Mac training and support for division. Chair for United Way campaign.

1994-1997 ***Department of Fish and Game***
Office of Oil Spill Response-Scientific Division
Coordinated and prioritized assignments for division and supervised work of support staff. Coordination of interagency efforts as agency liaison during emergency response efforts during a coastline oil spill. Developed Operations Protocol manual for Incident Command Center and emergency response support team. Facilitated public surveys to determine economic value of recreation and natural resources and determine user trends.

1991-1994 ***John F. Kennedy High School***
Counseling & Curriculum Office
Using district graduation and special education requirements; planned, collected, evaluated and analyzed data from a variety of sources to develop a master schedule for educational programs; critical analysis of all phases of student programs to determine eligibility of curriculum prerequisites and high school graduation eligibility; translated high school graduation requirements and policy from district and inter-district transcripts to make curriculum recommendations, conducted curriculum training program to incoming students and parents, supervised team of student assistants. Program lead for targeted youth.

Education/Credentials

- Bachelor of Arts, Cum Laude, Sacramento State University in Communication Studies, concentration in Rhetorical Criticism
- California Real Estate Sales License, September 1999, license current

DECLARATION OF
Melissa Mourkas

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 Planner II, Cultural Resources.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I prepared the staff testimony on **Cultural Resources (Built Environment)** for the **Huntington Beach Energy Project Final Staff Assessment,** based on my independent analysis of the Application for Certification and supplement hereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: April 24, 2014 Signed: [signature]

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: <u>Landscape Architecture and Design</u>. 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: <u>Planner II</u>, 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: <u>Member</u>, City of Sacramento Preservation Commission (Chair 2013-2014)

2005 to 2008: <u>Assistant Planner</u>, 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
LAIPING NG

I, Laiping Ng declare as follows:

1. I am presently employed by the California Energy Commission in Strategic Transmission Planning Office of the Siting, Transmission & Environmental Protection Division as an Associate Electrical Engineer.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I helped prepare the staff testimony on Transmission System Engineering, for the Huntington Beach Energy Project Final Staff Assessment, based on my independent analysis of the Application for Certification and supplement hereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: 4/18/2014 Signed: Laiping Ng

At: Sacramento, California

Laiping Ng
Associate Electrical Engineer

Education:

Master of Science: Electrical Engineering - Power
California State University, Sacramento

Bachelor of Science: Electrical Engineering - Power
California State University, Sacramento

Power Certificate – EPRI

Experience:

April 1999 – Present:

- Review and evaluate electrical transmission system sections of the application to ensure that the transmission engineering aspects of the power plant, switchyards, substations, and the related facilities comply with applicable laws, ordinances, regulations, and standards (LORS).

- Prepare written analysis, which address the issues of the adequacy of proposed projects to meet applicable LORS.

- Perform load flow studies and fault analysis.

- Coordinate with CAISO, WSCC and other regulatory agencies and coordinate with utilities companies in the review and evaluation of the power plant siting process.

May 1991 – April 1999:

- Prepared engineering bid specifications for recommended lighting and HVAC projects. Evaluated contractor bids and recommended contractors to customers. Reviewed RFPs and RFQs. Evaluated, selected, and managed engineering consultants. Administrated and coordinated contracts.

- Designed electrical systems for indoor and outdoor lighting and lighting controls. Assisted in design cooling systems and controls for school buildings and office buildings. Reviewed and checked electrical lighting designs and drawings. Analyzed designs and made recommendations for effective actions.

- Performed facility energy audits and field surveys on schools, offices, hospitals and county jail facilities to identify energy efficiency improvements and cost estimate with respect to lighting and HVAC systems. Inspected lighting and HVAC system equipment installation.

- Worked in a Nonresidential Energy Efficiency Standards development team. Prepared and updated Standards concentrating on interior building illumination and indoor and outdoor flood lighting.

DECLARATION OF
Dr. Obed Odoemelam

I, **Obed Odoemelam,** 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 **Staff Toxicologist**.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I prepared the staff testimony on Transmission Line Safety and Nuisance for the **Huntington Beach Energy Project Final Staff Assessment,** based on my independent analysis of the Application for Certification and supplement hereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: Odoemelam Signed: 4/21/14

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
Wenjun Qian

I, **Wenjun Qian,** 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 an Air Resources 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 **Biological Resources Appendix Bio-A Nitrogen Deposition Analysis** for the **Huntington Beach Energy Project Final Staff Assessment,** based on my independent analysis of the Application for Certification and supplement hereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: 4/24/2014 Signed: [signature]

At: Sacramento, California

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

Professional Experience

Air Resources Engineer ***(July 2010 – Present)***
California Energy Commission, Siting Transmission and Environmental Protection Division

Currently acting as air quality technical staff on siting projects filed with the Energy Commission, including El Segundo, Russell City, Palomar, Oakley, Huntington Beach etc. Specific responsibilities include the following:

- Analyze the impacts of the construction and operation of large power generation projects on air quality, Green House Gas and climate change
- Determine the conformance to applicable U.S. EPA, ARB and local air district regulations and standards
- Investigate and recommend appropriate emission mitigation measures
- Prepare air quality staff assessments and technical testimony
- Develop and monitor air quality compliance plans
- Review and evaluate U.S. EPA, ARB, and local air district air quality rules and regulations
- Collect, analyze, and evaluate data for the effects of air pollutants and power plant emissions on human health and the environment
- Assist staff in other technical areas by evaluating nitrogen deposition, thermal plume, and visible plume impacts from power plants

Research Assistant ***(Sept. 2005 – June 2010)***
University of California, Riverside, Mechanical Engineering

- Evaluated air quality impact of distributed generations in South Coast Air Basin of California
- Estimated air quality impact from the key power plant of Los Angeles Department of Water and Power in shoreline urban areas
- Improved air quality model results by evaluation with experimental data
- Prepared and presented multiple comprehensive reports, journal papers, and conference papers

Education

PhD Mechanical Engineering, University of California, Riverside (August 2010)
MS Mechanical Engineering, George Washington University (August 2005)
BS Mechanical Engineering, Shanghai Jiao Tong University (June 2004)

DECLARATION OF
Gabriel Roark

I, **Gabriel Roark,** declare as follows:

1. I am presently employed by the California Energy Commission in the Environmental Office of the Siting, Transmission and Environmental Protection Division as an Energy Planner II.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I prepared the staff testimony on **Cultural Resources (archaeology)** for the **Huntington Beach Energy Project Final Staff Assessment,** based on my independent analysis of the Application for Certification and supplement hereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: May 13, 2014 Signed: Gabriel Roark

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

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

resource and business sectors, as well as to non-profit 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://csusdspace.calstate.edu/handle/10211.9/660, accessed April 24, 2014.

DECLARATION OF
Ellen Townsend-Hough

I, **Ellen Townsend-Hough,** 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 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 on **Waste Management** for the **Huntington Beach Energy Project Final Staff Assessment,** based on my independent analysis of the Application for Certification and supplement hereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: April 21, 2014 Signed: Ellen Townsend-Hough

At: Sacramento, California

Ellie Townsend-Hough, REA

(Registered Environmental Assessor, REA 1 – 05465)

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 Water Resources. I worked as a policy advisor to a California Energy Commissioner for three years. I am also an US Environmental Protection Agency Environmental Justice trainer.

PROFESSIONAL EXPERIENCE

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.

Technical Analysis and Presentation

- 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

- 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.

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
Negar Vahidi

I, **Negar Vahidi,** declare as follows:

1. I am presently employed by Aspen Environmental Group, a consultant to the California Energy Commission, Siting, Transmission and Environmental Protection Division, as a **Senior Project Manager/Senior Technical Specialist**.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I prepared the staff testimony on **Alternatives** for the **Huntington Beach Energy Project Final Staff Assessment,** based on my independent analysis of the Application for Certification and supplement hereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: Negar Vahidi Signed: May 9, 2014

At: Santa Monica, California

NEGAR VAHIDI

Senior Associate/Social Sciences Group Manager

Academic Background

Master of Public Administration, University of Southern California, 1993
BA (with Highest Honors), Political Science, University of California, Irvine, 1991

Professional Experience

Ms. Vahidi has over 18 years of experience managing and preparing a variety of federal, State, and local environmental, planning, and analytical documents for large-scale energy and water infrastructure and development projects. She currently serves as a Senior Project Manager and Aspen's Group Manager for land use, policy analysis, and socioecenomics issues. She brings the experience of being both a public and private sector planner, specializing in the integration and completion of NEPA and CEQA documentation, land use and public policy analyses, socioeconomics and environmental justice analyses, and public involvement programs. Her diversity and experience in management and technical analyses can be shown through a sample of her projects described below.

Aspen Environmental Group... 1992-1998 and 2001-present

Ms. Vahidi has participated in CEQA and NEPA analyses of major utility development projects throughout the State, providing land use, agriculture, public policy, and socioeconomics expertise as well as managing Public Participation Programs. Her specific projects are described below.

RENEWABLE ENERGY PLANNING PROJECTS

- **San Luis Obispo County Renewable Energy Streamlining Program and EIR.** Project Manager for Aspen (under contract to PMC). Aspen is working collaboratively with PMC and the County by preparing an Opportunities and Constraints Technical Study (OCTS) to determine Renewable Energy Development Areas (REDAs) suitable for siting of small-scale renewable energy (RE) in the County. The OCTS is intended to inform the County in developing it's renewable energy policy updates, its RE Combining Designation for its Open Space Element, and development and adoption of its RE Ordinance. This process has been funded by the CEC Renewable Energy Planning Grant Program. SLO County was one of five counties awarded a grant.
- **Inyo County Renewable Energy General Plan Amendment and Program EIR.** Senior Technical Adviser and Senior Socioeconomics Technical Expert for Aspen's contract with Helix. Aspen is working collaboratively with the County by preparing an OCTS to determine Renewable Energy Development Areas (REDAs) suitable for siting of renewable energy (RE) in the County. The OCTS is intended to inform the County in developing its renewable energy policy updates for its General Plan Amendment. This process has been funded by the CEC Renewable Energy Planning Grant Program. Inyo County was one of five counties awarded a grant.
- **San Bernardino County General Plan Renewable Energy Element and Program EIR.** Project Manager for Aspen (under contract to PMC). Aspen is working collaboratively with PMC and the County to develop renewable energy case studies, participate in stakeholder outreach, develop the County's Renewable Energy Element, and the associated CEQA Program EIR. Aspen will help the county identify Renewable Energy Development Areas (REDAs) suitable for siting of renewable energy (RE) in the County. San Bernardino County was one of five counties awarded a grant funded by the CEC Renewable Energy Planning Grant Program.
- **Desert Renewable Energy Conservation Plan and EIS/EIR, southern CA desert.** Senior Technical Specialist for BLM Lands/Realty, Environmental Justice, and Socioeconomics for Desert Renewable

Energy Conservation Plan (DRECP) and its Environmental Impact Report/Environmental Impact Statement (EIR/EIS). She's also serving as: the land use technical specialist for the land valuation team of the DRECP: the task Leader for the EIS/EIR analysis of transmission corridor route alternatives; and serves on the BLM "Red Team" for EIR/EIS technical review.

POWER GENERATION PROJECTS

California Energy Commission (CEC)

In response to California's power shortage, Aspen has assisted the CEC in evaluating the environmental and engineering aspects of new power plant applications throughout the State under five separate contracts. Ms. Vahidi has served as expert witness and Technical Senior for land use (since 2001), and a specialist for socioeconomics and environmental justice, and alternatives analyses and special studies. Her specific projects are listed below.

- Technical Assistance in Application for Certification Review (Contract # 700-99-014; 3/6/2000 through 12/31/2003)
  - **Woodland Generation Station No. 2, Modesto, CA.** As the land use Technical Specialist, prepared the Land Use and Recreation, and Agricultural Resources Staff Assessments of this 80-MW nominal, natural gas-fired power generating facility and associated linear facilities (i.e., gas and water pipeline and transmission line. The Staff Assessment evaluated potential impacts on nearby residential, recreational, and agricultural land uses, including important farmlands being traversed by linear faculties.
  - **Valero Cogeneration Project, Benicia, CA.** Prepared the Socioeconomics Staff Assessment for a proposed cogeneration facility at the Valero Refinery in Benicia. Issues addressed included impacts on public services and other project-related population impacts such as school impact fees.
  - **Rio Linda/Elverta Power Project, Sacramento, CA.** Prepared the Socioeconomics Staff Assessment for a 560-MW natural gas power plant in the northern Sacramento County. Issues of importance included environmental justice and impacts on property values.
  - **Magnolia Power Project, Burbank, CA.** As the Socioeconomics technical specialist, prepared the Staff Assessment for this nominal 250-MW natural gas combined-cycle fired electrical generating facility to be located at the site of the existing City of Burbank power plant. Environmental justice issues and potential impacts on local economy and employment were evaluated
  - **Potrero Power Plant Project, San Francisco, CA.** Prepared the land use portion of the Alternatives Staff Assessment for this proposed nominal 540-MW natural gas–fired, combined-cycle power generating facility. Analysis included review of several alternative sites for development of the power plant and the comparative merits of those alternatives with the proposed site located on the San Francisco Bay.
  - **Los Esteros Critical Energy Facility, San Jose, CA.** Senior Technical Specialist and expert witness for the Land Use Staff Assessment of this 180-MW natural gas-fired simple cycle peaking facility. Issues included potential impacts resulting from loss of agricultural land, and impacts associated with the project's non-compliance with local General Plan land use and zoning designations.
  - **East Altamont Energy Center, Alameda County, CA.** Senior Technical Specialist for the Land Use Assessment for a 1,100-MW nominal, natural gas-fired power plant and associated linear facilities. Provided expert witness testimony on Land Use Staff Assessment. Major issues addressed in

the Staff Assessment included loss of Prime Farmlands, recommendation of land preservation mitigation, and the project's non-compliance with local General Plan land use and zoning designations.

- **Tracy Peaker Project, Tracy, CA.** Senior Technical Specialist for the Land Use Staff Assessment of this 169-MW simple-cycle peaking facility in an unincorporated area of San Joaquin County. Provided expert witness testimony on Land Use Staff Assessment. Issues included potential impacts resulting from loss of agricultural land under Williamson Act Contract, and evaluation of cumulative development in the fast-growing surrounding area. The agriculture Condition of Certification from the Land Use Staff Assessment resulted in an Agricultural Mitigation Plan currently being implemented, and amended for continued implementation for the Tracy Combined-cycle Power Plant (see below).
- **Avenal Energy Project, Kings County, CA.** Socioeconomics Technical Specialist for this 600 MW combined-cycle electrical generating facility, and associated linear facilities.
- **Tesla Power Project, Alameda County, CA.** Land Use Technical Senior and Alternatives Technical Specialist in charge of preparation of two Staff Assessments for this nominal 1,120-MW electrical generating power plant with commercial operation planned for third quarter of 2004. The Tesla Power Project would consist of a natural gas-fired combined-cycle power generator, with 0.8 miles of double-circuit 230-kV transmission line connected to the Tesla PG&E substation, 24-inch 2.8-mile natural gas pipeline, and 1.7-mile water line constructed along Midway Road.
- **Sacramento Municipal Utility District Consumes Power Plant Project, Sacramento, CA.** Socioeconomics and Alternatives Technical Specialist in charge of preparation of two Staff Assessments for this nominal 1,000-MW combined-cycle natural gas facility. Provided expert witness testimony on Socioeconomics Staff Assessment. The project would include the construction and operation of a natural gas power plant at the Rancho Seco Nuclear Plant, 25 miles southeast of the City of Sacramento, in Sacramento County. The project would be located on a 30-acre portion of an overall 2,480-acre site owned by SMUD.
- **Inland Empire Energy Center, Riverside County, CA.** Senior Technical Specialist for the Land Use Assessment for a 670-MW natural gas-fired, combined-cycle electric generating facility and associated linear facilities including, a new 18-inch, 4.7-mile pipeline for the disposal of non-reclaimable wastewater, and a new 20-inch natural gas pipeline. Provided expert witness testimony on Land Use Staff Assessment. The project would be located on approximately 46 acres near Romoland, in Riverside County. Major issues addressed in the Staff Assessment included potential loss of agricultural lands, impacts to planned school uses, and the project's potential non-compliance with local General Plan land use and zoning designations.
- **Senior Technical Lead, Land Use Resources.** The CEC requested that the Aspen Team provide Technical Seniors for the Land Use Resources area in order to help coordinate and review Land Use Resource Assessments. As a Technical Senior, Negar Vahidi was responsible for the technical review of Land Use sections of Staff Assessments for various power plants.
- **Legislative Bill Review.** As a Land Use Technical Senior for the CEC, Ms. Vahidi conducted legislative bill review related to energy facilities siting. She conducted portions of the CEC Systems Assessment & Facilities Siting Division analysis of Senate Bill 1550 which was intended to give the Superintendent of Public Instruction/CDE approval authority over siting of power plants within one mile of existing or proposed K-12 school sites by requiring the CDE (in coordination with the State Architect, and the commission) to develop appropriate siting guidelines.

- Engineering & Environmental Technical Assistance to Support the Energy Facility Planning and Licensing Program Contract (Contract # 700-02-004; 6/30/03 through 3/30/06)

- **Environmental Performance Report (EPR).** Ms. Vahidi managed the preparation of the Socioeconomics chapter of the EPR for the California Energy Commission, which eventually became part of the State of California's Integrated Energy Policy Report (IEPR). The Socioeconomics chapter addressed: the importance of reliable and affordable electricity supply power plant construction and operation impacts, including labor force, taxation, etc.; and trends in the energy section, including renewable power sources such as wind and solar. She also conducted the analysis of a new portion of the Land Resources Chapter, which addressed the siting and land use issues associated with renewable power. This new portion of the land use analysis compared the land use and siting constraints associated with renewable power infrastructure such as wind and solar versus other forms of power infrastructure, such as gas pipelines, transmission lines, LNG facilities, and power plants.
- **Coastal Plant Study.** Ms. Vahidi served as the Social Sciences Task Manager for this special study being conducted as part of Aspen's contract with the California Energy Commission. The study included identification and evaluation of potential issues associated with the possible modernization, re-tooling, or expansion of California's 25 coastal power plants including: northern California power plants such as Humboldt, Potrero, Hunter's Point, Pittsburg, and Oakland; central coast power plants such as Contra Costa, Diablo Canyon Nuclear, Morro Bay, Moss Landing, Elwood, Mandalay, and Ormond Power Plants; and southern California power plants such as the Alamitos, Long Beach, Los Angeles Harbor, Haynes, Redondo Beach, Scattergood, El Segundo, Huntington Beach, Encina, Silver Gate, South Bay, and San Onofre Nuclear. As Task Manager her responsibilities included, identification of potential political, social, community, and physical land use impacts that may arise from the potential increased output of energy from plants in highly sensitive coastal communities. The intent of the study is to identify red flag items for the Energy Commission in order to streamline future licensing processes. Her task as the Social Science Task Manager also included a thorough review of applicable Local Coastal Plans, and Coastal Commission regulations associated with Coastal Development Permits and Consistency Determinations.
- **Natural Gas Market Outlook Report (NGMOR**). Ms. Vahidi assisted the CEC's Natural Gas Unit as a technical editor in their preparation and publication of the NGMOR. She managed Aspen's efforts, including format and graphics, to edit technical sections prepared by Natural Gas Unit Staff under a condensed time frame. The Preliminary NGMOR was released for public review in June 2003.

- Peak Workload Support for the Energy Facility Siting Program and the Energy Planning Program (Contract #700-05-002; and 4/11/06 through present); and Siting, Transmission, and Environmental Protection Peak Workload (STEP) (Contract #700-08-001; 6/30/09 through 5/31/10)
  - **Chula Vista Energy Upgrade Project, Chula Vista, CA.** Senior Technical Specialist for the Land Use Staff Assessment for MMC Energy, Inc.'s Application for Certification (AFC) to construct and operate replacements and upgrades of equipment at the Chula Vista Power Plant, located on a 3.8-acre parcel in the City of Chula Vista's Main Street Industrial Corridor and within the City's Light Industrial zoning district. Issues of concern include the impacts of the power plant on adjacent residential and open space land uses, and compliance with applicable local LORS, including recently adopted city environmental justice policies. Provided expert witness testimony on Land Use Staff Assessment.
  - **Ivanpah Solar Electric Generating System Project, San Bernardino County, CA.** Senior Technical Specialist for the Socioeconomics Staff Assessment/BLM EIS for a 400-MW solar thermal electric power generating system. The project's technology would include heliostat mirror fields focus-

ing solar energy on power tower receivers producing steam for running turbine generators. Related facilities would include administrative buildings, transmission lines, a substation, gas lines, water lines, steam lines, and well water pumps. The proposed project would be developed entirely in the Mojave Desert region of San Bernardino County. The document was prepared in compliance with both NEPA and CEQA requirements. Issues of concern included taxation, property values, environmental justice, local labor force concerns, project-related worker housing.

- **Sentinel Energy Project, Riverside County, CA.** Senior Technical Specialist for the Land Use Staff Assessment for CPV Sentinel's Application for Certification (AFC) to construct and operate an 850-MW peaking electrical generating facility near SCE's Devers Substation. The proposed project site consisted of 37 acres of land situated approximately eight miles northwest of the center of the City of Palm Springs with portions of the construction laydown area and natural gas pipeline within the Palm Springs city limits. Land use issues of concern included the project's compliance with local LORS, and parcel legality to comply with the Subdivision Map Act.
- **Carrizo Energy Solar Farm, San Luis Obispo County, CA.** Senior Technical Specialist for the Land Use Staff Assessment for Carrizo Energy, LLC's Application for Certification (AFC) to build the Carrizo Energy Solar Farm (CESF), which would consist of approximately 195 Compact Linear Fresnel Reflector (CLFR) solar concentrating lines, and associated steam drums, steam turbine generators (STGs), air-cooled condensers (ACCs), and infrastructure, producing up to a nominal 177 MW net. The CESF site was proposed to be located in an unincorporated area of eastern San Luis Obispo County, west of Simmler and northwest of California Valley. The CESF included the solar farm site, a minimal offsite transmission system connection, and construction laydown area. The CESF site encompassed approximately 640 acres of fenced area in an area zoned for agricultural uses as specified in the San Luis Obispo County General Land Use Plan. Issues of concern included the impacts of the power plant on agricultural land conversion, compatibility with adjacent land uses, and compliance with applicable local LORS. The development of the agriculture mitigation to reduce impacts resulting from the loss of 645 acres of Important Farmlands required extensive coordination with the California Department of Conservation, San Luis Obispo County Agriculture Department, and the San Luis Obispo County Land Conservancy.
- **Carlsbad Energy Center Project, Carlsbad, CA.** Senior Technical Specialist and expert witness for the Land Use and Alternatives Staff Assessments for Carlsbad Energy Center, LLC's Application for Certification (AFC) to build the Carlsbad Energy Center Project (CECP), which will consist of a 558-MW gross combined-cycle generating facility configured using two units with one natural gas-fired combustion turbine and one steam turbine per or unit. Issues of concern include major incompatibilities with local LORS, and cumulative impacts from widening of I-5. Ms. Vahidi conducted the California Coast Act Consistency Determination in lieu of the California Coastal Commission (CCC), because the CCC opted to have the CEC conduct the consistency analysis with the Coastal Act.
- **Marsh Landing Generating Station, Contra Costa County, CA.** Senior Technical Specialist for the Land Use Staff Assessment for the Mirant Marsh Landing, LLC AFC for a 930-MW natural gas-fired power plant, which would be would be sited adjacent to the existing Contra Costa Power Plant in unincorporated Contra Costa County, near the City of Antioch. Issues of concern included impacts to nearby agricultural resources, compatibility with adjacent land uses, compliance with local LORS, and parcel legality to comply with the Subdivision Map Act.
- **Canyon Power Plant, Anaheim, CA.** Senior Technical Specialist for the Socioeconomics Staff Assessments for a nominal 200-MW simple-cycle plant, using four natural gas-fired combustion turbines and associated infrastructure proposed by Southern California Public Power Authority

(SCPPA). This project is a peaking power plant project located within the City of Anaheim. Issues of concern included impacts to local employment and housing.

- **Willow Pass Generating Station, Pittsburg, CA.** Senior Technical Specialist for the Land Use Staff Assessment for a new, approximately 550-MW dry-cooled, natural gas-fired electric power facility proposed by Mirant. Development of Willow Pass would entail the construction of two generating units and ancillary systems including, adjacent electric and gas transmission lines, and water and wastewater pipelines. Issues of concern include impacts to nearby agricultural resources, compatibility with adjacent land uses, compliance with local LORS, and parcel legality to comply with the Subdivision Map Act. This project is currently on hold.
- **Calico Solar One Project (a.k.a. Stirling Energy Systems Solar One), San Bernardino County, CA.** Senior Technical Specialist and expert witness for the Land Use Staff Assessment/BLM EIS for a nominal 850 MW Stirling engine project. The primary equipment for the generating facility would include the 34,000 25-kilowatt solar dish Stirling systems (referred to as SunCatchers), their associated equipment and systems, and their support infrastructure. Major issues of concern include the conversion of approximately 8,230 acres of open space to industrial uses, compliance with BLM's CDCA Plan, access to landlocked private parcels, compatibility with the on-site BNSF railroad right-of-way, and significant cumulative land use impacts resulting from the conversion of 1,000,000 acres of southern California desert lands. Currently, staff is working on analyzing two new reduced project alternatives, because of the significant impacts of the project as proposed.
- **Imperial Valley Solar Project (a.k.a. Stirling Energy Systems Solar Two), Imperial County, CA.** Senior Technical Specialist and expert witness for the Land Use Staff Assessment/BLM EIS for a nominal 750-MW Stirling engine project. The primary equipment for the generating facility would include the approximately 30,000 25-kilowatt solar dish Stirling systems (referred to as SunCatchers), their associated equipment and systems, and their support infrastructure. Major issues of concern include conversion of 6,500 acres of public recreation land used for OHV use and camping, compliance with the BLM's CDCA plan and local LORS, parcel legality issues in compliance with the Subdivision Map Act, and significant cumulative land use impacts resulting from the conversion of 1,000,000 acres of southern California desert lands. Ms. Vahidi coordinated extensively with Imperial County regarding the project's inconsistencies with local LORS.
- **GWF Tracy Combined-Cycle Power Plant, San Joaquin County, CA.** Senior Technical Specialist and expert witness for the Land Use Staff Assessment for GWF's proposal to modify the existing TPP (see description above), a nominal 169-MW simple-cycle power plant, by converting the facility into a combined-cycle power plant with a nominal 145 MW, net, of additional generating capacity. Major issues of concern included conversion of Important Farmlands, and the continued implementation of the Agricultural Mitigation Plan resulting from the agriculture Condition of Certification imposed on the Tracy Peaker Project.
- **City of Palmdale Hybrid Power Plant Project, Palmdale, CA.** Senior Technical Specialist for the Land Use Staff Assessment for the Palmdale Hybrid Power Project (PHPP) proposed by the City of Palmdale. Also, authored the comprehensive land use analysis of two transmission line alternatives included as an appendix to the Staff Assessment. The PHPP consists of a hybrid of natural gas–fired combined-cycle generating equipment integrated with solar thermal generating equipment to be developed on an approximately 377-acre site in the northern portions of the City of Palmdale (City). Major issues of concern include compatibility impacts of the proposed project's linear facilities on adjacent land uses, and the proposed Gen-Tie's LORS inconsistency impacts in both the City of Palmdale and Los Angeles County.

- **Lodi Energy Center, Lodi, CA.** Senior Technical Specialist for the Socioeconomics Staff Assessment for a combined-cycle nominal 225-MW power generating facility. Issues of concern included impacts to local workforce and employment, and taxation.
- **Abengoa Mojave Solar One Project, San Bernardino County, CA.** Senior Technical Specialist and expert witness for the Land Use Staff Assessment of a nominal 250-MW solar electric generating facility to be located near Harper Dry Lake in an unincorporated area of San Bernardino County. Issues of concern include the impacts associated with the conversion of 1,765 acres of Important Farmlands, and over 2,000 acres of open space lands. The analysis of agricultural land conversion impacts and associated mitigation required extensive coordination with the California Department of Conservation, San Bernardino County, and Transition Habitat Conservancy.
- **Genesis Solar Energy Project, Riverside County, CA.** Senior Technical Specialist for the Land Use Staff Assessment/BLM EIS for two independent solar electric generating facilities with a nominal net electrical output of 125 MW each, for a total net electrical output of 250 MW. Electrical power would be produced using steam turbine generators fed from solar steam generators. The project is located approximately 25 miles west of the city of Blythe. Major issues of concern include conversion of 4,460 acres of BLM lands to an industrial use, and significant cumulative land use impacts resulting from the conversion of 1,000,000 acres of southern California desert lands.
- **Oakley Generating Station, Contra Costa County, CA.** Senior Technical Specialist for the Land Use Staff Assessment for a natural gas-fired, combined-cycle electrical generating facility rated at a nominal generating capacity of 624 MW. The project would be located in the City of Oakley. Issues of concern include compatibility with adjacent land uses, and compliance with City of Oakley LORS.

- Siting, Transmission, and Environmental Protection Peak Workload (Contract # 700-11-027; 6/30/12 through 5/31/15)
  - **Hydrogen Energy California (HECA) Power Plant, Kern County, CA.** Senior Technical Specialist and expert witness in charge of preparation of the Alternatives Staff Assessment for this integrated gasification combined cycle (IGCC) power generating facility. The project includes an integrated fertilizer production plant, and a rail spur for use in coal and pet-coke deliveries and transporting the nitrogen-based fertilizer, degassed liquid sulphur, and gasification solids. This is a joint SA/EIS, with US DOE as the lead NEPA agency.
  - **Redondo Beach Energy Project (RBEP), Los Angeles, CA.** Senior Technical Specialist and expert witness in charge of preparation of the Alternatives Staff Assessment for this proposed natural-gas fired, combined-cycle, air-cooled electrical generating facility with a net generating capacity of 496 megawatt (MW), which will replace, and be constructed on the site of the AES Redondo Beach Generating Station.
  - **Huntington Beach Energy Project (HBEP), Huntington Beach, CA.** Senior Technical Specialist and expert witness in charge of preparation of the Alternatives Staff Assessment for this proposed natural-gas fired, combined-cycle, air-cooled, 939-megawatt (MW) electrical generating facility that will replace the AES Huntington Beach Generating Station.

Other Agencies

- **California Department of Boating and Waterways, Boating Facilities Division – Environmental Consulting Services, Southern California Projects.** Project Manager for completing the necessary environmental documentation to meet CEQA and NEPA requirements and provide the permit application materials to complete the permit process on behalf of the DBW for the following six southern California recreational facilities: Pyramid Lake Floating Campsites, Pyramid Lake Spanish Point Visitor Dock, Pyramid Lake Serrano Boat-In Site Improvements, Castaic Lake East Ramp Entrance Road Improvements, Castaic Lake Shade Ramada Replacement, and Silverwood Lake Boat-In Site Improvements. Due to State budgetary issues, work on these projects was halted and the contract was cancelled.

- **Environmental Review Policy Document/Fresno-to-Bakersfield High-Speed Rail Revised Draft EIR/EIS Review, Kern County, CA.** The Kern Council of Governments (COG) selected Aspen to prepare their policy guidance document for review of CEQA documents and to conduct Kern COG's review of the High-Speed Rail Revised Draft EIS/EIR. Ms. Vahidi served as Aspen's Project Manager. The project was canceled.
- **Alta East Wind Project EIR/EIS, Kern County, CA.** Ms. Vahidi served as Aspen's Project Manager for the proposed Alta East Wind Project EIR/EIS, which would generate up to 300 megawatts (MW) of electricity through wind power. The NEPA Lead Agency is BLM. The proposed project includes up to 120 wind turbine generators, a substation, transmission interconnection to the SCE Windhub Substation, access roads, and ancillary facilities. The proposed project area comprises 3,200 acres, 2,083 acres of which are on BLM land three miles northwest of the unincorporated town of Mojave in southeastern Kern County, California. The project was approved by the Kern County Board of Supervisors in January 2013. The Record of Decision was published in the Federal Register on May 24, 2013.
- **Tule Wind EIS, Third Party NEPA Review, San Diego County, CA.** Under contract to the Bureau of Land Management (BLM), Ms. Vahidi is serving as Aspen's Project Manager and assisting the BLM in reviewing the Draft and Final EIS/EIR for the proposed Tule Wind Project (EIS) to meet BLM and NEPA requirements. The EIS/EIR is being prepared by a consultant under contract to the CPUC, also directed by BLM, together with San Diego County, Bureau of Indian Affairs, and California State Lands Commission. The joint document evaluates the proposed Tule Wind Project and the proposed East County Substation Project (ECO), along with other related parts of both projects. The BLM is the lead agency for NEPA compliance and the CPUC is the lead agency for CEQA compliance.
- **Ocotillo Express Wind Energy Project EIS/EIR, Imperial County, CA.** Ms. Vahidi serves as senior technical reviewer for the EIR/EIS with expertise in CEQA, NEPA, Social Science issues, and BLM requirements. Aspen is prepared the EIS/EIR for the BLM and the County of Imperial for a 550-MW wind energy project near the town of Ocotillo. The proposed project is spread across a 14,980-acre site and consists of the installation of 193 wind turbine generators and construction of a substation.
- **Topaz Solar Project EIR, County of San Luis Obispo, CA** (Applicant: First Solar). Aspen is managing preparation of an EIR for this 500-MW solar photovoltaic project in the Carrizo Plain area. A major issue of concern is the conversion of approximately 6,000 acres of open space (60 percent of which are under land preservation contracts) to an industrial use. Ms. Vahidi is the senior in charge of developing the methodology, approach, and thresholds of significance for analysis of impacts related to agricultural land conversion using the California Department of Conservation LESA Model. One major issue of concern related to agricultural resources is impacts to lands under Williamson Act contracts. She will be guiding the analysis.
- **California Valley Solar Ranch EIR** (Applicant: SunPower), **County of San Luis Obispo, CA**. Aspen is managing preparation of an EIR for this 250 MW solar photovoltaic project in the Carrizo Plain area. A major issue of concern is the conversion of approximately 4,000 acres of open space to an industrial use. Ms. Vahidi is the senior in charge of developing the methodology, approach, and thresholds of significance for analysis of impacts related to agricultural land conversion using the California Department of Conservation LESA Model. She will be guiding the analysis.

- **San Onofre Nuclear Generating Station (SONGS) Steam Generator Replacement Project, San Clemente, CA.** Ms. Vahidi served as the Technical Senior in charge of developing the methodology and guiding the analysis for the Land Use and Recreation Section of this EIR for the California Public Utilities Commission (CPUC). This project EIR addressed the environmental effects of SCE's proposed replacement of Steam Generator Units 2 & 3 at the SONGS Nuclear Power Plant located entirely within the boundaries of the US Marine Corps Base at Camp Pendleton. Issues of concern included potential conflicts resulting from the transport of the large units through sensitive recreation areas such as beaches, and the San Onofre State Park.
- **Diablo Canyon Power Plant (DCPP) Steam Generator Replacement Project, San Luis Obispo County, CA.** Ms. Vahidi served as the Technical Senior in charge of developing the methodology and guiding the analysis for the Land Use and Recreation Section of this EIR prepared for the CPUC. The EIR addressed impacts associated with the replacement of the eight original steam generators (OSGs) at DCPP Units 1 and 2 due to degradation from stress and corrosion cracking, and other maintenance difficulties. The Proposed Project would be located at the DCPP facility, which occupies 760 acres within PG&E's 12,000-acre owner-controlled land on the California coast in central San Luis Obispo County. Land use issues of concern include impacts to agricultural lands, recreational resources, and potential Coastal Act inconsistencies.
- **EIR for South San Joaquin Irrigation District's (SSJID) Plan to Provide Retail Electric Service, Sphere Plan, MSR, and Annexation, San Joaquin County, CA.** This Subsequent EIR (SEIR) evaluates environmental impacts associated with the SSJID application to provide retail electric service, and evaluates changes in the project and changes with respect to the circumstances under which the project would be undertaken that have occurred since the original 2006 Final EIR was certified. LAFCo may then certify the Final SEIR and take action to adopt the Sphere Plan and MSR, adopt the proposed SOI, approve the annexation, and approve the application to provide retail electric service. Ms. Vahidi provided CEQA expertise to SSJID, and served as the Senior Technical lead for the social science sections of the SEIR, including agriculture, land use, policy analysis, and socioeconomics.
- **Valley Generating Station Site Survey & Documentation Report, Los Angeles, CA.** Under Aspen's on-going environmental services contract with the LADWP, Ms. Vahidi managed the preparation of a comprehensive report (over 150 pages) documenting all of the structures and facilities located at the Valley Generating Station (VGS). The report includes exhibits that illustrate locations of each structure at the VGS, a detailed appendix of color photos of each structure, and a written description of each structure. The report also provides a general discussion of the history and background of the VGS and its development to provide a context for the structures on site.
- **Pine Tree Wind Project, Kern County, CA.** Under Aspen's on-going environmental services contract with the LADWP, Ms. Vahidi managed the preparation of a detailed comparison matrix of the changes to the EIR/EA (LADWP/BLM) project description and environmental impacts of the originally proposed project and the revised proposed project for the 120 MW Pine Tree Wind Power Project, the largest municipally owned wind farm in the U.S. Additionally, the emissions presented in the original EIR/EA were provided for comparison. Upon completion of the proposed project's emission estimates using information from the second proposed design, the results of the analysis were incorporated into the Air Quality Technical Report.

Transmission Line and Substation Projects

- **Western Area Power Administration, Desert Southwest Region.** Under Aspen's master contract with U.S. DOE, Western Area Power Administration, Desert Southwest Region, Ms. Vahidi serves as a Task Order Manger for Western's operations and maintenance activities of its transmission line system, and associated access roads and rights-of-way (ROW). Task Orders typically include background research and surveys in support of NEPA Categorical Exclusions (CXs). The Task Orders she has managed include:

- **Electrical District #2-Saguaro #1 (ED2-SGR1) 115-kV Transmission Line Project CX, Pinal County, Arizona.** Pole replacement along two segments of the existing ED2-SGR1 115-kV transmission line ROW: 9.4 along ED2-ED4; and 17 miles along ED5-SGR1. Ms. Vahidi managed the biological resources surveys, the cultural resource surveys in support of NHPA Section 106 permitting and a CX determination for pole replacement. She also prepared the NEPA CX.
- **Parker-Blythe #1 Cross Arm Replacement Project, La Paz County, Arizona.** Western proposes to repair or replace cross arms on eleven existing structures of the Parker-Blythe #1 Transmission Line located just east of the Colorado River. Portions of the ROW are on tribal lands managed by the Bureau of Indian Affairs and lands managed by the Arizona State Land Trust. The Project includes four helicopter staging, including three one that is located on private land across the river in San Bernardino County, California. Ms. Vahidi is managing the biological resources surveys, the cultural resource surveys in support of NHPA Section 106 permitting and a CX determination.
- **Mead-Liberty Transmission Line Access Road Project, Maricopa County, Arizona.** Western proposes to conduct access road maintenance and remove vegetation along the existing Mead-Liberty 345-kV transmission line. This work is necessary to maintain the safety and reliability of the bulk electrical system. Ms. Vahidi is managing the biological resources surveys, the cultural resource surveys in support of NHPA Section 106 permitting and a CX determination, and review of the visual effects on BLM Lands through coordination with the BLM Hassayampa Field Office to determine the BLM VRM classifications.
- **Prescott-Pinnacle Peak Access Road Maintenance Project, southern Yavapai and northern Maricopa Counties, Arizona.** Western proposes to conduct access road maintenance and vegetation management along three segments of the Prescott-Pinnacle Peak 230 kV Transmission Line right-of-way (ROW). Access road maintenance, including brush clearance, would occur along 5.8 miles of existing 50-foot wide access roads. Ms. Vahidi is managing the biological resources surveys, the cultural resource surveys in support of NHPA Section 106 permitting, the Clean Water Act compliance, and review of the visual effects on BLM Lands through coordination with the BLM Hassayampa Field Office to determine the BLM VRM classifications.
- **Henderson-Mead Access Road Maintenance Project, Clark County, Nevada.** Western proposes to conduct Road improvement work along approximately 4.1 miles of the Henderson-Mead #1 230-kV Transmission Line, with a total of approximately 1.8 miles of existing roads that will require maintenance. Aspen has prepared the Biological Resources Survey Report and Draft Preliminary Jurisdictional Waters/Wetlands Delineation Report. Based on recommendations from these reports, Aspen is in the process of preparing the Pre-construction Notification and Permit Application Report to support a Clean Water Act Section 404 Nationwide permit for impacts to waters of the U.S., including wetlands, from the U.S. Army Corps of Engineers; and a Clean Water Act Section 401 water quality certification from the Arizona Department of Environmental Quality. Ms. Vahidi is managing the preparation of these items.
- **Blythe-Knob Transmission Line Maintenance Project, eastern Riverside and Imperial Counties, California**. Western proposes to conduct maintenance activities along the Blythe-Knob (BLY-KNB) 161-kV Transmission Line, which is 64.4 miles in length, between the Blythe Substation near Highway 10 in Riverside County, and the Knob Substation near Highway 8 in Imperial County. The Gold Tap Substation is located along the Blythe-Knob Transmission Line, about 43

miles north of the Knob Substation, also in Imperial County. Maintenance activities are proposed at 116 of 484 towers along this line and include the following repairs: 24 pole replacements; 73 cross arm replacements; 21 cross arm brace replacements; 2 insulator replacements; 4 loose pole ground replacements; and 1 replacement of twisted armor rod. Ms. Vahidi is managing the preparation of the Biological Resources Surveys.

- **Rattlesnake-Del Bac Access road and Vegetation Management Project, Pima County, Arizona.** Western proposes to conduct access road maintenance and vegetation management activities along its Rattlesnake to Del Bac 115-kV transmission line. The project segment is the access road between Twin Peaks Pump and Sandario Pump. Ms. Vahidi is currently managing the biological resources surveys for the Project.

- **TANC Transmission Project (TTP), several Northern California Counties.** Ms. Vahidi served as the Deputy Project Manager in charge of preparation of the EIR/EIS and guiding the CEQA/NEPA analysis. The Transmission Agency of Northern California (TANC) and Western Area Power Administration (Western), an agency of the US Department of Energy (DOE), are the CEQA lead agency and NEPA lead agency, respectively. The TTP generally would consist of approximately 600 miles of new and upgraded 500-kilovolt (kV) and 230-kV transmission lines, substations, and related facilities generally extending from northeastern California near Ravendale in Lassen County to the California Central Valley through Sacramento and Contra Costa Counties and westward into the San Francisco Bay Area. Ms. Vahidi worked with TANC and Western to initiate the scoping process, including preparation of the NOP, preparing for scoping meetings, frameworking the EIR/EIS document, etc. She also led the preparation of the project scoping report. The project was cancelled in July 2009.

- **El Casco System Project, Riverside, CA.** Ms. Vahidi served as the Project Manager for this EIR prepared for the CPUC to evaluate SCE's application for a Permit to Construct (PTC) the El Casco System Project. The Proposed Project would be located in a rapidly growing area of northern Riverside County, which includes the Cities of Beaumont, Banning, and Calimesa. A 115-kV subtransmission line begins at Banning Substation and extends westward toward the proposed El Casco Substation site within the existing Banning to Maraschino 115-kV subtransmission line and Maraschino–El Casco 115-kV subtransmission line ROWs. Major issues of concern include impacts to existing and residential land uses, which have led to the development of a partial underground alternative and a route alternative different than the project route proposed by SCE (the Applicant). The 1,200-page Draft EIR was released for a 45-day public review and comment on December 12, 2007, and evaluates project alternatives at the same level of detail as the Proposed Project analysis. The project is currently under construction.

- **Sacramento Area Voltage Support Supplemental Environmental Impact Statement (SEIS), Western Area Power Administration.** Ms. Vahidi served as the task leader for several social science sections for the SEIS for a double-circuit 230-kV circuit between Western's O'Banion/Sutter Power Plant and Elverta Substation/Natomas Substation. New transmission lines and transmission upgrades are needed to mitigate transmission line overload, reduce the frequency of automatic generation and load curtailment during the summer peak load periods, and help maintain reliability of the interconnected system operation. Ms. Vahidi directed the preparation of the land use, aesthetics, socioeconomics, and environmental justice sections of the SEIS.

- **Sunset Substation and Transmission and Distribution Project CEQA Documentation, Banning, CA.** The City of Banning proposes to construct the Sunset Substation and supporting 33-kilovolt (kV) transmission line that would interconnect with the City's existing distribution system. The purpose of this new substation and transmission is to relieve the existing overloads that are occurring within the City's electric system and to accommodate projected growth in the City. Ms. Vahidi served as the Environmental Project Manager for the initial stages of CEQA documentation prepared for the City's Utility Department.

- **Devers–Palo Verde 500-kV Transmission Line Project EIS/EIR, southern California/western Arizona.** For this EIR/EIS prepared by US Bureau of Land Management and CPUC, Ms. Vahidi served as the Deputy Project Manager and Social Sciences Issue Area Coordinator for SCE's proposed 250-mile transmission line project from the Palo Verde Nuclear power plant in Arizona to the northern Palm Springs area in California. Major issues of concern include EMF and visual impacts on property values, impacts on the area's vast recreational resources and tribal lands, and the development and evaluation of several route alternatives, including the Devers-Valley No. 2 Route Alternative, which eventually was approved by the CPUC.
- **Devers–Palo Verde 500-kV Transmission Line Project MMCRP, southern California.** For the Mitigation Monitoring, Reporting, and Compliance Program (MMCRP), Ms. Vahidi is serving as Senior Land Use specialist reviewing pre-construction mitigation implementation plans. Currently, she is reviewing the Construction Notification Plan prepared by SCE.
- **Antelope-Pardee 500-kV Transmission Line Project (a.k.a. TRTP Segment 1) EIR/EIS, Los Angeles County.** For this EIR/EIS prepared by USFS, Angeles National Forest and CPUC, Ms. Vahidi served as the Deputy Project Manager and Social Sciences Issue Area Coordinator for SCE's proposed 26-mile transmission line project from the Antelope Substation in the City of Lancaster, through the ANF, and terminating at SCE's Pardee Substation in Santa Clarita. Major issues of concern included impacts to biological, recreational, and cultural resources within Forest lands, EMF and visual impacts on property values, impacts on residences in the urbanized southern regions of the route, and the development and evaluation of several route alternatives.
- **Antelope Transmission Project (a.k.a. TRTP), Segments 2 & 3 EIR, Los Angeles and Kern Counties.** For this EIR being prepared by the CPUC, Ms. Vahidi served as the Deputy Project Manager and Social Sciences Issue Area Coordinator. The proposed Project includes both Segment 2 and Segment 3 of the Antelope Transmission Project, and involves construction of new transmission line infrastructure from the Tehachapi Wind Resource Area in southern Kern County, to SCE's existing Vincent Substation in Los Angeles County. The Tehachapi Wind Resource Area is one of the State's greatest potential sources for the generation of wind energy. A variety of wind energy projects are currently in development for this region. Major issues of concern include EMF and visual impacts on property values, impacts on residences and agricultural resources, and the development and evaluation of several substation and route alternatives.
- **Tehachapi Renewable Transmission Project (TRTP, Segments 4 through 11) EIR/EIS, Kern, Los Angeles, and San Bernardino Counties.** For this EIR/EIS prepared by USFS, Angeles National Forest and CPUC, Ms. Vahidi is served as the Deputy Project Manager in the early stages (i.e., during Scoping) of the project for SCE's proposal to construct, use, and maintain a series of new and upgraded high-voltage electric transmission lines and substations to deliver electricity generated from new wind energy projects in eastern Kern County. Approximately 46 miles of the project would be located in a 200- to 400-foot right-of-way on National Forest System land (managed by the Angeles National Forest) and approximately three miles would require expanded right-of-way within the Angeles National Forest. The proposed transmission system upgrades of TRTP are separated into eight distinct segments: Segments 4 through 11. Segments 1 (Antelope-Pardee) and Segments 2 and 3 (Antelope Transmission Project) were evaluated in separate CEQA and NEPA documents as described above.
- **Jefferson-Martin 230 kV Transmission Line Project EIR, San Francisco Bay Area, CA.** Ms. Vahidi served as the Issue Area Coordinator for the Social Science issues of the EIR, and was responsible for preparation of the socioeconomics, recreation, and public utilities sections of the EIR prepared on

behalf of the California Public Utilities Commission (CPUC) to evaluate a proposed 27-mile transmission line in San Mateo County. Major issues of concern included EMF and visual impacts on property values, impacts on the area's vas recreational resources, and evaluation of several route alternatives.

- **Miguel-Mission 230 kV #2 Project EIR, San Diego County, CA.** Ms. Vahidi conducted the land use, recreation, socioeconomics, and environmental justice analyses for this EIR for a proposed 230-kV circuit within an existing transmission line ROW between Miguel and Mission substations in San Diego County. The proposed project included installing a new 230-kV circuit on existing towers along the 35-mile ROW, as well as relocate 69-kV and 138-kV circuits on approximately 80 steel pole structures. In addition, the Miguel Substation and Mission Substation would be modified to accommodate the new 230-kV transmission circuit.
- **Viejo System Project, Orange County, CA.** Ms. Vahidi served as the Deputy Project Manager for the project's CEQA documentation, including and Initial Study, prepared on behalf of the CPUC to evaluate Southern California Edison's (SCE) Application for a Permit to Construct the Viejo System Project, which was in SCE's forecasted demand of electricity and goal of providing reliable electric service in southern Orange County. The Viejo System Project would serve Lake Forest, Mission Viejo, and the surrounding areas. Components of the project included, construction of the new 220/66/12-kilovolt (kV) Viejo Substation, installation of a new 66 kV subtransmission line within an existing SCE right-of-way, replacement of 19 double-circuit tubular steel poles with 13 H-frames structures, and minor modification to other transmission lines. Major issues of concern include visual impacts of transmission towers, EMF effects, and project impacts on property values.
- **SCE Calnev Power Line and Substation Project IS/MND, Colton, CA.** Aspen was contracted to thoroughly review and analyze Southern California Edison Company's Application for a Permit to Construct and Proponent's Environmental Assessment (PEA) for the Calnev Power Line and Substation Project in the City of Colton. Ms. Vahidi served as the Deputy Project Manager for preparation of the IS/MND. Tasks include: a site visit, and evaluation of the project's compliance with the Commission's General Order 131D, Rule 17.1, and associated information submittal requirements; and preparation of a letter report identifying data deficiencies of the Application and PEA. Upon formal CPUC acceptance of the Application and PEA, Aspen prepared a CEQA Initial Study Checklist by identifying baseline data, project characteristics, and determining impact significance for each issue area. Each issue area's impact determination was supported by a paragraph or more of analysis describing the rationale for the impact identified, or for the lack of a significant impact. Upon completion of the Initial Study, the Mandatory Findings of Significance were prepared and Aspen determine that a Mitigated Negative Declaration should be prepared per CEQA Guidelines.
- **SCE Six Flags Substation and Power Line Project IS/MND, Valencia, CA.** Ms. Vahidi served as Deputy Project Manager for preparation of the IS/MND. Reviewed and provided comments on the permit application by SCE to construct a substation and power line to provide electrical service to Six Flags Amusement Park in Valencia. Subsequent to the application completeness review, she prepared the project's Initial Study Checklist and Mitigated Negative Declaration for the California Public Utilities Commission (CPUC). Identified possible deficiencies and provided recommendations.
- **Alturas Transmission Line Project EIR/EIS, several Northeastern California counties.** Ms. Vahidi conducted the analysis of potential impacts on minority populations and low-income populations in compliance with Presidential Executive Order 12898 on Environmental Justice using Census data to determine population density, minority population percentages and unemployment rates, and the potential impacts of the transmission line on affected communities. She also prepared the cumulative projects list and map used for analyses of cumulative impacts. She managed development of

meeting handouts; scheduling and logistics for four scoping meetings; developed and maintained project mailing list; reviewed public scoping comments and prepared the Scoping Report; coordinated four sets of informational workshops and public hearings for the Draft EIR/EIS; supervised the distribution of comments on the Draft EIR/EIS to the project team; and coordinated the distribution of the Draft and Final EIR/EIS to affected public agencies, organizations, and citizens.

WATER INFRASTRUCTURE AND SUPPLY PROJECTS

- **Littlerock Reservoir Sediment Removal Project EIS/EIR, Palmdale, CA.** Ms. Vahidi is the Project Manager for this joint EIS/EIR evaluating the impacts of sediment removal alternatives for the Littlerock Reservoir and Dam on USFS Angeles National Forest (NEPA Lead Agency) lands in Los Angeles County. The Palmdale Water District (District) [CEQA Lead Agency] proposes to remove approximately 1,000,000 cubic yards of sediment from the reservoir (behind the dam) and haul it to off-site commercial gravel pits located 6 miles north of the dam site in the community of Littlerock. The project involves impacts to the arroyo toad, extensive coordination with USFWS for a Section 7 consultation, incorporation of new Forest Service Plan updates and requirements into the analysis, preparation of the Forest Service required BE/BA, and analysis of compliance with federal air quality conformity requirements. Under Ms. Vahidi's direction, Aspen developed several different project alternatives for sediment removal and deposition, involving detailed hydraulics analysis and preparation of a hydraulics technical report, and coordinaton with off-site uses that can accept sediment. The most feasible of these alternatives (grade control structure) was chosen by the PWD as their proposed project to be evaluated in the EIS/EIR. In addition, the PWD is currently considering an additional alternative (use of a slurry line for sediment removal) presented by Aspen. Aspen is currently developing the project design and working on the Administrative Draft EIR/EIS and.
- **Santa Ana Valley Pipeline Repairs Project, San Bernardino and Riverside Counties, CA.** Under Aspen's on-going environmental services contract with the DWR, Ms. Vahidi served as the project manager for CEQA documentation and permitting efforts related to the repair of 12 sites along the pipeline portion of the East Branch of the California Aqueduct. The repair of the 12 sites was crucial because, eight of the Priority 1 sites included areas of the pipeline that were under high stress and subject to rupture. Issues of concern included, potential impacts to special status species, sensitive receptors, and traffic. As the DWR's CEQA consultant, Ms. Vahidi determined that the proposed SAPL Repairs Project would qualify for a CEQA Categorical Exemption, and recommended the preparation of a Technical Memorandum to justify this exemption. The Technical Memorandum and supporting documentation, including a Biological Constraints Report, and analyses of proposed project potential construction-related air quality, noise, and traffic impacts, were prepared and presented to DWR as one packet to support both a Class 1 and Class 2 CEQA Exemption. Subsequent to preparation of this packet, DWR filed a Notice of Exemption on June 13, 2003 for their repair activities.
- **Piru Creek Erosion Repairs and Bridge Seismic Retrofit Project, northern Los Angeles County, CA.** Under Aspen's on-going environmental services contract with the DWR, Ms. Vahidi served as the project manager for CEQA documentation for this project. An IS/MND was prepared to evaluate the impacts of the project, which proposed to maintain four access routes to DWR's facilities along the West Branch of the California Aqueduct downstream of the Pyramid Dam. Repair and improvement activities would occur on Osito Canyon (an intermittent tributary to Piru Creek) at Osito Adit, adjacent to Old Highway 99 at North Adit (or access tunnel), alongside an eroded section of Old Highway 99 along Piru Creek, and at Pyramid Dam Bridge. Repair activities would serve to improve conditions of access routes, as well as strengthening and reinforcing them against seismic or flood events. Project-related construction could result in potentially significant impacts to biological

resources, cultural resources, geology and soils, hazards and hazardous materials, hydrology and water quality, noise, and transportation and traffic.

- **Pyramid Lake Repairs and Improvements Project, northern Los Angeles County, CA.** Under Aspen's on-going environmental services contract with the DWR, Ms. Vahidi served as the project manager for CEQA documentation, ADA (Americans with Disabilities Act) compliance, and permitting efforts for this project. DWR and the Department of Boating and Waterways (DBW) are planning repairs and improvements at various recreational sites at Pyramid Lake, which is located on the border between Los Padres National Forest and Angeles National Forest; recreation is managed by Angeles National Forest. The lake is also part of Federal Energy Regulatory Commission Project 2426. Aspen worked with DWR and DBW to determine ADA compliance components at each site. CEQA documentation in support of a Class 1 and 2 Categorical Exemption was prepared to evaluate the potential impacts of the repairs and improvements, and provide CEQA clearance for filing of required permit applications, including but not necessarily limited to 404, 401, and 1602 permits. In addition to the CEQA documentation and preparation of permit applications, Aspen coordinated DWR and DBW's efforts with the USFS, and the permitting agencies (i.e., CDFG, RWQCB, and USACE). Through coordination with the USAC, Aspen prepared the NEPA EA for Corps 404 permit process, and reviewed and coordinated revisions to the 1602 with CDFG.
- **Mulholland Pumping Station and Lower Hollywood Reservoir Outlet Chlorination Station Project, Los Angeles, CA.** Under Aspen's on-going environmental services contract with the City of Los Angeles Department of Water and Power (LADWP), Ms. Vahidi served as the Project Manager for preparation of CEQA documentation for this project. LADWP proposed to replace the existing historic pumping/chlorination station building as well as the existing lavatory and unoccupied Water Quality Laboratory buildings with a new single structure pumping/chlorination station within the LADWP's Hollywood Reservoir Complex located in the Hollywood Hills section of the City Los Angeles. These improvements were required due to the age and deterioration of the facility and the potential risk of seismic damage to existing structures. An Initial Study was prepared in support of a City of Los Angeles General Exemption.
- **River Supply Conduit (RSC) Upper Reach Project EIR, Los Angeles and Burbank, CA.** Under Aspen's on-going environmental services contract with the City of Los Angeles Department of Water and Power (LADWP), Ms. Vahidi served as the Task Leader for land use issues and is in charge of development and analysis of project alternatives for the CEQA document for this project. The RSC is a major transmission pipeline in the LADWP water distribution system. The existing RSC pipeline's purpose is to transport large amounts of water from the Los Angeles Reservoir Complex and local ground water wells to reservoirs and distribution facilities located in the central areas within of the City of Los Angeles. The LADWP proposed a new larger RSC pipeline to replace and realign the Upper and Lower Reaches of the existing RSC pipeline, which would involve the construction of approximately 69,600 linear feet (about 13.2 miles) of 42-, 48-, 60-, 66-, 72-, 84-, and 96-inch diameter welded steel underground pipeline.
- **Taylor Yard Water Recycling Project (TYWRP), Los Angeles and Glendale, CA.** Under Aspen's on-going environmental services contract with the City of Los Angeles Department of Water and Power (LADWP), Ms. Vahidi served as the Project Manager for preparation of CEQA documentation for this project. LADWP proposed to construct the TYWRP in order to provide recycled water produced by the Los Angeles–Glendale Water Reclamation Plant (LAGWRP) to the Taylor Yard. An important part of the City of Los Angeles' expanding emphasis on water conservation is the concept that water is a resource that can be used more than once. Because all uses of water do not require the same quality of supply, the City has been developing programs to use recycled water for suitable land-

scaping and industrial uses. The project is located in the southernmost part of the City of Glendale and northeastern part of the City of Los Angeles. The IS/MND was adopted in the summer of 2007.

Oil and Gas Projects

- **Cabrillo Port Liquefied Natural Gas (LNG) Deepwater Port, Ventura County, CA.** Under contract to the City of Oxnard, Aspen was tasked to review the Draft EIS/EIR for this the proposed construction and operation of an offshore floating storage and regasification unit (FSRU) that would be moored in Federal waters offshore of Ventura County. As proposed, liquefied natural gas (LNG) from the Pacific basin would be delivered by an LNG Carrier to and offloaded onto, the FSRU; re-gasified; and delivered onshore via two new 21.1-mile (33.8-kilometer), 24-inch (0.6-meter) diameter natural gas pipelines laid on the ocean floor. These pipelines would come onshore at Ormond Beach near Oxnard to connect through proposed new onshore pipelines to the existing Southern California Gas Company intrastate pipeline system to distribute natural gas throughout the Southern California region. Ms. Vahidi reviewed the document for technical adequacy and assisted the City in preparing written comments for the following sections of the EIS/EIR: Aesthetics, Land Use, Recreation, Socio-economics, and Environmental Justice.
- **Long Beach LNG Import Project, Long Beach, CA.** Under contract to the City of Long Beach, Aspen was tasked to review the Draft EIS/EIR for the proposed construction and operation of this onshore LNG facility to be located at the Port of Long Beach. Ms. Vahidi reviewed the document for technical adequacy and assisted the City in preparing written comments for the following sections of the EIS/EIR: Aesthetics, Land Use, Recreation, Socioeconomics, Environmental Justice, and Port Master Plan Amendment.
- **Post-Suspension Activities of the Nine Federal Undeveloped Units and Lease OCS-P 0409, Offshore Southern California, CA.** Aspen assisted the US Department of the Interior, Minerals Management Service (MMS) to prepare an Environmental Information Document (EID) evaluating the potential environmental effects associated with six separate suspensions for undeveloped oil and gas leases Pacific Outer Continental Shelf (OCS) located offshore southern California. These undeveloped leases lie between 3 and 12 miles offshore Santa Barbara, Ventura and southern San Luis Obispo Counties and are grouped into nine units, with one individual lease that is not unitized. As the Senior Aspen social scientist, Ms. Vahidi guided the analysis of community characteristics and tourism resources, recreation, visual resources, social and economic environment, and military operations.
- **Kinder Morgan Concord-Sacramento Pipeline EIR.** Ms. Vahidi prepared the environmental justice and utilities and service systems sections of an EIR evaluating a proposed 70-mile petroleum products pipeline for the California State Lands Commission. Analysis included consideration of potential impacts of pipeline accidents in Contra Costa, Solano, and Yolo Counties.
- **Shore Marine Terminal Lease Consideration Project EIR, Contra Costa County, CA.** Served as Aspen’s Project Manager (under contract to Chambers Group, Inc.) in charge of conducting the preparation of the Land Use, Recreation, Air Quality, and Noise sections of this EIR evaluating Shore Terminal, LLC’s application to the California State Lands Commission (CLSC) to exercise the first of two 10-year lease renewal options, with no change in current operations. Shore Terminals operations comprise the marine terminal and on-land storage facilities in an industrial part of the city of Martinez. The marine terminal is on public land leased from the CSLC with the upland storage facilities located on private land.
- **City of Hermosa Beach Urban Drillsite, Hermosa Beach, CA.** Served as project assistant for Aspen’s contract to assist the City of Hermosa Beach with the review of the risk assessment for the Macpherson Oil Project.

- **Technical Support to NEPA Lawsuit, Angeles National Forest, CA.** Ms. Vahidi prepared a detailed project chronology and a list of all applicable federal, State, and local laws and regulations in support of the USDA Office of General Counsel and National Forest's response to the City of Los Angeles' 1996 lawsuit on the adequacy of the Pacific Pipeline EIS.
- **Yellowstone Pipeline EIS, Lolo National Forest, Montana.** Environmental Justice and Public Services Issue Area Specialist. Responsible for conducting the analysis of project impacts on minority and low-income populations to comply with Presidential Executive Order 12898 on Environmental Justice using Census data to determine population density, minority population percentages and unemployment rates to determine the potential for disproportionate project impacts on affected communities. Also responsible for conducting analysis of project impacts such as population inmigration and pipeline accidents on public services in western Montana. During the EIS scoping process, she served as the project public participation coordinator and was responsible for preparation of the project newsletter, setup of the first round of scoping meetings, and determination of project information centers.
- **Santa Fe Pacific Pipeline Project EIR, Norwalk, CA.** Ms. Vahidi was responsible for development and screening of alternatives for a 13-mile petroleum products pipeline from Carson to Norwalk. Prepared analyses of project impacts on socioeconomics, public services, utilities, and aesthetics.
- **Pacific Pipeline Project Mitigation Monitoring, Compliance, and Reporting Program (MMCRP), Los Angeles and Kern Counties, CA.** Ms. Vahidi served as the expert technical reviewer for the socioeconomics and environmental justice issues. As the MMCRP Agency Liaison, she was responsible for developing protocol for efficient interagency communication procedures in coordination of mitigation activities with the CPUC, USFS, Responsible Agencies, and the project proponent. She was also responsible for the development and management of the MMCRP Community Outreach and Public Access Program.
- **Pacific Pipeline Project EIR, Santa Barbara, Ventura, and Los Angeles Counties, CA.** For the California Public Utilities Commission's (CPUC) EIR on the originally proposed route of this proposed pipeline (from Santa Barbara County to Los Angeles), Ms. Vahidi developed and coordinated a public participation program to comply with CEQA's mandate for information disclosure and public involvement in decision-making. The Final EIR was certified in September 1993.
- **Pacific Pipeline Project EIS and Subsequent EIR, Los Angeles and Kern Counties, CA.** Ms. Vahidi prepared the socioeconomics and public services analysis, the Environmental Justice analysis in compliance with Presidential Executive Order 12898, as well as portions of the Land Use and Public Recreation analyses, including a comprehensive comparative analysis of project alternatives on this EIS/Subsequent EIR for the US Forest Service (Angeles National Forest) and the CPUC. Ms. Vahidi managed the subsequent GIS mapping of socioeconomic data relative to pipeline corridor alternatives and other industrial facilities. She also prepared the cumulative projects list (covering a five county area for the Proposed Project and its alternatives) used for the cumulative scenario analyses of the various issue areas in the EIS/SEIR. As the Public Participation Program Coordinator for the project, she developed, implemented, and managed the public involvement efforts for the NEPA and CEQA environmental review processes. This included: setup and logistics for 20 separate scoping meetings, informational workshops, and public hearings along the project route; preparation of all meeting handouts; preparation of project newsletters and public notices; placement of project documents on Internet; and maintenance of the a project telephone information hotline. She also reviewed over 2,000 public comments (written and verbal) received on the Draft EIS/SEIR, for subsequent distribution to the project team.

FIBER OPTIC PROJECTS

- **MARS EIR/EIS, Monterey Bay, CA.** Ms. Vahidi served as the technical specialist in charge of preparing the Environmental Justice analysis for this EIR/EIS, which would evaluate the effects associated with the installation and operation of the proposed Monterey Accelerated Research System (MARS) Cabled Observatory Project (Project) proposed by Monterey Bay Aquarium Research Institute (MBARI) [NEPA Lead Agency]. The goal of the Project was to install and operate, in State and Federal waters, an advanced cabled observatory in Monterey Bay that would provide a continuous monitoring presence in the Monterey Bay National Marine Sanctuary (MBNMS) as well as serve as the test bed for a state-of-the-art regional ocean observatory, currently one component of the National Science Foundation (NSF) Ocean Observatories Initiative (OOI). The Project would provide real-time communication and continuous power to suites of scientific instruments enabling monitoring of biologically sensitive benthic sites and allowing scientific experiments to be performed. The environmental justice analysis evaluated the potential for any disproportionate project impacts to both land-based populations and fisheries workers. The CEQA Lead Agency was CSLC.
- **Looking Glass Networks Fiber Optic Cable Project IS/MND, several northern and southern California counties.** As part of Aspen's ongoing contract with the CPUC for review of Telecommunications projects, this document encompassed the evaluation of project impacts and network upgrades in the San Francisco Bay Area and the Los Angeles Basin Area. Ms. Vahidi served as the Deputy Project Manager and Study Area Manager for the Los Angeles Basin for this comprehensive CEQA document reviewing the potential impacts of hundreds of miles of newly proposed fiber optic lines throughout northern and southern California, including Los Angeles and Orange Counties. Issues of concern focused on potential construction impacts of linear alignments in highly urbanized rights-of-way, and resultant land use, traffic and utilities conflicts.

OTHER PROJECTS

- **Otay River Watershed Management Plan (ORWMP) and Special Area Management Plan (SAMP), San Diego County, CA.** Ms. Vahidi served as a Technical Senior for social science and land use issues. The ORWMP focused on developing strategies to protect and enhance beneficial uses within this watershed and thereby comply with the San Diego Region's NPDES permit, and the SAMP intended to achieve a balance between reasonable economic development and aquatic resource preservation, enhancement, and restoration in this 145-square-mile (93,000-acre) area through the issuance of Corps and CDFG programmatic permits.
- **US Army Corps of Engineers, Los Angeles District.** Ms. Vahidi is responsible for managing Delivery Orders and conducting the analyses of the social science issue areas for 16 projects throughout southern California and Arizona as part of two environmental services contracts. Delivery orders have included:
  - **Northeast Phoenix Drainage Area Alternatives Analysis Report, Phoenix and Scottsdale, AZ.** As the project manager guided the preparation of an alternatives analysis report that evaluated the potential environmental impacts associated with channel and detention basin alternatives to control flooding problems resulting from fast rate of development in the northeast Phoenix area.
  - **Imperial Beach Shore Protection EIS/EIR, Imperial Beach, CA.** Responsible for preparing the affected environment and environmental consequences sections for the land use, recreation, aesthetics, and socioeconomics issue areas. This EIS will analyze the impacts of shore protection measures along a 4.7-mile stretch of beach in southwest San Diego County.
  - **US Food and Drug Administration Laboratory EIS/EIR, Irvine, CA.** Prepared the land use and recreation; socioeconomics, public services, and utilities; and visual resources/aesthetics analyses

for this proposed "mega-laboratory" on the University of California Irvine Campus. Also developed the cumulative projects scenario for analyses of cumulative impacts. As the Public Participation Coordinator for the EIS/EIR review process, prepared the NOP, set up the scoping meeting and public hearing, prepared meeting handouts, and developed the project mailing list.

- **San Antonio Dam EIS, Los Angeles and San Bernardino Counties, CA.** Responsible for preparing the cultural resources, land use and recreation, and aesthetics sections for the analysis of impacts resulting from the re-operation of San Antonio Dam to increase flood protection.
- **Rio Salado Environmental Restoration EIS, Phoenix and Tempe, AZ.** Conducted the land use and recreation, and aesthetics analyses for this environmental restoration project in the Salt River and Indian Bend Wash located in the Cities of Phoenix and Tempe. Incidental to the primary objective of the Proposed Action (environmental restoration) is the creation of passive recreational opportunities associated with the restored habitat areas, such as trails for walking and biking, and areas for observing wildlife and learning about the natural history of the river.
- **Airspace Restrictions EA, Ft. Irwin, CA.** Conducted the land use, recreation, aesthetics, and socioeconomics analyses of impacts for the conversion of unrestricted airspace to restricted airspace above Ft. Irwin in the Mojave Desert.
- **National Guard Armory Building EA, Los Angeles, CA.** Conducted the land use, aesthetics, and socioeconomics analyses and prepared the cumulative impacts and policy consistency sections.
- **Supplemental EA for the Seven Oaks Dam Woolly Star Land Exchange, San Bernardino County, CA.** Prepared the land use and recreation analyses and policy consistency section.
- **Lower Santa Ana River Operations and Maintenance EA, Orange County, CA.** Responsible for conducting the land use, recreation, aesthetics, socioeconomics, and cultural resources analyses.
- **EA for Area Lighting, Fencing, and Roadways at the International Border, San Diego, CA.** Conducted the land use, aesthetics, and socioeconomics analyses and prepared the policy consistency section.
- **Border Patrol Checkpoint Station EA, San Clemente, CA.** Analyzed the aesthetic impacts of the installation of a concrete center divider and a Pre-inspected Automated Lane adjacent to and parallel to Interstate 5.
- **Upper Newport Bay Environmental Restoration Project, Newport Beach, CA.** Prepared physical setting, socioeconomics, land and water uses, and cultural resources sections for the Baseline Conditions Report and the Environmental Planning Report.
- **Whitewater/Thousand Palms Flood Control Project, Thousand Palms, CA.** Prepared the land use and recreation, aesthetics, and socioeconomics affected environment sections for the project's Baseline Conditions Report that was incorporated into the project EIS.
- **San Antonio Creek Bridges Project, Vandenberg Air Force Base, CA.** Prepared the physical setting, land use, socioeconomics, utilities, and aesthetics sections for analyses of bridge alternative impacts for missile transport on Vandenberg Air Force Base.
- **Ft. Irwin Expansion Mitigation Plan, Mojave Desert, CA.** Responsible for developing Ft. Irwin's Public Access Policy based on mitigation measures from the Army's Land Acquisition EIS for the National Training Center. Policy includes provisions for access by research and scientific uses.

- **Industrywide Survey for the South Coast Air Quality Management District.** Ms. Vahidi coordinated Aspen's work for an Air Toxics Survey of harmful emissions by auto body and paint shops, performed in compliance with AB2588. She was responsible for development of an industrywide emission inventory for these facilities; she also performed information management, facility verifications, survey mail-outs, emissions calculations, analysis of calculated results, and preparation of the final report.

INSTITUTIONAL PROJECTS

- **Los Angeles Unified School District (LAUSD).** Between 2002 and 2008, Ms. Vahidi served as the Program/Contract Manager for Aspen's Environmental Master Services Agreement with the LAUSD (nation's second largest school district) to prepare CEQA documents (EIRs, IS/MNDs, Categorical Exemptions) in review of the LAUSD's four-phased new school construction program intended to meet existing and projected overcrowded conditions (200,000 seat shortfall) within the LAUSD (i.e., City of Los Angeles and all or parts of 28 surrounding jurisdictions cover 700 square miles of land). As the Program Manager, she was responsible for client interface and providing CEQA expertise to the LAUSD on day-to-day basis, QA/QC activities for all Aspen documents submitted, budget tracking and allocation, staff assignments, and the general day-to-day management of this contract. Aspen was awarded 54 work authorizations, of which 48 were CEQA document assignments for new school projects, school expansions and additions. In addition to her duties as the contract manager, Ms. Vahidi managed the preparation of several CEQA documents under this contract, including:
  - **East Valley Middle School No. 2 EIR, Los Angeles, CA.** This middle school was proposed to be located at the previous Van Nuys Drive-In site. The EIR focused on impacts associated with air quality, hazards and hazardous materials, noise, land use and planning, and traffic and transportation. Major issues of concern included traffic and noise generated by school operation activities. The EIR included LAUSD design standards and measures employed to minimize environmental impacts.
  - **Canoga Park New Elementary School IS/MND, Los Angeles, CA.** This elementary school would be developed on a parcel of land owned by the non-profit organization, New Economics For Women (NEW). This "Turn-Key" project consisted of a Charter Elementary School to be developed by NEW and sold to the LAUSD for operation. It was later decided that NEW would lease the school back and run it as a charter school. Issues of concern included, pedestrian safety, traffic, air quality, noise, and land use.
  - **Mt. Washington Elementary School Multi-Purpose Room Addition Project IS/MND Los Angeles, CA.** This project proposed the development of a multi-purpose room facility, including a library, auditorium, and theater, to the existing Mt. Washington Elementary School campus located in Los Angeles. The surrounding residential community had concerns regarding the proposed project's impacts on aesthetics, traffic, air quality, and noise. Of particular concern, were impacts generated due to the after-hours use of the multi-purpose room facility by civic and community groups.
  - **New School Construction Program EIR.** Serves as a Study Area Manager (Valley Districts), and Issue Area Coordinator (IAC) (i.e., technical lead and reviewer) for social science issues, including land use, socioeconomics, public services, population and housing, and utilities and service systems. As the IAC, she has formulated the scope of work and methodology for analysis of issues and mitigation options. In addition to her managerial duties, Ms. Vahidi is preparing the Land Use section of the EIR, and directing the preparation of the Project's Scoping Report.
  - **Belmont Senior High School 20-Classroom Modular Building Addition Project, Los Angeles, CA.** Under Aspen's on-going master services agreement with the LAUSD, served as the project manager for CEQA documentation and permitting efforts related to the addition of modular classrooms to the existing Belmont Senior High School campus. Issues of concern included,

potential impacts to sensitive receptors adjacent to the school from construction-related air quality, noise, and traffic, and operation-related noise generated by the new classrooms. As the LAUSD's CEQA consultant, Ms. Vahidi directed the preparation of technical documentation in support of a Class 32 In-Fill CEQA Categorical Exemption. This technical documentation included analyses of potential project-related air quality, noise, and traffic impacts, which were then submitted to LAUSD as one packet. Subsequent to preparation of this packet, LAUSD filed a CEQA Notice of Exemption for the classroom addition project.

- **Narbonne High School Stadium Lighting Project MND Addendum, Los Angeles, CA.** Served as the project manager for this project proposed to add a new stadium, lighting, and associated sport facilities needed to address existing needs at Narbonne High School. Issues of concern include lighting impacts to the surrounding neighborhood, and available parking stock.

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- **Program EIR for the Divestiture of PG&E's Hydroelectric Generation Assets.** For the CPUC's EIR evaluating the Pacific Gas & Electric Company's (PG&E) proposal to divest their hydroelectric facilities in California, served as the land use technical analyst for two watershed areas, and the Task Manager for the Socioeconomics and Transportation sections of the EIR covering five watershed areas. PG&E owns and operates the largest private hydroelectric power system in the nation. Situated in the Sierra Nevada, Southern Cascade, and Coastal mountain ranges of California, this system is strung along 16 different river basins and annually generates approximately five percent of the power consumed each year in California. The proposed sale of assets also includes approximately 140,000 acres of land proposed for sale with the hydroelectric system. The EIR analyzes the range of operational changes that could occur under new ownership, including complex integrated models that analyze power generation and water management. The land use section of the EIR examines the implications of the change in ownership of lands and the potential for impacts due to development or potential changes in use. Contributed significantly to the extensive GIS analysis, which was conducted to determine the development suitability and potential intensity of development that might occur on the lands if sold. These results served as one of the primary bases for analysis of impacts associated with the sale of the hydroelectric assets.
- **Section 108 Loan Guarantee EA/FONSI for the Waterfront Development Project, Huntington Beach, CA.** Served as the Manager and Principal Preparer for this EA/FONSI for the City of Huntington Beach Economic Development Department. Prepared NEPA documentation evaluating the impacts resulting from the use of HUD Section 108 Loan guarantee funds for the Waterfront Resort Expansion Project in accordance with The HUD NEPA Guidelines and Format 1 (Environmental Assessments at the Community Level). Tasks included: (1) Evaluation of activities that would be categorically excluded from NEPA based on an assessment of the NEPA Implementing Guidelines for HUD Projects; (2) Evaluation of proposed actions compliance with all applicable federal statutes, regulations, and policies; and (3) Preparation of an Environmental Assessment/Mitigated Finding of No Significant Impact (EA/FONSI) for proposed actions that are not categorically excluded. Proposed actions to be evaluated consisted mainly of infrastructure improvement projects, rehabilitation and/or development of affordable housing, provision of relocation assistance, facilitation of development and/or redevelopment plans, property acquisition, provision of open space, etc.
- **MTA Mid Cities/Westside Transit Corridor Study EIS/EIR, Los Angeles, Beverly Hills, and Santa Monica, CA.** Served as the EIS/EIR Deputy Project Manager (DPM) for this 3-phase (including prepared the Major Investment Study (MIS), the Environmental Impact Statement (EIS), and an evaluation of the urban design implications of transit interventions on selected routes) study intended to address current and long range traffic congestion in the central and westside areas of the

Los Angeles, Basin. Three east/west corridors and a range of transit alternatives ranging including Rapid Bus, light rail, and heavy rail are being evaluated. In addition to her duties as DPM for this comprehensive joint EIS/EIR, Ms. Vahidi prepared the Environmental Justice Analysis (per Executive Order 12898), the Section 4(f) Parklands discussion, and the land use and socioeconomics sections of the EIS/EIR.

- **Wes Thompson Ranch Development Project EIR, Santa Clarita, CA.** Served as the EIR Project Manager for this hillside residential development in the City of Santa Clarita. Issues of concern included seismic and air quality impacts associated with the excavation of 2 million cubic yards of soil, the project's non-compliance with the City's hillside ordinance for innovative design, and traffic generated by project-related population growth in the area. Four different site configuration alternatives were developed as part of the EIR analysis. Other issues of concern included sensitive biological resources, the potential for hydrological impacts due to disturbance of the hillside, and cultural resources.

- **City of Santa Monica Environmental Assessments.** As one of the City's qualified CEQA consultants managed several environmental assessment documents for housing, commercial, institutional, and mixed-use developments in compliance with CEQA, including:

  - **Berkeley Manor Condominium EIR and Technical Reports.** This one-issue EIR originally was a CEQA Categorical Exemption per direction of the City. During preparation of the Categorical Exemption documentation, it was determined that project-generated traffic would have potentially significant impacts. As a result, a traffic technical report was prepared as the background document for and EIR. In addition, shade and shadow impacts were evaluated in a technical report to ensure that shading impacts from the proposed structure on surrounding uses would not be significant. A simple Excel model was developed for calculation of shade and shadow angles.

  - **Seaview Court Condominiums IS/MND.** This comprehensive Initial Study/Mitigated Negative Declaration included six technical reports including traffic, cultural resources, parking survey, shade and shadow analysis, and a geotechnical assessment to evaluate the level of severity of this development in the waterfront area of Santa Monica. Major issues of concern were; parking and project-generated traffic on adjacent narrow residential streets; visual obstruction and shading impacts of the proposed structure; liquefaction and seismic impacts to adjacent properties as result of the project's excavation for a subterranean parking garage; and the potential impacts of the project to impact the integrity of a historic district and the historic Seaview Walkway to the beachfront.

  - **Four-Story Hotel IS/MND.** A comprehensive Initial Study/Mitigated Negative Declaration was prepared for this four-story hotel adjacent to St. John's Hospital in Santa Monica. Major issues of concern included project-generated traffic on surrounding multi-family residential uses and emergency access to the hospital.

  - **Santa Monica College Parking Structure B Replacement EIR.** This focused EIR addressed issues related to traffic and neighborhood land use impacts associated with the addition of a 3-story parking structure in the center of the SMC campus. Major issues of concern included the potential for project-generated traffic to cause congestion at the school's main entrance on Pico Boulevard, and the potential for overflow traffic to impact the Sunset Community of single-family homes adjacent to the school.

  - **North Main Street Mixed-Use Development Project EIR.** This EIR included evaluation of impacts resulting from the development of a mixed-use development in Santa Monica's "Commercial

Corridor" on Main Street, with ground-floor residences and boutique commercial uses. Major issues of concern included traffic and parking impacts to Main Street and surrounding residential land uses, shade and shadow impacts, and neighborhood impacts.

- **Specific Plans and Redevelopment Projects.** As the senior technical lead for land use, prepared the project description, alternatives screening and development, cumulative scenario, and land use analysis for:
  - **Cabrillo Plaza Specific Plan EIR, Santa Barbara, CA.** This project consisted of a mixed-use commercial development on Santa Barbara's waterfront on Cabrillo Boulevard. On-site uses included an aquarium, specialty retail, restaurants, and office space.
  - **Culver City Redevelopment Plan and Merger EIR, Culver City, CA.** This programmatic EIR evaluated the impacts of the City's redevelopment of its redevelopment zones. A major land use survey and calculation of acreage of redevelopment lands was conducted as part of the EIR.
  - **Dana Point Headlands Specific Plan EIR, Dana Point, CA.** This EIR evaluated the development of coastal bluff in the City with hotel, single- and multi-family residential, and commercial uses. Major issues of concern included ground disturbance as a result of excavation, impacts to terrestrial and wildlife biology, recreation impacts to beachgoers, and project-generated population inducement.
  - **Blocks 104/105 Redevelopment Project EIR, Huntington Beach, CA.** This EIR evaluated the development of a supermarket, retail shops, and office space in the City's Waterfront Redevelopment Zone. Issues of concern evaluated included traffic, land use, and impacts to on-site historic structures. Ms. Vahidi served as EIR Project Manager.

Honors and Awards

- 2013 California Association of Environmental Professionals, Outstanding Award for Environmental Analysis for the Ocotillo Wind Energy Farm EIS/EIR
- 2006 American Planning Association, Los Angeles Section Environmental Award for the Los Angeles Unified School District New School Construction Program, Program EIR
- 2004 Association of Environmental Professionals Statewide Best EIR Award for the Jefferson-Martin 230-kV Transmission Project EIR
- 2001 Outstanding Performance Award from the State of California Energy Commission
- 1992-93 recipient of the USC Merit ("Ides of March") Scholarship from the Southern California Association of Public Administrators (SCAPA)
- University of California, Irvine, School of Social Sciences. Graduated with Highest Honors in Political Science.

Professional Associations

- American Planning Association (APA), Los Angeles Section Executive Board Member 1999-2001
- Association of Environmental Professionals (AEP)

DECLARATION OF
Eric Veerkamp

I, **Eric Veerkamp,** 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 Engineering Geologist.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I prepared the staff testimony on **Compliance Conditions** for the **Huntington Beach Energy Project Final Staff Assessment,** based on my independent analysis of the Application for Certification and supplement hereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: 4/28/2014 Signed: [signature]

At: Sacramento, California

ERIC W. VEERKAMP, AICP
Compliance Project Manager

EDUCATION
B.S. Business Administration (Human Resources Mgmt.); Minor in Environmental Studies

PROF. AFFILIATIONS
American Institute of Certified Planners (AICP), American Planning Association (APA), Association of Professionals (AEP), Toastmaster International (past member)

COMMUNITY INVOLVEMENT
California Academic Decathlon volunteer, 2009; St. Robert School parent volunteer

Mr. Veerkamp has over 22 years of Planning, Environmental, and Project Management experience.

PLANNER III, COMPLIANCE PROJECT MANAGER
California Energy Commission (June 2011 – Present)

Mr. Veerkamp is currently the Compliance Project Manager for the Genesis Solar Energy Project (GSEP), which is currently under construction, approximately 70% complete. Mr. Veerkamp also has Compliance oversight responsibility on operational projects, including Metcalf, Colusa, Sunrise, Starwood, Metcalf, and Palmdale

PLANNER II
California Energy Commission (September 2010 – June 2011)

Mr. Veerkamp drafted the Land Use Preliminary Staff Assessment for the Hydrogen Energy, California (HECA) project, and the Final Staff Assessment for the Transmission Line Alternatives Analysis, supplementing the Traffic and Transportation Section for the Palmdale Hybrid Power Plant (PHPP). Mr. Veerkamp was also been assigned Traffic and Transportation and Visual compliance responsibilities for G.W. Tracy and Land Use and Socioeconomic compliance for Sutter.

INDEPENDENT CONTRACTOR
EData Corporation. (2010)

Drafted CEQA sections for proposed Jamul Indian Village commercial project in San Diego County, including Traffic and Transportation Alternatives Analysis, Visual Resources, and Land Use. Review and respond to public agency comments on NEPA EIS for proposed Soboba Tribal gaming facility, also in San Diego County.

SENIOR ASSOCIATE
Raney Planning & Management, Inc. (2006 – 2010)

With Raney Planning & Management, Inc., Mr. Veerkamp served as Housing Element Project Manager. Clients included the Cities of Calexico, El Centro, Brawley, Colfax, Hollister, and Oroville. Mr. Veerkamp also assisted with preparation of CEQA environmental documents, served the City of Wheatland as contract planning staff; and managed prevailing wage contracts for Laurin Associates (a division of Raney). Accomplishments include preparing an award winning City-wide Visioning document for the City of Wheatland, and a growth management rating system for the City of Hollister.

DECLARATION OF
Casey Weaver

I, **Casey Weaver,** 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 Engineering Geologist.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I prepared the staff testimony on **Geology and Paleontology** for the **Huntington Beach Energy Project Final Staff Assessment,** based on my independent analysis of the Application for Certification and supplement hereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: Casey [signature] Signed: 4/28/14

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
Scott D. White

I, **Scott D. White,** declare as follows:

1. I am presently employed by Aspen Environmental Group, consultant to the California Energy Commission's Engineering Office of the Siting, Transmission and Environmental Protection Division as an Associate Biologist.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I prepared the staff testimony on **Biological Resources** for the **Huntington Beach Energy Project Final Staff Assessment,** based on my independent analysis of the Application for Certification and supplement hereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: May 9 2014 Signed: Scott D W

At: Upland, California

SCOTT D. WHITE
Senior Associate/Senior Biologist

Academic Background

MA, Biology, Humboldt State University, 1992
BA, Biology, Humboldt State University, 1981
Secondary Teaching Credential, Life Science, 1982

Professional Experience

Scott D. White holds Bachelor's and Master's degrees in biology from Humboldt State University and has 26 years of experience managing and writing field survey reports, impact assessments, and mitigation plans. He is an expert with southern California botany, plant communities, and habitat. He is a coauthor of *Vascular Plants of Western Riverside County: An Annotated Checklist*, he has instructed botany and vegetation field courses for Rancho Santa Ana Botanic Garden and other nonprofit foundations, and he serves as a peer reviewer for US Fish and Wildlife Service publications. He has extensive experience in evaluating wildlife habitat suitability and project impacts for threatened and endangered species. His regulatory, permitting, and compliance expertise includes NEPA, CEQA, state and federal Endangered Species Acts, and state and federal wetlands and streambed regulation. Mr. White worked for several years as a subcontractor to Aspen, and joined the firm in 2009 as the Inland Empire office manager. At Aspen his projects have included biological resources analyses for CEQA and NEPA, state and federal ESA consultation, programmatic conservation plans, and Migratory Bird Treaty Act and Bald and Golden Eagle Protection Act compliance. Other projects have included design and implementation of monitoring plans and land management plans, data analysis of native vegetation, streambed delineations, mitigation plans for state and federal permitting, focused surveys for rare plants and wildlife, revegetation planning, recovery planning for threatened or endangered species, and long-term land use planning on public and private lands. Mr. White provides expert witness testimony and supports client legal staff in case review and preparation of briefs. He has extensive experience with federal, state and local agency coordination, and he has published a number of studies in professional literature.

Aspen Environmental Group..2009-present

Selected project experience at Aspen includes the following:

California Energy Commission

- **Rio Mesa Solar Electric Generating Facility (2011-2013).** Mr. White collaborated with CEC project management, resource, and legal staff in project review and analysis, public workshops, and coordination among CDFW, BLM, and USFWS to review biological resource impacts. Mr. White coauthored the CEQA analysis of Biological Resources published in CEC's Preliminary Staff Assessment. The Rio Mesa solar thermal project would have developed approximately 3,960 acres in the Colorado Desert, in eastern Riverside County, using two "power tower" technology generators. Important biological resources issues included listed threatened or endangered wildlife (desert tortoise, Gila woodpecker); technology hazard for migratory birds; and desert dry wash woodland habitat. The applicant, Brightsource Energy, suspended the project in January 2013.
- **Calico Solar Project (2009-2011).** Mr. White collaborated with CEC project management, resource, and legal staff in project review and analysis, public workshops, coordination among CDFW, BLM, and USFWS, and coauthored the CEQA analysis of Biological Resources published in CEC's Staff Assessment and Supplemental Staff Assessment. Both documents included California Fish and Game Code §1600 Streambed and §2081 Incidental Take review for the threatened desert tortoise. Mr. White provided expert testimony in Evidentiary Hearings; and provided review and comments to the Commission's Proposed Decision. Following project authorization, Mr. White supported CEC legal

staff in responses to California Supreme Court filings by Sierra Club and California Unions for Reliable Energy. The Calico Solar project, as reviewed and approved by the Energy Commission, would develop solar facilities using Sterling "SunCatcher" technology on approximately 4,200 acres in the central Mojave Desert, San Bernardino County. Important biological resources issues included desert tortoise, rare plant species, and wildlife habitat connectivity.

- **Rice Solar Energy Project (2009-2010).** Mr. White collaborated with CEC project management, resource, and legal staff in project review and analysis, public workshops, coordination among CDFW, BLM, and USFWS, and coauthored the CEQA/NEPA analysis of Biological Resources published in Staff Assessment/DEIS with Western Area Power Administration as the NEPA lead agency. The SA/DEIS included review pursuant to California Fish and Game Code §1600 Streambed analysis and §2081 Incidental Take analysis for the threatened desert tortoise. The Rice Solar project would develop solar thermal facilities on approximately 1,500 acres in the Colorado Desert, in eastern Riverside County using "power tower" technology. Important biological resources issues included the threatened desert tortoise, migratory birds, and wildlife habitat connectivity.

California Public Utilities Commission

- **Devers – Palo Verde II Transmission Project (2010-ongoing).** Mr. White provides review and revision recommendations to CPUC regarding mitigation plans, variance requests, and monitoring reports pursuant to mitigation requirements of the EIR/EIS, and state and federal Endangered Species Act incidental take permits. Compliance review includes extensive coordination with CPUC, SCE, CDFW, BLM, and USFWS staff. The DPV2 Transmission Project will deliver solar energy generated in the low desert area to southern California load centers. Aspen was responsible for preparing the joint EIR/EIS for the CPUC and BLM, and is responsible for CPUC compliance monitoring during SCE's construction of the approximately 150-mile DPV2 Transmission Project between Blythe and Menifee, Riverside County.
- **Colorado River Substation (2011-ongoing).** Mr. White and the Aspen team prepared biological impacts analysis and mitigation planning for the CPUC's Supplemental EIR for the Colorado River Substation. The substation was originally a part of the DPV2 project, but its design was expanded to accommodate newly approved and proposed solar thermal generation plants in the area, and its location was changed to reduce on-site and downwind impacts to windblown sand habitat occupied by the sensitive Mojave fringe-toed lizard and special-status plants. Subsequent to CPUC's approval, Mr. White and the Aspen team continue to serve as CPUC staff in project compliance and construction monitoring. The substation will be located near Blythe in eastern Riverside County.
- **Desert Sunlight Solar Farm / Red Bluff Substation EIS (2011).** Mr. White and the Aspen team coordinated with CPUC project management and legal staff to review and revise an EIS prepared by the BLM's consultant, to address CEQA adequacy under §15221 of the CEQA Guidelines. Mr. White contributed extensive comments on the Administrative DEIS and DEIS, and extensive revisions to the Administrative FEIS immediately before its publication, to ensure CEQA compliance. The Desert Sunlight Solar Farm is a 550 MW solar photovoltaic power plant on BLM land near Desert Center in eastern Riverside County; the EIS included the Red Bluff Substation as a project component. Important biological resource issues include desert tortoise and wildlife habitat connectivity.
- **Tehachapi Renewable Transmission Project EIR/EIS (2008-ongoing).** Mr. White provides review and revision recommendations to CPUC regarding mitigation plans, variance requests, and monitoring reports pursuant to mitigation requirements of the EIR/EIS, and state and federal Endangered Species Act incidental take permits. Compliance review includes extensive coordination with CPUC, SCE, CDFW, USFS, and USFWS staff. In preparation of the EIR/EIS, Mr. White surveyed the proposed transmission line corridor and alternate alignments and assessed project impacts for rare,

threatened, and endangered plants in the Chino Hills, Puente Hills, San Gabriel Mountains, Los Angeles Basin, and Inland Empire areas, Los Angeles, Orange, San Bernardino, and Riverside Counties. Aspen was responsible for preparing a joint EIR/EIS for the CPUC and USFS, and is responsible for CPUC compliance monitoring, for an extensive series of transmission system upgrades which will increase transmission system capacity and reliability in order to allow wind energy generated in the Tehachapi area to be delivered to southern California load centers.

Western Area Power Administration Desert Southwest Region. Aspen is under contract to Western's Desert Southwest Region to support NEPA analysis and compliance for projects throughout the region. Mr. White has managed biological resources analysis for several projects in California, Arizona, and Nevada, including:

- **Gila – North Gila Transmission Line Rebuild and Upgrade Project (2013).**
- **Blythe – Knob Transmission Line Maintenance Project (2012).**
- **Davis to Nora McDowell Transmission Line Rebuild Project (2011).**
- **ED #2 - Saguaro #1 Biological Resources Report (2011).**
- **Black Point Communication Facility Biological Resources Report (2011).**

Other Selected Projects

- **Belectric Solar Projects (2013).** Mr. White managed technical staff and coauthored Biological Resources Technical Reports for several small scale solar photovoltaic projects in San Bernardino, Riverside, and Kings counties. Important biological resources included desert tortoise, Swainson's hawk, and San Joaquin kit fox.
- **Desert Harvest Solar Project EIS (2010-ongoing).** Mr. White managed staff and subcontractors to compile data and prepare the Biological Resources sections and supporting documents for the BLM's EIS analyzing enXco's proposed 1,200 acre solar photovoltaic project, near Desert Center, Riverside County, California. Mr. White managed and authored or coauthored analyses and documentation to support consultation and permitting for compliance with state and federal Endangered Species Acts, CDFW Lake and Streambed Alteration Agreement program, and federal Bald and Golden Eagle Protection Act, in coordination with BLM, CDFW, and USFWS. Documents Mr. White managed or prepared with the Aspen Team included: (1) Biological Resources Technical Report to support the EIS, (2) Desert Tortoise Translocation Plan and draft Biological Assessment to support BLM Section 7 consultation with USFWS, (3) Jurisdictional Delineation to support state streambed permitting, (4) Bird and Bat Conservation Strategy to support consultation with USFWS, and (5) Integrated Weed Management Plan to support BLM's NEPA review. Important biological resources issues include desert tortoise and golden eagle.
- **California Valley Solar Ranch (2011-ongoing).** Under Aspen's contract to San Luis Obispo County Mr. White provided review and comment on a series of field survey reports and mitigation plans addressing biological resources, to ensure conformance with the County's Conditions of Approval for the project. Major issues of concern included planning and mitigation for listed threatened or endangered species (giant kangaroo rat, San Joaquin kit fox), other special-status species, and timely completion of review/revision and approvals to meet the developer's construction schedule. The project is a 250 MW solar photovoltaic power plant on the Carrizo Plain in rural San Luis Obispo County.

- **Alta–Oak Creek Mojave Project EIR, Kern County, Biological Resources Data Review, Vegetation Mapping, Rare Plant Surveys and Impacts Analysis (2008-2009).** Mr. White managed field work and authored reports to review and update the applicant's botanical surveys and vegetation maps and descriptions. Mr. White also analyzed project impacts to rare plants including the endangered Bakersfield cactus. Aspen was under contract to Kern County to prepare an EIR for the proposed 800 MW wind energy facility.
- **Santa Ana River Marsh Management Plan, US Army Corps of Engineers (Corps), Project Manager and Plan Author (2009-ongoing).** As Project Manager and Plan Author under Aspen's ID/IQ contract Task Order to the USACE, Mr. White managed staff and subcontractors to compile data and prepare a management plan for the Santa Ana River Marsh site in Orange County. The site is a restored wetland, supporting listed species including nesting Belding's savannah sparrow and light-footed clapper rail, and foraging habitat for California least tern. Plan preparation included review of restoration success to date, and developing long-term management goals and monitoring strategy, including adaptive management, to implement the goals. The Corps purchased the property and conducted habitat restoration work in the 1990s; surrounding land uses necessitate a long-term habitat management plan.
- **Newhall Ranch CEQA Consultation Services, California Department of Fish and Wildlife (CDFW), Biological Resources Analysis and CDFW CEQA review (2006-2010).** Mr. White and the Aspen team supported CDFW staff in reviewing and revising analyses of biological resources the Newhall Ranch Specific Plan in the preparation of an EIR/EIS with CDFW and the USACE as lead agencies. Mr. White also provided review, revision, and analysis of the project's supporting documents for state and federal wetlands and streambed permitting and incidental take authorization for listed threatened and endangered species, including San Fernando Valley spineflower. The Specific Plan covers approximately 12,000 acres in northwestern Los Angeles County near the City of Santa Clarita. The CDFW contracted with Aspen for assistance in administering the EIR process and to provide expert technical review services for all issue areas.

Scott White Biological Consulting and other firms 1989-2009

Consulting Biologist: Scott White Biological Consulting; White & Leatherman BioServices 1998-2009; Psomas and Associates, 1995-1998; Tierra Madre Consultants 1989-1995. Mr. White performed biological surveys, report preparation (to meet requirements of CEQA, NEPA, SMARA, state and federal wetlands requirements, and local planning policies), client contact, and agency coordination. Specialties include rare plant surveys, wetlands delineations, vegetation sampling and description, habitat characterization (e.g., suitability for rare wildlife species), revegetation planning, and mitigation design.

Botanist: San Bernardino National Forest 1987-1989

Team leader for data collection and assisted in data analysis for vegetation management planning and ecosystem classification; assisted in analysis and interpretation of vegetation data, leading to a classification system of southern California chaparral; provided mapping and implementation recommendations for prescribed burn planning and other habitat management projects; assisted in vegetation sampling of California spotted owl territories; prepared Environmental Assessments in compliance with NEPA.

DECLARATION OF
Lisa Worrall

I, **Lisa Worrall,** 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 Engineering Geologist.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I prepared the staff testimony on **Socioeconomics** for the **Huntington Beach Energy Project Final Staff Assessment,** based on my independent analysis of the Application for Certification and supplement hereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue addressed therein.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: April 17, 2014 Signed: Lisa Worrall

At: Sacramento, California

LISA WORRALL

Summary

- 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

Preparation Team

HUNTINGTON BEACH ENERGY PROJECT (12-AFC-02)
FINAL STAFF ASSESSMENT
PREPARATION TEAM

Executive Summary .... Felicia Miller

Introduction .... Felicia Miller

Project Description .... Felicia Miller

Environmental Assessment

Air Quality.. Tao Jiang, Ph.D., P.E.

Air Quality Appendix Air-1 – Greenhouse Gas Emissions ....
.... Tao Jiang, Ph.D., P.E. and David Vidaver

Biological Resources............................Heather Blair, Jennifer Lancaster and Scott D. White

Biological Resources Appendix BIO-1 – Nitrogen Deposition Analysis.............................
.... Tao Jiang, Ph.D., P.E. and Wenjun Qian, Ph.D., P.E.

Cultural Resources..Melissa Mourkas and Gabriel Roark

Hazardous Materials Management .... Geoff Lesh, P.E.

Land Use... Steven Kerr

Noise and Vibration..Edward Brady and Shahab Khoshmashrab

Noise Appendix A – Fundamental Concepts of Community Noise ....
....Edward Brady and Shahab Khoshmashrab

Public Health .... Huei-An (Ann) Chu, Ph.D.

Socioeconomics .... Lisa Worrall

Soil and Water Resources.. Mike Conway, P.G.

Traffic and Transportation .... Jonathan Fong

Appendix TT-1 – Plume Velocity Analysis .... Tao Jiang, Ph.D, P.E.

Transmission Line Safety and Nuisance .... Obed Odoemelam, Ph.D.

Visual Resources .... Jeanine Hinde

Waste Management .... Ellen Townsend-Hough

Worker Safety and Fire Protection .... Geoff Lesh, P.E.

Engineering Assessment

Facility Design ....Edward Brady and Shahab Khoshmashrab

Geology and Paleontology .... Casey Weaver, CEG

Power Plant Efficiency..Edward Brady and Shahab Khoshmashrab

Power Plant Reliability..Edward Brady and Shahab Khoshmashrab

Transmission System Engineering... Mark Hesters and Laiping Ng

Alternatives...Scott Debauche and Negar Vahidi

Compliance Conditions .... Eric Veerkamp

Project Assistant... Alicia Campos