EL SEGUNDO ENERGY CENTER
PETITION TO AMEND
(00-AFC-14C)

SUBMITTED BY

EL SEGUNDO ENERGY CENTER LLC

nrg

WITH TECHNICAL ASSISTANCE FROM

CH2MHILL

APRIL 2013

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Acronyms and Abbreviations

°F	Fahrenheit
$\mu g/m^3$	micrograms per cubic meter
ACM	asbestos-containing materials
AFC	Application for Certification
AFY	acre-feet per year
APCD	air pollution control district
ARMR	Archaeological Resource Management Report
BMP	Best Management Practice
BRMIMP	Biological Resources Mitigation Implementation and Monitoring Plan
CAA	Clean Air Act
CAAQS	California Ambient Air Quality Standards
CAISO	California Independent System Operator
CalEEMod	California Emissions Estimator Model
CAM	Compliance Assurance Monitoring
CARB	California Air Resources Board
CBO	Chief Building Official
CCR	California Code of Regulations
CCS	carbon control and capture system
CEC	California Energy Commission
CEM	continuous emission monitoring
CESFD	City of El Segundo Fire Department
CFR	Code of Federal Regulations
CHRIS	California Historic Resource Information System
CMBFD	City of Manhattan Beach Fire Department
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
CO	carbon monoxide
CO_2	carbon dioxide
COC	Condition of Certification
CPUC	California Public Utilities Commission
CRHR	California Register of Historic Resources
CRM	cultural resource monitor
CRMMP	Cultural Resources Monitoring and Mitigation Plan

CRR	Cultural Resource Report
CRS	Cultural Resources Specialist
CSS	Construction Safety Supervisor
CT	Combustion Turbine
CTG	combustion turbine generator
DCS	digital control and monitoring system
DESC	Drainage, Erosion, and Sediment Control Plan
DLE	dry low emission
DLN/DLE	dry low-NOx/dry low emissions
DOC	Determination of Compliance
DPM	diesel particulate matter
EPA	U.S. Environmental Protection Agency
EPS	Emissions Performance Standard
ERC	emission reduction credits
ESEC	El Segundo Energy Center
ESEC LLC	El Segundo Energy Center LLC
ESGS	El Segundo Generating Station
ESPFM	Segundo Power Facility Modification
ESPR	El Segundo Power Redevelopment Project
FAA	Federal Aviation Administration
FDOC	Final Determination of Compliance
GEP	Good Engineering Practices
GHG	greenhouse gas
GTG	gas turbine generator
H&SC	Health & Safety Code
HAPs	hazardous air pollutants
HARP	CARB's Hotspots Analysis and Reporting Program
HMI	Human Machine Interface
HOV	Occupancy Vehicle
HRA	health risk assessment
HRSG	heat recovery steam generator
I/O	input/output
ISI	Inlet Spray Inter-Cooling
KOP	Key Observation Point
L50	ambient median noise level

LAER	lowest achievable emission rate
LAMTA	Los Angeles County Metropolitan Transportation Authority
LARWQCB	Los Angeles Regional Water Quality Control Board
LAX	Los Angeles International Airport
LGIA	Large Generator Interconnect Agreement
LORS	laws, ordinances, regulations, and standards
LOS	level of service
MCR	Monthly Compliance Report
MEI	Maximum Exposed Individual
MEIR	existing Residential receptor
MLLW	mean lower low water
msl	mean sea level
MW	megawatts
NAAQS	Ambient Air Quality Standards
NAD83	UTM North American Datum 1983
NANSR	Nonattainment New Source Review
NED	National Elevation Dataset
NESHAPS	National Emission Standards for Hazardous Air Pollutants
NFPA	National Fire Protection Association
NH_3	ammonia
NO_2	nitrogen dioxide
NOx	oxides of nitrogen
NPDES	National Pollutant Discharge Elimination System
NRG	NRG Energy, Inc
NSPS	Standards of Performance for New Stationary Sources
NSR	New Source Review
O_3	ozone
OEHHA	Office of Environmental Health Hazard Assessment
PAH	polycyclic aromatic hydrocarbon
PDOC	Preliminary Determination of Compliance
PM_{10}	particulate matter less than 10 microns in diameter
$PM_{2.5}$	particulate matter less than 2.5 microns in diameter
PMI	point of maximum impact
ppm	parts per million
PRM	Paleontological Resource Monitors

PRMMP	Paleontological Resources Monitoring and Mitigation Plan
PRR	Paleontological Resources Report
PRS	Paleontological Resource Specialist
PSD	Prevention of Significant Deterioration
PTA	Petition to Amend
PTC	Permit to Construct
PTO	Permit to Operate
RBM	Regulated Building Materials
REL	Reference Exposure Level
RMP	Risk Management Plan
RO	reverse osmosis
ROU	receptor-output
RPS	Renewable Portfolio Standard
SCAQMD	South Coast Air Quality Management District
SCE	Southern California Edison
scf	standard cubic feet
SCR	selective catalytic reduction system
SCRTD	Southern California Rapid Transit District
SHPO	State Historic Preservation Officer
SIL	significance impact level
SIP	State Implementation Plan
SO_2	sulfur dioxide
SoCalGas	Southern California Gas
SOx	sulfur oxides
STG	steam turbine generator
SUSMP	Standard Urban Stormwater Mitigation Plan
SVP	Society of Vertebrate Paleontologists
SWPPP	Storm Water Pollution Prevention Plan
SWRCB	State Water Resources Control Board
TAC	toxic air contaminants
T-BACT	Toxics Best Available Control Technology
THI	total hazard index
TPY	Ton(s) per year
TSP	total suspended particulate
USC	United States Code

USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
VOC	volatile organic compounds
VOC	Volatile organic compounds
WEAP	Worker Environmental Awareness Program
WPCD	Water Pollution Control Drawing

SECTION 1.0
Executive Summary

1.1 Project Overview

El Segundo Energy Center LLC (ESEC LLC), the Project Owner, a wholly owned subsidiary of NRG Energy, Inc (NRG), proposes to modify the El Segundo Energy Center (ESEC), 00-AFC-14C, Final Decision to make substantial changes to the ESEC. Chief among these changes is the replacement of two once-through-cooled boiler units, Units 3 and 4, with modern and efficient, dry-cooled, natural-gas-fired combustion gas turbine units. This change will eliminate the use of ocean water for once-through cooling at the facility. The proposed changes will also upgrade and improve the ESEC's existing and approved site infrastructure, and provide fast start and dispatch flexibility capabilities to support southern California grid load balancing and renewable energy integration, and implement improvements to coastal access.

Specific changes proposed through this Petition to Amend (PTA) include:

- Shutdown and demolition of Units 3 and 4
- Removal and remediation of existing ESEC retention basins
- Change in location for the permitted (but not yet constructed) administration building to a lower elevation
- Construction of a new, combined administration, maintenance, and operations support building
- Modifications to existing site access
- Improvements to beach access

The following new major equipment will be installed:

- One NRG fast start combined-cycle unit (CC Fast™), rated at 325 megawatts (MW) net, incorporating a General Electric 7FA.05 natural gas turbine
- Two Rolls Royce Trent 60 DLE ISI, rated at 55 MW/unit net, consisting of advanced aeroderivative simple-cycle gas turbines
- One Cleaver Brooks 36 MMBtu/hr auxiliary boiler

Table 1-1 lists the technical areas addressed in this PTA and those areas where the Project Owner is requesting changes to the 00-AFC-14C Final Decision, including subsequent amendments, and the Conditions of Certification (COC) that are currently in effect. The details of the proposed changes to the COCs can be found in the appropriate technical areas in this PTA.

The environmental analysis in Section 3.0 concludes that the proposed changes to the ESEC will not create or cause any unmitigated significant environmental impacts nor create any issues regarding compliance with applicable laws, ordinances, regulations, and standards (LORS).

TABLE 1-1
Technical Sections with New or Modified Conditions of Certification

Technical Area	New or Revised COCs	Technical Area	New or Revised COCs
Air Quality	Yes	Traffic and Transportation	No
Biological Resources	Yes	Visual Resources	Yes
Cultural Resources	Yes	Waste Management	No
Hazardous Materials Management	No	Worker Safety/Fire Protection	No
Land Use	Yes	Facility Design	Yes
Noise and Vibration	No	Geology and Paleontology	Yes
Public Health	Yes	Power Plant Efficiency	Yes
Soil and Water Resources	Yes	Power Plant Reliability	Yes
Socioeconomic Resources	No	Transmission System Engineering	Yes
Transmission Line Safety and Nuisance	No		

1.2 Overview of Proposed Changes

ESEC LLC has proposed the El Segundo Power Facility Modification (ESPFM) as the modification of the licensed ESEC. This PTA describes the respective modifications and additions to the ESEC. The ESPFM will provide fast-start and dispatch flexibility capabilities through the installation Units 9, 10, 11, and 12, adding approximately 435 MW (net) / 449 MW (gross) of new generation to the existing 560 MW (net) / 573 MW (gross) ESEC, identified as Units 5 through 8. Operation of Units 5 through 8 and proposed Units 9 through 12 will result in a total generating capacity of approximately 995 MW (net) / 1,022 MW (gross). The net rated energy that would be transmitted from the ESEC as proposed by this PTA is 995 MW, consistent with the Large Generator Interconnect Agreements (LGIA) filed with the California Independent System Operator (CAISO) for ESEC and ESPFM. The net rated capacity of previously retired Units 1 and 2 (demolished and retired as part of 00-AFC-14) and Units 3 and 4 (proposed for demolition and retirement as part of this PTA) is 1,020 MW; gross generation of Units 1 through 4 has been approximately 1,052 MW. Table 1-2A lists the gross and net generating capacities of Units 1 through 12. This table is being presented to identify turbine ratings which reflect differences in total megawatts generated as a result of presenting the gross or net outputs. Table 1-2B summarizes the demolition, retirement, and replacement generating capacity associated with the removal of Units 1 through 4 and the installation of Units 5 through 12.

These additions are subject to the California Energy Commission's (CEC) Siting Regulations Section 1769 requirements. The ESPFM includes a combination of advanced, efficient simple-cycle units and an advanced combined-cycle train with the overall thermal efficiency and low emissions of traditional combined-cycle units with fast-start capabilities similar to peaking units. These units will significantly reduce the amount of startup emissions to deliver electricity to the grid, and the installation of dry-cooling will eliminate the intake and discharge of ocean water required for once-through-cooling.

The timing for implementation of the ESEC (00-AFC-14C) will result in shut-down of Unit 3 within 90 days of first-fire of Unit 5, or by June 30, 2013, and shutdown of Unit 4 in mid-2015 to coincide with the State of California's once-through-cooling policy for El Segundo Generating Station with a stated compliance obligation of December 31, 2015. Commencement of demolition of Units 3 and 4 is planned for the end of 2015. Construction of the proposed ESPFM is anticipated to commence by mid-2016, after Units 3 and 4 are removed, and conclude in 2018 to meet a projected on-line date of summer 2018. The existing cessation of generation from Units 3 and 4, followed by their demolition, and proposed ESPFM construction, operation, and generation are subject to an approved power purchase agreement.

TABLE 1-2A
Unit Output Ratings (gross and net MW)

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

TABLE 1-2B
Retirement/Replacement Summary

Retired/To Be Retired	Capacity	Cycle	Replacement/Capacity
Units 1 and 2	175 MW/each for a total of 350 MW	Steam Boiler	Units 5 and 6 and Units 7 and 8 as two trains of combined cycle = 573 MW gross
Unit 3*	335 MW	Steam Boiler	
Unit 4	335 MW	Steam Boiler	Units 9 and 10 as combined cycle and Units 11 and 12 as advanced gas turbines = 435 MW net rating
TOTAL	**Retired: 1,020 MW (net)**		**New: 1,022 MW (gross)**

*The installation of Units 5, 6, 7, and 8 (gross 573 MW) required the use of the combined 350 MW from Units 1 and 2, and 223 MW of the 335 MW available from Unit 3. The remaining 112 MW associated with the total MW capacity of Unit 3 will be used to meet the installed capacity for Units 9, 10, 11, and 12 (435 MW net / 449 MW gross). Nominal rating of ESPFM is approximately 440 MW.

Due to the nominal ratings of the turbines, adding the MW together, the facility is less than 1,020 MW (573 MW + 440 MW). For planning purposes, ESEC LLC has assumed that it is a MW – MW replacement project.

1.3 Project Location

The El Segundo Generating Station (ESGS; the site of the facility), as originally named by the former owner Southern California Edison (SCE), is a natural-gas-fired electric power generating station located at 301 Vista Del Mar Boulevard in El Segundo, California. Figure 1-1 provides a location map and Figures 1-2a and 1.2b provide a site layout map. The site is located at the southernmost city limit of El Segundo on the coast of the Pacific Ocean between Dockweiler State Beach and the city of Manhattan Beach. It is located less than a 0.25 mile south of the Los Angeles Department of Water and Power's Scattergood power plant and 0.5 mile south of the City of Los Angeles' Hyperion Wastewater Treatment Plant. The Chevron El Segundo refinery is located across Vista Del Mar. The city of Manhattan Beach is immediately to the south. The ESGS is located approximately 2.5 miles southwest of the Los Angeles International Airport and west of the San Diego Freeway (I-405) on the eastern shore of Santa Monica Bay. The site is bordered by Vista Del Mar and the Chevron refinery to the east, 45th Street in the city of Manhattan Beach on the south, Santa Monica Bay on the west, and the Chevron Marine Terminal on the north. Electricity generated from the 33-acre site is transmitted to the adjoining SCE switchyard that is physically within the fenced boundary of the facility.

1.4 Project History and Overview of PTA Request

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

1.5 June 2007 PTA

Subsequent to the issuance of the CEC Final Decision in February 2005, on June 18, 2007, the project owner (by this time a wholly owned subsidiary of NRG Energy) submitted a PTA requesting the addition of new state-of-the-art Rapid Response Combined Cycle (R2C2) technology that was not available during the original proceedings for 00-AFC-14. R2C2 technology provides extremely fast starts and can achieve thermal efficiency of combined-cycle units while significantly reducing startup emissions delivering electricity more quickly to the grid. This new technology eliminated the need for once-through cooling by replacing these units with air-cooled condensers. The R2C2 technology also eliminated the need for wastewater discharge to the ocean or to a publicly owned treatment plant. Other modifications included in the 2007 PTA included changes in the method and route for oversize equipment delivery; modification of the plant entrance road to allow for oversize equipment delivery and improved plant access; and modifications to the construction laydown areas. The project owner was also changed in August 2008 to El Segundo Energy Center LLC.

In June 2008, the CEC issued its Staff Assessment Report, and in October 2008 issued its Addendum I Staff Assessment Report. The CEC analysis in the respective staff assessment reports noted legal challenges to the availability of South Coast Air Quality Management District (SCAQMD) -provided air emission offsets through SCAQMD Rules 1304 and 1315, which corresponding delayed the CEC and SCAQMD from completing their approvals of the June 2007 PTA. Regulatory and legislative resolution in January 2010 enabled SCAQMD to issue permits that relied on air emission offsets through application of Rules 1304 and 1315. Processing of the June 2007 PTA resumed in 2010, during which ESEC LLC filed a PTA Supplement to expand the scope of the June 2007 PTA request to include the permanent shutdown and closure-in-place of Unit 3 to ensure the necessary air emission offsets; the PTA Supplement was supported by additional analysis of the requested modification and the potential effects on environmental resources as compared to the previous evaluations (CEC Final Decision [00-AFC-14], 2007 PTA, June 2008 CEC Staff Assessment Report, and October 2008 Addendum I Staff Assessment Report). The expanded PTA Supplement also included proposed changes to the approved COCs. As part of this request, Unit 3 was proposed to be maintained cosmetically and structurally to ensure that it did not become an eyesore or a safety hazard. In addition, the natural gas supply was proposed to be permanently disconnected and hazardous materials storage and use associated with Unit 3 operations (e.g., lube oil, ammonia for air emissions control) was to be eliminated and/or permanently disconnected. The shutdown of Unit 3 would have also resulted in a reduction of ammonia consumption and deliveries, but would not reduce storage quantity. This Amendment was approved by the CEC on June 30, 2010.

1.6 April 2012 PTA COC Revisions for Ammonia Use and Facility Name Change

Subsequent to the PTA Supplement described above, and in order to effectuate the changes in ammonia usage and facility name, on April 17, 2012, ESEC LLC submitted a PTA requesting to modify the range of ammonia injection rates, eliminate a venturi scrubber, eliminate the ammonia supply pipeline from Chevron, and change the project name. These changes were approved by the CEC on August 9, 2012, and the facility name was changed to the El Segundo Energy Center (ESEC).

1.7 Consistency of 2013 Amendment with License

With this 2013 PTA, ESEC LLC requests to decommission, demolish, and remove existing Units 3 and 4 (currently generating up to 670 MW net) and add fast-start and dispatch flexibility capabilities through the addition of one NRG rapid response 1 x 1, 325 MW net (334 MW gross) combined cycle unit ("CC Fast" incorporating one General Electric [GE] 7FA.05 natural gas turbine and one steam turbine, operating in combined-cycle mode), plus two advanced simple-cycle aeroderivative gas turbines (55 MW net / 58 MW gross each). In addition, new generation would also include an auxiliary boiler rated at 36 MMBtu/hr integrated into the CC Fast operation. The new generating units will be fitted with best available control technology (BACT). For the gas turbines, BACT will include dry low-NOx combustors, selective catalytic reduction (SCR), an oxidation catalyst, and will use clean-burning natural gas fuel. The Trent 60 units will include multiple compressors and intercooling for improved efficiency and to support reduced air emissions. The ESPFM layout is shown in Figures 1-2a and 1-2b.

Section 1769(a)(1)(D) of the CEC Siting Regulations requires a discussion of the amendment's consistency with the requisite LORS and whether the additions are based on new information that changes or undermines the assumptions, rationale, findings, or other bases of the CEC Final Decision for 00-AFC-14. If the project is no longer consistent with the license, an explanation of why the additions should be permitted must be provided. The following sections address the required explanation, rationale, and LORS compliance analysis for the proposed ESPFM. Proposed changes to the existing COCs are discussed as part of the impacts analyses in Section 3.0. In completing the environmental analysis required to comply with Section 1769, the Project Owner requests that relevant information from the 00-AFC-14 and subsequent PTAs proceedings be incorporated by reference [CCR 1704 (a) (2)].

1.8 Necessity of Proposed Change

Sections 1769(a)(1)(B) and 1769(a)(1)(C) of the CEC Siting Regulations require a discussion of the necessity for the proposed changes to the project and whether this modification is based on information known by the petitioner during the certification proceeding. The purpose of this 2013 PTA is to decommission, demolish, and add fast-start and dispatch flexibility capabilities through the installation of 435 MW net / 449 MW gross of more efficient generating units. This PTA proposes the replacement of steam boilers scheduled to retire by December 31, 2015, to meet the State's once-through-cooling policy compliance deadline for El Segundo Generating Station. This new generation at this location is critical to meet in-basin needs pending shutdown of other once-through-cooling units in the Los Angeles Basin, and the need for fast-start generation to integrate renewable generation in the Los Angeles Basin.

1.9 Cumulative Impacts

Each issue area discussion in Section 3.0 addresses the cumulative environmental effects from the proposed ESPFM. This discussion concludes that implementation of the ESPFM will not result in significant, unmitigated cumulative impacts, and the assumptions or conclusions made in the CEC Final Decision (00-AFC-14) will not change.

1.10 Compliance with Laws, Regulations, Ordinances and Standards

The CEC Final Decision (00-AFC-14) concluded that the El Segundo Power Replacement Project complied with all applicable LORS. As discussed in detail in Section 3.0, the proposed ESPFM will not affect the ability to comply with all applicable LORS.

1.11 Document Organization

Pursuant to Section 1769 of the CEC Siting Regulations, the environmental analysis conducted for the ESPFM relies upon relevant information from the 00-AFC-14 proceedings to describe unchanged baseline conditions and project components and includes the following sections.

Section 1.0	Introduction
Section 2.0	Project Description
Section 3.0	Environmental Analysis: updates to baseline conditions, evaluation of potential environmental impacts as compared to the CEC Final Decision (00-AFC-14), subsequent PTAs, current LORS, revisions to COCs, and references to updated technical data to support the environmental analyses
Section 4.0	Potential Effects on the Public
Section 5.0	List of Property Owners
Section 6.0	Potential Effects on Property Owners
Appendix 3.1A	Air Quality Technical Information
Appendix 3.8A	Public Health Technical Information

1.12 Schedule

The proposed schedule for this 2013 ESEC PTA is as follows:

- March 2013: Project Owner files application for a Permit to Construct, and for a Prevention of Significant Deterioration (PSD) Permit, with SCAQMD
- April 2013: Project Owner files 2013 ESEC PTA with CEC
- April 2013: Project Owner submits air emission modeling and health risk assessment modeling to SCAQMD to support application processing
- May – October 2013: CEC Staff reviews PTA and issues data requests and holds public workshops, if needed.
- November 2013: Project Owner receives Preliminary Determination of Compliance (PDOC) from SCAQMD and conducts Title V Public Workshop
- February 2014: Project Owner receives CEC Staff Assessment Report
- April 2014: Project Owner receives Final Determination of Compliance (FDOC) from SCAQMD
- June 2014: CEC Staff and Siting Committee Hearings
- July 2014: CEC Issues Final Staff Assessment
- August 2014: CEC Board Meeting to hear 2013 PTA
- September 2014: Title V Major Modification approval and NPDES final approval 2014 concurrent with CEC approvals, to incorporate Units 9 through 12 in the Title V Facility Permit and include process water discharge changes in the facility NPDES Permit

1.13 Necessity for the Proposed Modifications

The modifications proposed in this 2013 PTA are necessary to:

1. Maximize use of limited existing air offsets by replacing older generating equipment with new low-emission combustion turbine equipment that will significantly reduce air pollutant emissions as compared to the boilers they are replacing, pursuant to SQAQMD Rule 1304.

2. Redevelop brownfield site in close proximity to existing infrastructure.
3. Install air-cooled condenser and eliminate need for once-through ocean water cooling process.
4. Remove existing once-through cooling process at ESGS as a means to meet the State's once-through cooling policy, consistent with ESGS's stated OTC Implementation Plan to retire Units 3 and 4 by December 31, 2015, and replace the generation via Track 1 compliance path.
5. Provide grid stability to accommodate increased renewable energy generation by adding dispatch capabilities to accommodate planned and unplanned grid outages in response to excessive demands and natural disasters.
6. Incorporate visual elements into facility design consistent with the ESEC license and subsequent PTAs related to 00-AFC-14C that considers community input.
7. Integrate community-defined site improvements, including improvements to pedestrian/bicycle use of bike path, landscaping and frontage improvements.
8. Improve fire, emergency, public safety, and environmental protections through installation and operation of new more efficient generating units.
9. Improve public access through implementation of existing COCs LAND- 9 through LAND-11.

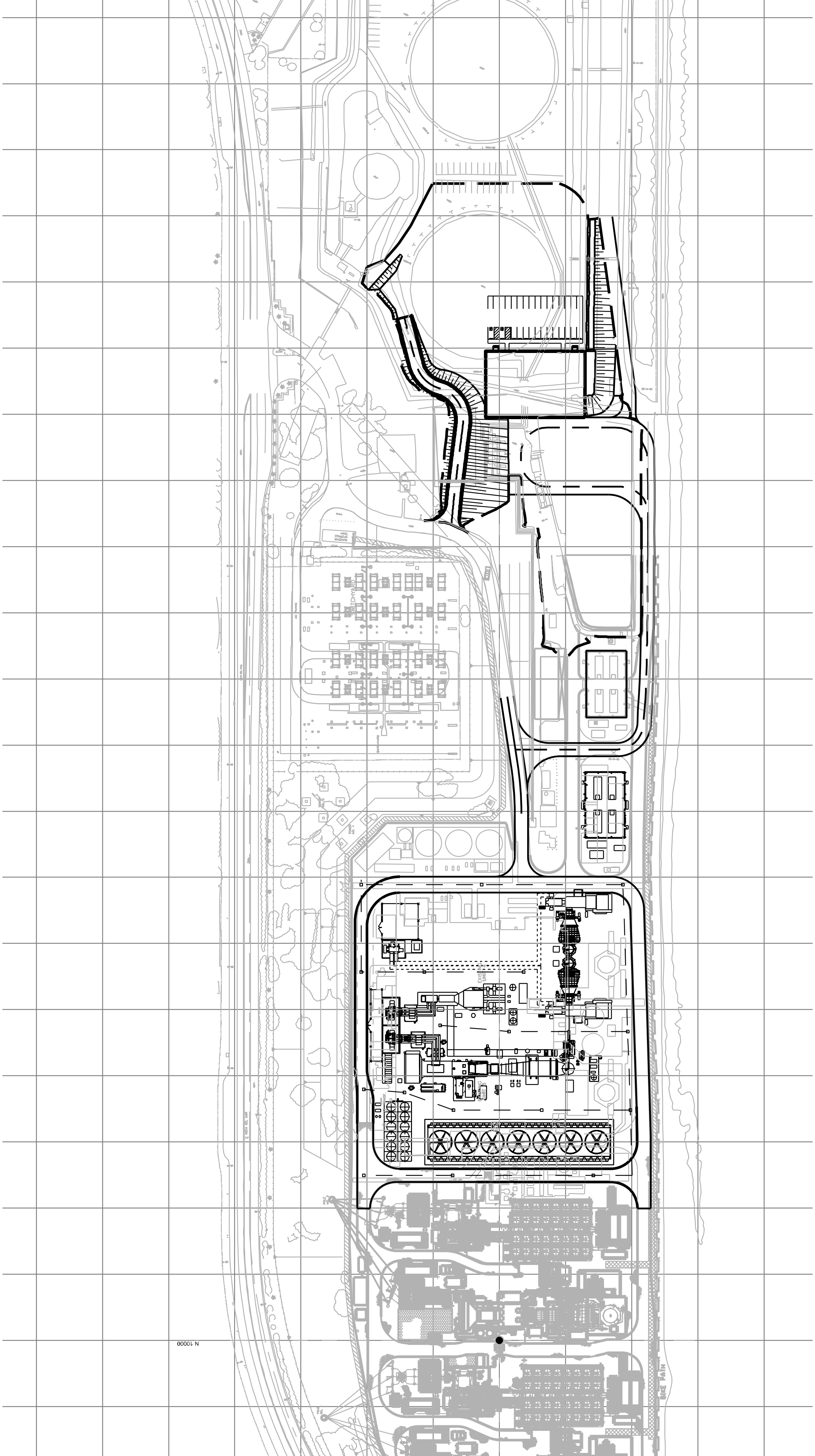
1.14 Project Ownership

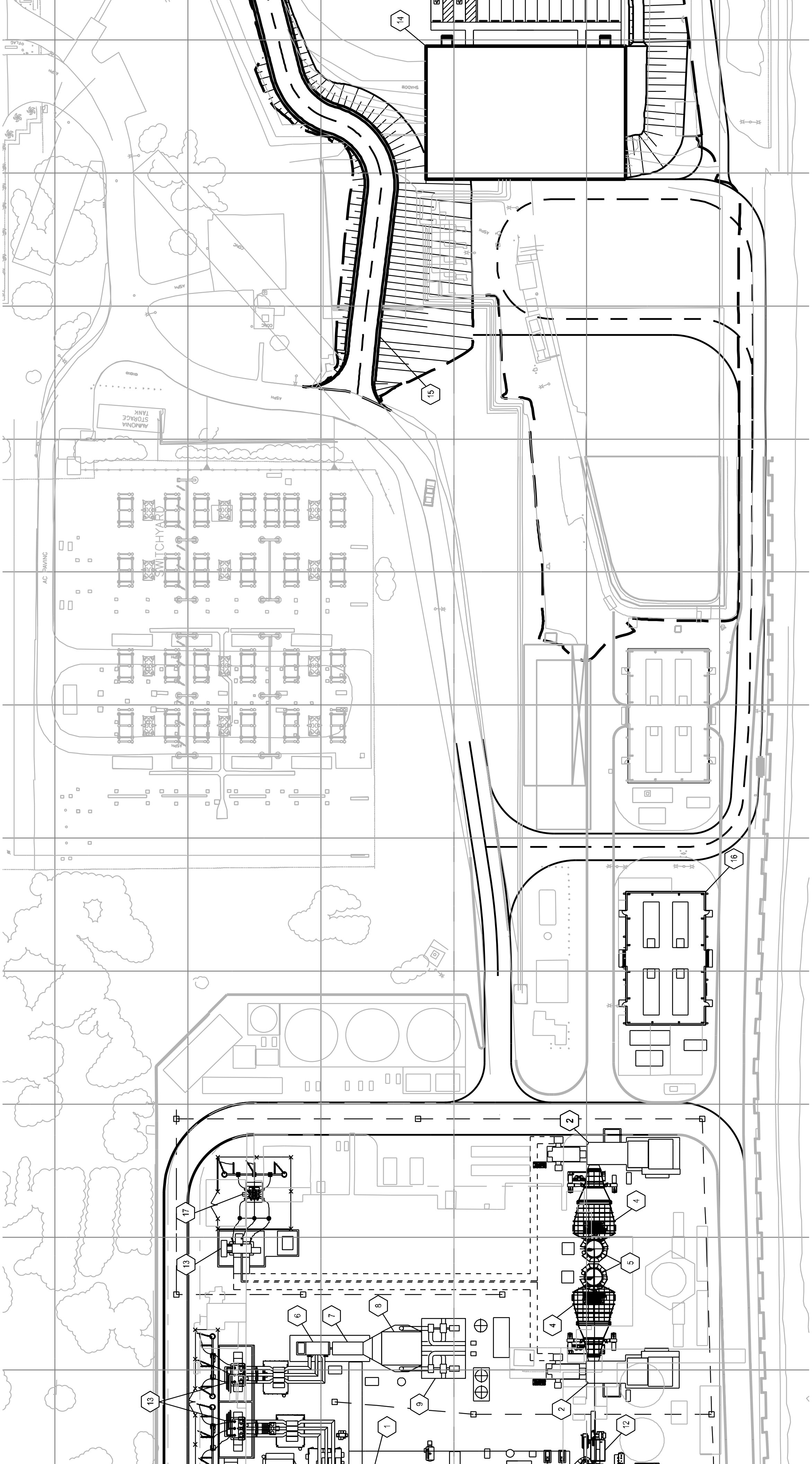
The Project Owner for the ESPFM is El Segundo Energy Center LLC (referred to herein as project owner or ESEC LLC). ESEC LLC is a wholly owned subsidiary of NRG Energy, Inc.

1.15 Recommendations and Conclusions

Based on the analysis included in this 2013 PTA, all direct, indirect, and cumulative impacts of the ESPFM on health, safety, and the environment will remain less than significant with the amended COCs from 00-AFC-14C, and the proposed additions will further reduce potential impacts in technical areas as compared to the CEC Final Decision (00-AFC-14).

FIGURE 1-1
Vicinity Map
El Segundo Power Facility Modification
April 2013 Petition to Amend 00-AFC-14
El Segundo, California


N 10000
BIKE PATH



SWITCHYARD
AMMONIA STORAGE TANK
AC PAVING
ASPH
14
15
16
17
13
2
4
5
6
7
8
9
1
12

SECTION 2.0

Project Description

2.1 Introduction

El Segundo Energy Center LLC (ESEC LLC), the project owner, a wholly owned subsidiary of NRG Energy, Inc (NRG), proposes to modify the El Segundo Energy Center (ESEC), 00-AFC-14C, Final Decision to make substantial changes to ESEC. Chief among these changes is the replacement of two once-through-cooled boiler units, Units 3 and 4, with modern and efficient, dry-cooled, natural-gas-fired combustion gas turbine units. This change will eliminate the use of ocean water for once-through cooling at the facility. The proposed changes will also upgrade and improve ESEC's existing and approved site infrastructure, and provide fast start and dispatch flexibility capabilities to support southern California grid load balancing and renewable energy integration, and implement improvements to coastal access.

Specific changes proposed through this Petition to Amend (PTA) include:

- Shutdown and demolition of Units 3 and 4
- Removal and remediation of existing ESEC retention basins
- Change in location for the permitted (but not yet constructed) administration building to a lower elevation
- Construction of a new, combined administration, maintenance, and operations support building
- Modifications to existing site access
- Improvements to beach access along the facility's southern property boundary

The following new major equipment will be installed:

- One NRG fast start combined-cycle unit ("CC Fast"), rated at 325 MW net, incorporating a General Electric 7FA.05 natural gas turbine
- Two Rolls Royce Trent 60 DLE ISI, rated at 55 MW/unit net, consisting of advanced aeroderivative simple-cycle gas turbines
- One Cleaver Brooks 36 MMBtu/hr auxiliary boiler

This upgrade, called the El Segundo Power Facility Modification (ESPFM), requires a PTA because the ability to employ this technology was not possible during the AFC process as a result of engineering and SCQAMD rule constraints. Recent changes to SCAQMD air emission regulations now facilitate the ability for the project owner to request these upgrades and maintain compliance with air emission limits.

The CC Fast generating unit is capable of fast starts—comparable to peaking units—and has the overall thermal efficiency and low emissions of combined-cycle units. The advanced Trent 60 generating units are capable of fast starts and provide dispatch flexibility. When combined, this configuration would significantly reduce startup emissions and enable greater capacity and faster delivery of electricity to the to the southern California grid.

The ESPFM will provide fast-start and dispatch flexibility capabilities through the installation Units 9, 10, 11, and 12, adding approximately 435 MW (net) / 449 MW (gross) of new generation to the existing 560 MW (net) / 573 MW (gross) ESEC, identified as Units 5 through 8. Operation of Units 5 through 8 and proposed Units 9 through 12 will result in a total generating capacity of approximately 995 MW (net) / 1,022 MW (gross), The net rated energy that would be transmitted from ESEC as proposed by this PTA is 995 MW, consistent with the LGIAs filed with the CAISO for ESEC and ESPFM. As shown in Tables 1-2A and 1-2B, the net rated capacity of previously retired Units 1 and 2 (demolished and retired as part of 00-AFC-14) and Units 3 and 4 (proposed for demolition and retirement as part of this PTA) is 1020 MW; gross generation of Units 1 through 4 has been approximately 1052 MW.

The timing for Implementation of the ESEC (00-AFC-14C) will result in shut-down of Unit 3 within 90 days of first-fire of Unit 5, or by June 30, 2013, and shutdown of Unit 4 in mid-2015 to coincide with the State of California's once-through-cooling policy for El Segundo Generating Station (ESGS) with a stated compliance obligation of December 31, 2015. Commencement of demolition of Units 3 and 4 is planned for the end of 2015. Construction of the proposed ESPFM is anticipated to commence by mid-2016, after Units 3 and 4 are removed, and conclude in 2018 to meet a projected on-line date of summer 2018. The existing cessation of generation from Units 3 and 4, followed by their demolition, and proposed ESPFM construction, operation, and generation are subject to an approved power purchase agreement.

2.1.1 Ongoing Construction

The project owner is currently completing construction of the ESEC project consistent with the 2005 CEC Final Decision and the subsequent amendments. The approved ESEC facilities are shown in Figure 2-1, and additional information is provided in Section 2.8.11

2.1.2 Project Location

ESGS is an existing 1950s natural-gas-fired electric power generating station, originally owned by Southern California Edison (SCE) until 1998; it is located at 301 Vista Del Mar Boulevard in El Segundo, California. Figure 1-1 provides a location map and Figure 1-2 provides a site layout map. The site is located at the southernmost city limit of the city of El Segundo on the coast of the Pacific Ocean between Dockweiler State Beach and the city of Manhattan Beach. ESGS is approximately 2.5 miles southwest of the Los Angeles International Airport and west of the San Diego Freeway (I-405) on the eastern shore of Santa Monica Bay. It is located less than 0.25 mile south of the Los Angeles Department of Water and Power's Scattergood Generating Station, and approximately 0.5 mile south of the City of Los Angeles' Hyperion Wastewater Treatment Plant. The power plant site is bordered by Vista Del Mar and the Chevron refinery to the east, 45th Street in the city of Manhattan Beach on the south, Santa Monica Bay on the west, and the Chevron Marine Terminal on the north. ESGS consists of approximately 33 acres surrounded by an 8-foot-high chain link fence topped with barbed wire. The electricity generated from steam boiler Units 3 and 4 and the ESEC (upon completion) is transmitted to the adjoining SCE switchyard that is physically within the fenced boundary of ESGS and is itself surrounded by its own fencing.

The site is located at Township 3 South, Range 15 West, on the Venice U.S. Geological Survey (USGS) quadrangle map. There is no applicable USGS section number. The site includes three parcels. Existing Units 3 and 4 are located on APN 4138-029-002, a parcel approximately 24.7 acres in size. The existing SCE substation is located on APN 4138-029-800, a parcel approximately 2.25 acres in size, owned by SCE. A list of existing property owners within 1,000 feet of the ESPFM is included in Section 5.0.

The eastern portion of the site consists of a cut slope approximately 70 feet high that descends from Vista Del Mar Boulevard and the existing main entrance gate to the lower elevation of the power blocks. Predominant existing structures include; power blocks with steam boiler Units 3 and 4 and ESEC Units 5 through 8, ocean water intake/outfall structure, administration office trailers, temporary construction trailers, paved roadways and parking areas, transformers, and the retention basin. The power blocks contain the turbines, generators, operator control room, turbine lube oil system, air pollution control devices, multi-level steel boiler structures, and multiple electrical transformers.

2.1.3 Topography

As shown in Figure 2-2, the northern end of the site has been developed with ESEC Units 5 through 8 and the adjacent Units 3 and 4, which exist at varying elevations of 18 feet to 20 feet mean lower low water (MLLW). Units 3 and 4 reside at the proposed ESPFM location. The existing topography at the south end of the site slopes downward from the entrance road to the retention basin and existing fuel oil tank area at a 1.5 to 1 slope. Elevations vary from a high point at the gatehouse of 90 feet above mean sea level (msl) down to 39 feet msl at the fuel tank area and 20 feet msl at the retention basin area. The existing fuel oil tank area is level and is surrounded by an earthen containment berm.

The final grade for the new power block area, as shown in Figure 2-3, will be similar to the existing grade. The power block complex will be at a level elevation of 20 feet msl and the top of pavement will slope down at the drop inlet locations to 18 feet msl. The final grade for the fuel oil tank area, as shown in Figure 2-3, will be similar to the existing topography with grades sloping from 40 feet msl down to new drop inlets at 38 feet msl. The existing earthen berm will remain unchanged except that a portion of the berm along the west side will be removed to allow road access into the tank area. A new administration/maintenance building is proposed to be located at the northern portion of the tank farm area in proximity of the current location of the retention basin. Excavated soils from the northern portion of the tank farm area are proposed to be used for road fill during construction of the access road.

2.1.4 Geologic Setting and Seismology

The geology, seismic setting, and soil conditions at the site are summarized herein and discussed in detail in Section 5.3 of the AFC (00-AFC-14); incorporated herein by reference). The site is located in the southwestern portion of the Los Angeles Structural Basin, which forms the transition between the northern portion of the Peninsular Ranges Physiographic Province and the southern portion of the Transverse Ranges Physiographic Province of California. The Peninsular Range Province is characterized by northwest-trending mountains and valleys formed largely by a system of active right-lateral, strike-slip faults with a similar trend. The Transverse Range Province is characterized by east-west-trending mountains and intervening valleys that were formed by a series of east-west-trending fold belts and active left-lateral reverse and thrust faults. Over geologic time, the site has been influenced by fluvial, marine, and littoral depositional processes as sea levels have risen and fallen and as tectonic forces have changed the regional landscape. The site is underlain by a thick, interbedded sequence of Quaternary clays, silts, sands, and gravels. These quaternary deposits are underlain by Tertiary sedimentary rocks, including claystones, siltstones, and sandstones. Schist and gneissic basement rocks lie beneath the sedimentary rocks at depths of about 6,700 feet.

2.2 Facility Design

2.2.1 Equipment Technology

The CC-Fast technology includes a one on one (1x1) rapid start air-cooled combined-cycle gas turbine plant designed in-house by NRG in collaboration with GE for peaking and intermediate duty service. Table 2-1 includes the dimensions of each of the major components of the new generating systems. The combination of these turbines and auxiliary boiler was designed specifically for load balancing and providing firming capacity in support of renewable such as wind and solar.

The CC-Fast plant uses a GE 7FA platform and includes the following power block components:

- One NRG fast start combined-cycle unit (CC Fast), rated at 325 MW net, incorporating a General Electric 7FA.05 natural gas combustion turbine generator (CTG) designed to achieve 75 percent of base load output in 10 minutes
- Two-pressure duct-fired heat recovery steam generator (HRSG) designed for rapid startup with conventional SCR/carbon monoxide (CO) catalysts
- One Heller dry cooling tower system

In addition to the CC Fast technology, the project owner is also proposing to additional peaking capacity and load balancing that includes:

- Two Rolls Royce Trent 60 DLE ISI, rated at 55 MW/unit net, consisting of advanced aeroderivative simple-cycle gas turbines
- One single-case non-reheat axial exhaust admission condensing steam turbine generator (STG) designed for non-traditional elevated condensing pressure to minimize cooling system size
- One Cleaver Brooks 36 MMBtu/hr auxiliary boiler consisting of a direct contact spray condenser and a mechanically induced draft dry-cooling tower

While these packages do not operate in combined-cycle mode, they use Inlet Spray Inter-Cooling (ISI) systems to increase output and improve efficiency. Tables 2-2 through 2-4 list the components specifications (GE, Trent 60, and auxiliary boiler) and Figures 2-4 and 2-5 show a conceptual diagram of the system. These units are designed with a modular concept to allow for quick installation and ease of maintenance in the field. Each module is fully assembled and tested before shipment. The gas turbine base plate holds the required oil system to allow installation, testing, and flushing in a shop environment. This greatly reduces site installation time. The control system is designed to allow for easy site installation by using remote input/output (I/O) technology to decrease the number of interconnect cables between the unit control panel and the equipment skids. All train control systems are then accessed by a Human Machine Interface (HMI), which will be located in the main control room. Due to the Trent 60's aircraft engine lineage, maintenance of the engine can be accomplished quickly and easily. The Trent engine is designed to facilitate quick turnarounds. The advantage of using a Trent engine is that it can be split into interchangeable modules for increased generation flexibility. These modules include:

- Low-pressure compressor
- Intermediate and high-pressure compressors and turbines
- Low-pressure turbine

Operating with dry low emission (DLE) technology, the Trent 60 engine is designed to comply with stringent environmental requirements. DLE uses eight radial staged combustors to accomplish operational flexibility in part load operations while still maintaining oxides of nitrogen (NOx) and CO emissions limits. Each engine is designed to produce 52 MW of power. Each of the three proposed CTGs will be equipped with dry low-NOx combustors, an SCR system for the control of NOx emissions, and an oxidation catalyst for the control of CO. The existing 20,000-gallon ammonia (NH_3) storage tank at the facility (storing 29 percent aqueous ammonia) will be used to supply aqueous ammonia to the CTG SCR systems.

The CC Fast unit requires a source of steam while off-line in order to utilize its fast start capability. The steam keeps the system in a state of readiness, reducing the startup time. Steam will be provided by a 36 MMBtu/hr auxiliary boiler, which will be fully integrated into the CC Fast. Specifications for the auxiliary boiler are shown in Table 2-4.

TABLE 2-1
Dimensions of Significant Structures

	Dimensions (FT)		
Structure	**Height**	**Length**	**Width**
NEW STRUCTURES			
Combined Cycle Turbine			
Combustion Turbines	25	102	23
HRSGs (New), Tier 1	80.0	107	35
CTG Inlet	70	51	27
Simple Cycle Turbines			
Trent60 CTG x 2	15	104	31
CTG to Stack Transition x2	35	48	36
Other equipment			
Main Aux Transformer	30	42	26
Fin-Fan Cooler	29	93	44
Elect Room	10	44	17
Steam Transformer	30	42	26
Steam Turbine	20	100	32
Cooling Tower	67	232	53

TABLE 2-1
Dimensions of Significant Structures

Structure	Dimensions (FT)		
	Height	Length	Width
EXISTING STRUCTURES			
Combined Cycle Turbine Associated Structure x2			
Tier 1	32	233	32
Tier 2	76	46	36
Tier 3	88	98	23
Air Cooled Heat Exchanger X2	26	138	85
Steam Turbine Generator X2	29	61	22

Note: Table B-1 NRG El Segundo building dimensions used for air quality modeling.

TABLE 2-2
GE Fast-Start Gas Turbine Specifications

Parameter	Specification
Manufacturer/Refurbishing Company	GE
Model	7FA.05 10-minute start
Fuel Type	California Public Utilities Commission (CPUC) Quality Natural Gas
Natural Gas Heating Value	1,030 MMBtu/scf
Gas Turbine Heat Input (HHV)	2,168 MMBtu/hr at 41°F ambient (peak load)
Duct Burner Heat Input (HHV)	268 MMBtu/hr at 41°F ambient (peak load)
Fuel Consumption	2.365 MMscf/hr*
HRSG Exhaust Flow	859,000 DSCFM at 41°F ambient (peak load)
HRSG Exhaust Temperature	219°F at 41°F ambient (peak load)
Gas Turbine Power Generation	222 MW (nominal - gross)
Steam Turbine Power Generation	112 MW (nominal - gross)
Total Power Generation	Up to 334 MW (nominal – gross)

*Represents maximum possible fuel consumption of the CTG, based on 2436 MMBTU/hr heat input and 1,030 MMBtu/scf fuel heat content.

TABLE 2-3
Trent 60 Gas Turbine Specifications (Per Turbine)

Parameter	Specifications
Manufacturer/Refurbishing Company	Rolls Royce
Model	Trent 60
Fuel Type	CPUC Quality Natural Gas
Natural Gas Heating Value	1,030 MMBtu/scf
Gas Turbine Heat Input (HHV)	516 MMBtu/hr at 78°F ambient (peak load)
Fuel Consumption	0.500 MMscf/hr*
Gas Turbine Exhaust Flow	257,000 DSCFM at 78°F ambient (peak load)
Gas Turbine Exhaust Temperature	809°F at 78°F ambient (peak load)
Gas Turbine Power Generation	57.4 MW (nominal - gross)

*Represents the maximum possible fuel consumption of the CTG, based on 516 MMBTU/hr heat input and 1,030 MMBTU/scf fuel heat content

TABLE 2-4
Auxiliary Boiler

Parameter	Specifications
Manufacturer/Refurbishing Company	Cleaver Brooks
Model	D-Type, Model NB-100D-40
Fuel Type	Natural Gas
Natural Gas Heating Value	1,030 MMBtu/scf
Heat Input (HHV)	36 MMBtu/hr
Fuel Consumption	0.035 MMscf/hr
Exhaust Flow	6,100 DSCFM
Exhaust Temperature	300°F

2.2.2 Equipment Layout

The proposed site layout is shown on Figure 1-2. This figure shows the new features integrated into the site features that will remain following the implementation of activities approved as part of the CEC Final Decision (00-AFC-14). The new equipment and processes to be installed include:

1x1 Fast Start Combined-cycle Unit

- GE 7FA.05 gas turbine generator
- Heat recovery steam generator
- Catalytic oxidation system for CO reduction
- Selective catalytic reduction system for NOx reduction
- Steam turbine generator
- Condenser
- Dry cooling tower

- Closed cooling water coolers
- Stack
- Auxiliary boiler
- Generator step-up transformer

Two Simple-cycle Units

- Two Rolls Royce Trent 60 gas turbine generators
- Two catalytic oxidation systems for CO reduction
- Two selective catalytic reduction systems for NOx reduction
- Two stacks
- Two generator step-up transformers

The overall layout of the new ESPFM units under this 2013 PTA will be located in the same general area of the facility as previously permitted ESEC. Figure 2-6 shows the equipment/processes to be removed with the shutdown and removal of Units 3 and 4 to make room for the new natural-gas-fired generating units. The following equipment and processes will be removed:

- Boilers and steam lines
- Steam turbine generators
- Condenser systems including condensate lines, air ejectors, condensate pumps, condensers
- Inlet and outlet circulating water lines for each unit
- Boiler feedwater system including lines, pumps and heaters
- Compressed air system including dryers
- Lube oil systems
- Fire water system
- Flue gas ducting
- Stacks
- Unit electrical systems
- Unit control systems
- Transformers and switchgear

2.2.3 Site Access

Entrance to the site is from Vista Del Mar Boulevard through a locked gate, which is monitored by a security officer and closed-circuit video surveillance camera 24 hours a day. Site access is shown in Figure 2-7.

2.2.4 Electric Transmission

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

2.2.5 Fuel Gas System

Natural gas will continue to enter the ESEC at the existing metering station location to support the ESPFM. Natural gas for the new Units 9, 11 and 12 and the auxiliary boiler will be metered separately and proceed through a new natural gas compression station. Natural gas from the metering station will enter the compression station at a pressure at about 350 psig, near ambient temperature. The natural gas will have entrained liquid and solid particles removed prior to being compressed to 450 psig for the GE CC Fast gas turbine generator and 850 psig for the Trent 60 gas turbine generators. The compressed natural gas will then be filtered and continue to the gas turbine fuel systems. The 7FA.05 includes a performance fuel gas heater; the Trent 60 units do not. The fuel gas heaters will heat the natural gas from approximately 245°F to approximately 365°F using high-pressure economizer bleed from the HRSG as the heating medium. For start-up, steam from the auxiliary boiler will be used as the gas fuel heating medium until economizer bleed has reached the necessary temperature. From the fuel gas heaters, the natural gas will proceed to the combustion fuel system inlet. Gas compressor discharge cooling of the natural gas, if required for start-up and recirculation, will be provided using ambient air fin fan coolers. A key advantage of this system is the use of existing ESEC natural gas supply pipelines. No modifications to the Southern California Gas (SoCalGas) system will be required to meet the ESPFM demand.

2.2.6 Capacity Factor

Operation of the CC Fast unit is forecasted to be up to 60 percent capacity factor annually, including up to 200 startups per year and 200 shutdowns per year. The Rolls Royce Trent 60 peaker units are forecasted to be up to 55 percent capacity factor annually, including 480 hours per year for startups and shutdowns per peaking unit.

An LGIA exists between ESEC LLC, SoCalGas, and the CAISO. The LGIA provides the platform from which electrical interconnection needs and issues are to be addressed and managed.

The LGIA for replacement of Units 3 and 4 with Units 9–12 is currently going through the CAISO Cluster 4 review process. It is expected that the LGIA will be modified to incorporate the modifications concurrent with CEC processing of this PTA. The project owner will provide updates, as necessary, regarding the status of modifying the agreement to accept the new power.

2.2.7 Efficiency and Reliability

Operation of the CC Fast unit and advanced Rolls Royce Trent 60 peaker units offers several advantages as compared to conventional technologies. This design solves the slow startup limitation associated with conventional combined-cycle facilities in intermediate-duty applications. During conventional combined-cycle startup, which can typically be 3 hours for a warm or hot start and 6 hours for a cold start, the gas turbine generator is operated well below its optimal performance point in terms of thermal and air emissions performance while the bottoming cycle warms up. In contrast, the CC Fast configuration can deliver 75 percent of gas turbine base load output within 10 minutes of unit startup (hot, warm, or cold HRSG/STG conditions) and 100 percent within 12 minutes, and can achieve full combined-cycle gas turbine output within 45 minutes for hot starts, 85 minutes for warm starts, and 125 minutes for cold starts. This faster startup time allows the gas turbine generators to achieve maximum efficiency more quickly and provides the following operational benefits:

- Reduced air emissions (gas turbine generators reach optimal emissions performance faster)
- Reduced start up fuel consumption
- Reduced steam loss associated with steam seal warming during start up
- Improved heat rate
- Minimal water consumption
- Flexible siting options

2.2.8 Benefits

The benefits of the ESPFM are significant and include the following advantages:

- Use of CC Fast technology, as compared to other similar technologies (e.g., Siemens Flex Plant 10), will result in lower installed costs per kilowatt, improved heat rate, minimal water consumption, and optimal flexible siting.
- Rapid starting capability supports wind and solar renewable generation by providing reliable localized generation that can quickly respond should wind or solar resources not be available during peak electrical demand periods.
- Significant improvement in the visual aesthetics associated with new components integrated into the facility will be realized.
- Facility will use existing transmission, natural gas facilities, power plant labor, and infrastructure.
- Facility will use state-of-the-art BACT pollution controls.

- Changes will provide much needed, highly efficient, additional power supply in the western SCE load center.
- Project owner is committed to improving access to the recreational bike path from the southern portion of the property.

2.3 Water Requirements and Demand

Water usage for the CC Fast and Rolls Royce Trent 60 peaker unit systems will be less than previously required for Units 3 and 4 because during startup venting associated with steam seal warming is reduced. Water usage in the 7FA.05 is comparable to other F-Class gas turbines equipped with inlet evaporative cooling. Water usage for the Trent 60 units is comparable to other intercooled aeroderivative gas turbines (e.g., GE LM 6000 SPRINT). The expected daily and annual water use and water quality for the ESPFM is listed in Tables 2-5 and 2-6, respectively. The water supply requirements also include domestic uses and miscellaneous plant uses. The conventional media-type evaporative cooling will be used to lower the temperature of the GE CC Fast inlet air. A Caldwell wet compression system will be used to reduce compressor work and lower the temperature of the Trent 60 units high-pressure compressor discharge air at ambient temperatures above approximately 45°F.

TABLE 2-5
Daily Water Supply Requirements[a]

Water Source	Average Usage[b]	Peak Usage[c]
City of El Segundo (Metropolitan Water District of Southern California)		
Potable Water	750 gal/day	750 gal/day
Plant and Equipment Drains	25,000 gal/day	25,000 gal/day
Makeup to Evaporative Cooler	44,000 gal/day	85,000 gal/day
Quench Water	23,000 gal/day	33,000 gal/day
Total City Water	93,000 gal/day	144,000 gal/day
West Basin Municipal Water District		
Makeup to HRSG Cycle	64,000 gal/day	100,000 gal/day
Combustion Turbine (CT) Steam Injection	0 gal/day	340,000 gal/day
Total Reclaim Water	64,000 gal/day	440,000 gal/day

[a]Based on Table 3.4-1 from 00-AFC-14.

[b]Daily average based on 59°F average annual ambient temperature, not firing the HRSGs, no steam injection to the CT, evaporative coolers on, assumed for 24-hour day.

[c]Daily average for peak load operation based on 83°F ambient temperature, the HRSGs fired, 12 hours of steam injection to the CT, evaporative coolers on, assumed for 24 hour day.

TABLE 2-6
Expected Water Supply Quality

Constituent	City of El Segundo	West Basin Municipal Water District	Seawater
Calcium	46	0.06	400
Magnesium	19	0.03	1,100
Sodium	59	4.8	11,000
Potassium	3	0.34	380
M-Alkalinity as $CaCO_3$	100	14	NR
Sulfate	129	ND	1,900
Chloride	60	2.7	19,000
Nitrate (as N)	0	0.13	0.59

TABLE 2-6
Expected Water Supply Quality

Constituent	City of El Segundo	West Basin Municipal Water District	Seawater
Fluoride	0.20	0.10	0.7
Aluminum	0.08	ND	0.1
Silica	NR	0.14	0.01–7.0
TDS	440	25	33,000
PH	8.2	7.4	7.7-8.3
TSS	NR	ND	3.0
BOD5	NR	NR	1.0
COD	NR	NR	49

ND = Not Detected; NR = Not Reported
Based upon Table 3.4-3 from 00-AFC-14
(mg/L as ions, except as noted)

Similar to the permitted ESEC project design water, water will be supplied from two sources: potable water from the cities of El Segundo and Manhattan Beach (Metropolitan Water District of Southern California) and California State Title 22 reclaim water from West Basin Municipal Water District (West Basin). The ESPFM will use water from the West Basin for potable use and fire emergencies. The Title 22 reclaim water, first-pass reverse osmosis (RO) product water received from the District will be used as the supply to the cycle makeup treatment system as well as makeup to the inlet cooling. Title 22 reclaim water, irrigation quality, will be blended with the single-pass RO product water for use in the gas turbine inlet cooling. The proposed plant design will utilize two air-to-air heat exchangers for thermal cycle heat rejection. Seawater will no longer be used for heat rejection.

The average and peak annual use from city potable and reclaim water supply comparisons from the previously permitted and proposed plant design are listed in Table 2-7. The average quality of city water, reclaim water, and seawater supplies is listed in Table 2-6. Water use of the three sources is shown on the water balance diagrams (Figures 2-8 and 2-9).

TABLE 2-7
Annual Water Use by Source

Water Source	Annual, Average (AFY)		Annual, Maximum (AFY)	
	Previously Permitted[a]	Proposed[b]	Previously Permitted[c]	Proposed[d]
Cities of El Segundo and Manhattan Beach (Metropolitan Water District of Southern California)	97	0.72	104	0.84
West Basin Municipal Water District′	112[e,f]	118	120[e,f]	137
Seawater	200,000 (U4 only)	0	399,000 (U3 and 4 intake structure 002)	0

[a]Annual average is estimated as the daily average x 365 days x 93 percent.

[b]Annual average is estimated as the daily average usage (Table 3.4-1) x 313 days.

[c]Annual maximum is estimated as the daily average x 365 days x 100 percent.

[d]Annual maximum is estimated as the daily average usage (Table 3.4-1) x 365 days.

[e]Annual average reclaim water demand is estimated as the peak daily use x 42 days + the average daily use x 23 days the quantity x 93 percent.

[f]Annual maximum reclaim water demand is estimated as the peak daily use x 42 days + the average daily use x 323 days the quantity x 100 percent.

Information based on Table 3.4.2 from 00-AFC-14

AFY = acre-feet per year

Reclaim single-pass RO product water will be treated onsite by portable cycle make-up treatment equipment, which will be regenerated offsite, to supply demineralized make-up water to the steam cycle, and the combustion turbines for steam injection power augmentation.

Reclaim single-pass RO water will be directed from West Basin via the new 10-inch line to a storage tank prior to the cycle makeup treatment system. This system will include a permanently installed forwarding pump and mobile demineralization equipment that will be regenerated offsite. Demineralized water produced by the cycle makeup treatment system will be stored in a demineralized water storage tank. The design and location of the new 10-inch water line will be consistent with the CEC Final Decision (00-AFC-14).

The water characteristics and average and peak daily use for each process utilizing city potable or reclaim water supply is listed in Table 2-8, which also compare existing conditions to proposed conditions. Table 2-9 provides existing and projected water use.

TABLE 2-8
Daily Water Supply Requirements

	Daily Average Usage		Daily Peak Usage	
Water Source	**Previously Permitted[a]**	**Proposed[b]**	**Previously Permitted[c]**	**Proposed[d]**
Cities of El Segundo and Manhattan Beach (Metropolitan Water District of Southern California)				
Potable Water – Sanitary[e]	50	750	750	750
Plant and Equipment Drains		0	25,000	0
Makeup to Evaporative Cooler		0	85,000	0
Quench	23,000	0	33,000	0
Total City Water (Potable)	92,750	750	143,750	750
West Basin Municipal Water District Title 22 Reclaim Water				
Single-Pass RO Quality Water				
Single-pass RO Makeup to HRSGs and Evaporative Coolers, and Misc. Steam Losses	64,000	15,360	440,000	529,920
Irrigation Quality				
Makeup to Evaporative Cooler[f]	0	19,200	0	48,000
Total Title 22 West Basin Water Demand (RO and Irrigation Quality)		34,000	440,000	577,920
Seawater				
Once-Through Cooling Water		0	200,000,000 (for U4)	0

[a]Daily average based on 59°F average annual ambient temperature, not firing the HRSGs, no steam injection to the CT, evaporative coolers on, assumed for 24-hour day.

[b]Daily average usage is based on 83°F DBT, 47% RH, HRSGs in use; power augmentation, water injection to CTs, and evaporative coolers on, 16-hour/day operation.

[c]Daily average for peak load operation based on 83°F ambient temperature, the HRSGs fired, 12 hours of steam injection to the CT, evaporative coolers on, assumed for 24 hour day.

[d]Daily peak usage is based on 83°F DBT, 47% RH, HRSGs in use; power augmentation, injection to CTs, and evaporative coolers on, 16 hour/day operation.

[e]Daily potable water consumption is based on 24 hours @ 0.52 gpm.

[f]Make up to evaporative coolers is mixed Reclaimed Single Pass RO water and Irrigation Quality water.

Units = gallons per day

TABLE 2-9
Existing and Projected Water Use

	Existing			Proposed			
						Average (gpd)	
Units	**Cooling (mgd-max)**	**Reclaimed (no R.O.) (gpd-avg)**	**Potable* (gpd-avg)**	**Cooling (mgd-max)**	**Reclaimed (no R.O.) (gpd-avg)**	**Reclaimed (R.O.)**	**Potable**
1 & 2 (abandoned)	0	0	0	—	—	—	—
3 & 4 (U3 retired for ESEC and U4 retired for ESPFM)	200	Minimal	129,998	0	0	0	0
5 -8	—	—	—	—	—	64,000	93,000
6 & 8 (need to make sure this is ESEC values from 2007 PTA)	—	—	—	0	Minimal		
Total	**605**	**85,936**	**179,938**	**605**	**85,936**	**64,000**	**222,998**

*Volumes estimated based on relative capacity utilization of 13.1% for Units 1&2 and 34.1% for Units 3&4 applied to total average volume utilized.

Information based on Table 5.5-1 from 00-AFC-14

The existing 6-inch line at the site carrying the Title 22 irrigation water will be used for supplying both the approved ESEC and proposed ESPFM requirements for irrigation water. No proposed changes are needed for the planned reclaim or potable water line interconnections as referenced in the CEC Final Decision (00-AFC-14).

2.4 Waste Management

Waste management volumes and disposal sites are consistent with the information included in the 00-AFC-14 Final Decision. The decommissioning, demolishing, and replacing the existing Units 3 and 4 steam boiler plants with new natural-gas-fired electrical generating capacity will result in the generation of nonhazardous and small quantities of hazardous wastes. A summary of the construction waste streams and management is presented in Tables 2-10 through 2-12. For the purpose of this discussion, construction includes site preparation, demolition, and new facility construction.

TABLE 2-10
Estimated Quantities of Asbestos-containing Materials

Component/Item/Area	Level	ACM (Y/N)	Type	Est. Quantity	Additional Samples
Steam Generator and Auxiliary Equipment (above turbine deck)					
Boiler, Piping & Ducting	7	No	Blue bands (abated)	N/A	3-9
Stack	7 up	Yes	Painted Coating (peeling w/lead)	14’x 110’= **1,540 SF**	3
Air Ejectors	3	Yes	Cal/mag and mud	50 LF 6”-12” diam.	-
De-aerator, recirc. tank, storage tank, flash tank	3	No	N/A	N/A	-
Burning cleaning station	3	Yes	Transite panels/putty	**900 SF**	-
Elevator shaft	G-7	Yes	Transite panels/putty	**54’x 140’ = 7,560 SF**	-
Chart recorder shack	6	Yes	Transite panels/putty	**633 SF**	-

TABLE 2-10
Estimated Quantities of Asbestos-containing Materials

Component/Item/Area	Level	ACM (Y/N)	Type	Est. Quantity	Additional Samples
Penthouse	7	Unknown/assume	Blocks and spray-applied	**36'x 36' x 20' inaccessible space**	6
Air pre-heaters	3	No	N/A	N/A	—
Control room (1st, 2nd & roof)	3–5	Yes/assume	SCT(2), ACT/M(2), floors(4), tar/gravel, PM	25'x 60' CMU building w/2 floors **SCT/ACT–3,000 SF** **Floors–3,000 SF** **Roof-1,500 SF**	48
Steam Generator and Auxiliary Equipment (below turbine deck)					
Boiler - lower dead air space (internal)	2	Yes	Block (deteriorated)	**Unknown 2(5'x 60'x 15' inaccessible space)**	—
Gas recirc. fan & ducts	G	Yes-confirm	Mud & wire	2 each (30'x 30' x 40')=**7,200 SF**	3
Blowdown tank	G	No	N/A	N/A	—
Draft System					
Forced draft fans	G	No	N/A	N/A	—
Induced draft fans (N&S)	G-2	Yes	Mud & cloth (wire?)	2 each (20'x 30'x 30')=**3,600 SF**	—
Induced draft ducts (N&S)	G-2	Yes	Mud & cloth (wire?)	2 each (30'x 15'x 30')=**9,000 SF**	—
Air pre-heaters (N&S)	2	Yes	Mud & cloth (wire?)	2 each (25'x 15'x10')=**3,750 SF**	—
Fuel System					
Fuel gas piping, oil piping, oil heaters, oil pumps	G	No	Blue bands (abated)	N/A	—
Reboiler	G	No	Bare metal	N/A	—
Condensate and Feedwater System					
1st point feedwater heaters (E&W)	2	Yes	Mud & wire	2(30'x 15.7') + 2(19.62')=**981.24 SF**	—
2nd point feedwater heaters (E&W)	2	Yes	Mud & wire	2(30'x 15.7') + 2(19.62')=**981.24 SF**	—
3rd point feedwater heater	2	Unknown/assume	Mud & wire	(25'x 15.7') + (19.62')=**412.12 SF**	3
4th point feedwater heater	2	Unknown/assume	Mud & wire	(25'x 15.7') + (19.62')=**412.12 SF**	3
Evaporator condenser (1 per unit)	2	Yes	Mud & wire	(20'x 12.56') + (12.56')=**263.76 SF**	—
Boiler feed pumps (inside barrel housing)	G	Unknown/assume	Unknown	5 @ 80 SF each=**400 SF**	3
Condensate booster pumps	G	No insulation	N/A	N/A	—

TABLE 2-10
Estimated Quantities of Asbestos-containing Materials

Component/Item/Area	Level	ACM (Y/N)	Type	Est. Quantity	Additional Samples
Turbine (above and below the deck)					
Turbine housing	3	Unknown (not likely)	Sound deadener (hard spray-on)	Unknown	5
Other areas	2-3	Not likely-confirm	Blankets	N/A	3
Chemical Lab and Locker Room					
Counter tops	G	Unknown/assume	Possible Resin	**40 SF**	3
Ceiling tiles	G	Unknown/assume	1’x 1’/M, 2’x 4’	**400 SF**	6
Flooring	G	Unknown/assume	9”x 9”/M, 12”x 12”/M	**400 SF**	12
Exterior					
Wall plaster	G	Unknown/assume	3 coat on lath	**5,000 SF**	5
Exterior wall vents- north and west	G	Yes	Transite panels	**1,770 SF**	—
Maintenance Shop and Warehouse					
Miscellaneous	G	Unknown	1’x 1’ ACT/M (2), 2’x 4’ SCT, WB/JC, HP, roofing, pen. mastic	**ESTIMATED SCT/ACT-4,000 SF WB/JC-5,000SF HP-5,000 SF Roof-10,000 SF**	27
Fuel Oil Tank Area					
Tank siding	35’–40’	Yes	Transit panels	1 @ 16,000	—
Displacement oil heater	G	Unknown/not likely	Insulation	Unknown	6
Displacement oil tank	G	No	Bare metal	N/A	—

Note: Information based on Table 5.14-2 from 00-AFC-14
Based on quantities encountered as part of demolition of Units 1 and 2

TABLE 2-11
Asbestos-containing Materials

Component/Item/Area	Level	ACM (Y/N)	Type	Est. Quantity	Samples
Steam Generator and Auxiliary Equipment (above turbine deck)					
Boiler, Piping & Ducting	7	No	Blue bands (abated)	N/A	3–9
Stack	7 up	Yes	Painted Coating (peeling w/lead)	14’x 110’=**1,540 SF**	3
Air Ejectors	3	Yes	Cal/mag and mud	**50 LF 6”-12” diam.**	—
De-aerator, recirc. tank, storage tank, flash tank	3	No	N/A	N/A	—
Burning cleaning station	3	Yes	Transite panels/putty	**900 SF**	—
Chart recorder shack	6	Yes	Transite panels/putty	**633 SF**	—

TABLE 2-11
Asbestos-containing Materials

Component/Item/Area	Level	ACM (Y/N)	Type	Est. Quantity	Samples
Penthouse	7	Unknown/assume	Blocks and spray-applied	Unknown (36'x 36' x 20' inaccessible space)	6
Air pre-heaters	3	No	N/A	N/A	—
Steam Generator and Auxiliary Equipment (below turbine deck)					
Boiler - lower dead air space (internal)	2	Yes	Block (deteriorated)	Unknown (25'x 60'x15' inaccessible space)	—
Gas recirc. fan & ducts	G	Yes-confirm	Mud & wire	2 each (30'x 30' x 40')=**7,200 SF**	3
Blowdown tank	G	No	N/A	N/A	—
Draft System					
Forced draft fans	G	No	N/A	N/A	—
Induced draft fans (N&S)	G-2	Yes	Mud & cloth (wire?)	2 each (20'x 30'x 30')=**3,600 SF**	—
Induced draft ducts (N&S)	G-2	Yes	Mud & cloth (wire?)	2 each (30'x 15'x 30')=**9,000 SF**	—
Air pre-heaters (N&S)	2	Yes	Mud & cloth (wire?)	2 each (25'x 15'x10')=**3,750 SF**	—
Fuel System					
Fuel gas piping, oil piping, oil heaters, oil pumps	G	No	Blue bands (abated)	N/A	—
Reboiler	G	No	Bare metal	N/A	—
Condensate and Feedwater System					
1st point feedwater heaters (E&W)	2	Yes	Mud & wire	2(30'x 15.7') + 2(19.62')=**981.24 SF**	—
2nd point feedwater heaters (E&W)	2	Yes	Mud & wire	2(30'x 15.7') + 2(19.62')=**981.24 SF**	—
3rd point feedwater heater	2	Unknown/assume	Mud & wire	(25'x 15.7') + (19.62')=**412.12 SF**	3
4th point feedwater heater	2	Unknown/assume	Mud & wire	(25'x 15.7') + (19.62')=**412.12 SF**	3
Evaporator condenser (1 per unit)	2	Yes	Mud & wire	(20'x 12.56') + (12.56')=**263.76 SF**	—
Boiler feed pumps (inside barrel housing)	G	Unknown/assume	Unknown	5 @ 80 SF each=**400 SF**	3
Condensate booster pumps	G	No insulation	N/A	N/A	—
Turbine (above and below the deck)					
Turbine housing	3	Unknown (not likely)	Sound deadener (hard spray-on)	Unknown	5
Other areas	2-3	Not likely-confirm	Blankets	N/A	3

TABLE 2-11
Asbestos-containing Materials

Component/Item/Area	Level	ACM (Y/N)	Type	Est. Quantity	Samples
Exterior					
Auxiliary piping from Unit 2 to 3 under crossover bridge	G	Yes	Pipe insulation	May not be impacted; no quantity at this time	—

Information based on Table 5.14-3 from 00-AFC-14)

Nonhazardous solid wastes during construction include debris and other materials requiring removal during site grading and excavation, excess concrete, lumber, scrap metal, empty nonhazardous chemical containers, and office materials. All nonhazardous wastes will be recycled to the greatest extent practical and the remainder removed on a regular basis by a certified waste handling contractor. These materials are listed in Table 2-12.

TABLE 2-12
Summary of Construction Waste Streams and Management Methods[a]

Waste Stream	Waste Classification	Amount	Treatment
Scrap wood, steel, glass, plastic, paper, calcium, silicate insulation, mineral wood insulation, asphalt, concrete	Nonhazardous	20-40 cu yd/wk	Waste disposal facility
Empty hazardous material containers – drums	Recyclable Hazardous	1 cu yd/wk	Recondition or recycle
Used and waste lube oil during CT and ST lube oil flushes	Recyclable Hazardous	<55 gallons per flush period, approximately 3 week duration	Recycle
Oil absorbent mats from CT and ST lube oil flushes and normal construction	Nonhazardous	1,000 sq. ft. per month, as needed	Waste disposal facility or laundry (permitted to wash rags)
Oily rags generated during normal construction activities lube oil flushes	Nonhazardous	3-4 55 gallon drums a month	Waste disposal facility or laundry (permitted to wash rags)
Spent batteries; lead acid	Hazardous	2 batteries/year	Recycle
Spent batteries; alkaline type, Sizes AAA, AA, C and D	Hazardous Recyclable	60 batteries/month	Recycle
HRSG and Preboiler piping cleaning waste	Hazardous	200,000 gal per cleaning	Hazardous waste disposal facility or recycle
Used oil from oil/water separator	Recyclable Hazardous[b]	<1,000 gal per year	Recycle
Sanitary Waste-Portable Chemical Toilets and Construction Office Holding Tanks	Sanitary	600 gpd	Pumped by licensed contractors and transported to sanitary water treatment plant
Construction waste water from dewatering operations	Nonhazardous	65 million gallons	Carbon absorption and discharge under NPDES permit
Granular Activated Carbon	Nonhazardous Recyclable	Exchange 40,000 pounds of carbon per week (4 vessels)	Regenerated by the carbon supplier at their waste disposal facility
Soil	Nonhazardous Recyclable Hazardous (TBD)	20,000 cubic yards	Soil recycling facility or class I or III facility

[a]All numbers are estimates.
[b]Under California regulations
(Information based on Table 5.14-4 from 00-AFC-14)

Operation of the facility will also generate wastes resulting from processes, routine facility maintenance, and office activities. The operating waste streams and management methods are summarized in Table 2-13. All nonhazardous wastes during operation of the facility will be recycled to the greatest extent practical and the remainder removed on a regular basis by a certified waste handling contractor.

TABLE 2-13
Operating Waste Streams and Management Methods[a]

Waste Stream	Waste Classification	Amount	Treatment
Used hydraulic fluids, oils, grease, oily filters	Recyclable Hazardous	< 5 gallons/day	Recycle
Spent batteries; lead acid	Recyclable Hazardous	2 batteries/year	Recycle
SCR catalyst	Recyclable Hazardous	50 cubic meters every 3 to 5 years	Recycle
Oxidation Catalyst (CO)	Recyclable Hazardous	50 cubic meters every 3 to 5 years	Recycle
Used oil from oil/water separator	Recyclable Hazardous[b]	50 gallons/year	Recycle
Oily rags	Nonhazardous	55 gallons/2months	Laundry (permitted to wash oil rags)
CTG used air filters	Nonhazardous	<1,000 filters	Recycle
CTG water wash	Nonhazardous	7,200 gallons/year	Waste disposal facility
HRSG periodic operational chemical cleaning	Hazardous	50,000 gallons per HRSG cleaning (Approx. 2 cleanings every 5 years)	Hazardous waste disposal facility (by licensed subcontractors)

[a]All numbers are estimates.
[b]Under California regulations.
Information based on Table 5.14-5 from 00-AFC-14)

2.4.1 Management and Disposal of Hazardous Materials and Hazardous Wastes

Consistent with the current operations at the ESEC, the ESPFM will also use the same aqueous ammonia line to deliver ammonia to the site. A variety of chemicals will be stored and used during construction and operation of the facility. A list of chemicals anticipated to be used is provided in Table 2-14. The storage, handling, and use of these chemicals will be conducted in accordance with all applicable LORS.

TABLE 2-14
Hazardous Materials and Wastes Usage and Storage during Construction and Operations*

Material	Purpose and Location	Usage/Day	Maximum Stored	Storage Type
A300- low hazard corrosion inhibitor	South of Unit 4 boiler	75 gal.	100 gal.	Steel drum, tote bin
Acetylene (C2H2) 99.80%	Southwest of warehouse	3,530 cu ft	10,950 cu ft	Cylinder
Ammonium Bicarbonate	South of Unit 4 boiler	400 lb.	600 lb.	Bag
Ammonium bifluoride NH4HF2	Chemical cleaning of HRSG	As needed	Temporary only	Portable vessel
Aqua ammonia (29.4%)	South of Unit 4 boiler	600 gal.	1,000 gal.	Steel drum, tote bin
Aqueous ammonia (29%) NH4(OH)	NOx emissions control. Top of hill and other locations	15,000 gal.	20,000 gal.	Underground tank

TABLE 2-14
Hazardous Materials and Wastes Usage and Storage during Construction and Operations*

Material	Purpose and Location	Usage/Day	Maximum Stored	Storage Type
Argon	Warehouse, south side and other locations	850 cu ft	1,410 cu ft	Cylinder
Asbestos Containing Debris	Hazardous waste storage area and accumulation areas	2,000 lb.	15,000 lb.	Steel drum
Bleach	North of Units 3, 4; southwest of Units 5 and 7	1,500 gal.	2,600 gal.	Aboveground tank
Calgon C-9 Corrosion Inhibitor	Chemical storage room, chemical feed areas	250 lb.	600 lb.	Plastic/Nonmetallic Drum
Calgon H-510 Microbiocide	Chemical storage room, chemical feed areas	250 lb.	600 lb.	Plastic/Nonmetallic Drum
Cardox –carbon dioxide	Unit 7 2nd level west side	3 tons	5 tons	Tank inside building
ChelClean 665 Chelating Agent	South of Unit 4 boiler	50,000 lb.	89,000 lb.	Poly tank
Citric acid	Chemical cleaning of HRSG, feedwater systems	As needed	Temporary only	Portable vessel
CuSol Solvent Waste	South of Unit 4	100,000 gal.	180,000 gal.	Tank wagon
Dielectric Solvent	Unit 7 Aux. bay southwest corner; Unit 4 Aux. bay south end.	110 gal.	330 gal.	Steel drum
Diesel fuel	Warehouse, southwest side	110 gal.	165 gal.	Steel drum
Di-, tri-sodium phosphate solution	Boiler water pH/scale control	5 lb.	800 gal	Portable vessel
EDTA chelant	Chemical cleaning of HRSG, feedwater systems	As needed	Temporary only	Portable vessel
Elimin-ox - Oxygen scavenger	Feedwater oxygen control. Under Unit 3 boiler and Unit 5 chemical area	500 gal.	800 gal.	Tote bin
EPA Protocol Mix (1.0% O2)	Warehouse, southwest side	282 cu ft	564 cu ft	Cylinder
EPA Protocol Mix (Nitric Oxide/Nitrogen[12.75ppm])	Warehouse, southwest side	564 cu ft	1,410 cu ft	Cylinder
EPA Protocol Mix (17% O_2)	Warehouse, southwest side	564 cu ft	1,410 cu ft	Cylinder
Flammable Gas Mixture#1	Warehouse, south side	846 cu ft	1,410 cu ft	Cylinder
Flammable Gas Mixture#2	Warehouse, southwest side	846 cu ft	1,410 cu ft	Cylinder
Flammable Gas Mixture#3	Warehouse, south side	846 cu ft	1,410 cu ft	Cylinder
Flammable Gas Mixture#4	Warehouse, southwest side	846 cu ft	1,410 cu ft	Cylinder
Flammable Gas Mixture#5 (72% Methane)	Warehouse, south side	846 cu ft	1,410 cu ft	Cylinder
Helium	Warehouse southwest side	282 cu ft	846 cu ft	Cylinder
Hydrazine (N2H4) 35%	Unit 3 Turbine Deck, Unit 5 Heater Deck	500 gallons	850 gallons	Tote bin
Hydrochloric acid HCl	Chemical cleaning of HRSG	As needed	Temporary only	Portable vessel
Hydrogen	Unit 3 northwest side, ground level	30,000 cu ft	40,000 cu ft	Cylinder
Hydrogen	Generator cooling.	8,000 cu ft	70,000 cu ft	Tank, carbon steel
Lubricating Oil	Unit 5 ground floor; southwest Unit 7, Unit 3 & 4 ground floor.	27,800 gal	40,500 gal	Aboveground tank, steel drum.

TABLE 2-14
Hazardous Materials and Wastes Usage and Storage during Construction and Operations*

Material	Purpose and Location	Usage/Day	Maximum Stored	Storage Type
Mineral Spirits	Paint shack	20 gallons	50 gallons	Can
Mineral Oil	Transformers at Units 1, 2, 3, and 4	87,800 gal	88,000 gal	Transformers
Nalco 350-corrosion inhibitor	Under Unit 3 boiler and Unit 5 chemical area	500 gal.	800 gal.	Tote bin
Nalco 356-corrosion inhibitor	Under Unit 3 boiler and Unit 5 chemical area	500 gal.	800 gal.	Tote bin
Nalco BT 3000	Boiler water treatment. Under Unit 3 boiler and Unit 5 chemical area	500 gal.	800 gal.	Tote bin
Nalco EG 5010	Boiler alkalinity control. Under Unit 3 boiler and Unit 5 chemical area.	500 gal.	800 gal.	Tote bin
Neutralizing amine solution	Feedwater pH control	5 lb.	800 gal	Portable vessel
Nitrogen	Unit 3 north side	106,000 cu ft	141,265 cu ft	Aboveground tank, cylinder
Non-RCRA Hazardous Waste Silicone Grease and Debris	Hazardous waste storage area and accumulation area	55 lb.	110 lb.	Steel drum
Oil Contaminated Soil/Solids	Hazardous waste storage area and accumulation area	220 lb.	1,100 lb.	Steel drum
Oxides of Nitrogen Mix (Nitric Acid 34 PPM)	Warehouse, southwest side	564 cu ft	1,410 cu ft	Cylinder
Oxides of Nitrogen Mix(Nitric Oxide 59.50 PPM)	Warehouse, southwest side	564 cu ft	1,128 cu ft	Cylinder
Oxides of Nitrogen Mix(Nitric Oxide 125 PPM)	Warehouse, southwest side	846 cu ft	1,410 cu ft	Cylinder
Oxidizer	South of Unit 4 boiler	30,000 cu ft	45,000 cu ft	Cylinder trailer
Oxygen scavenger solution	Feedwater oxygen control	2.5 lb.	800 gal.	Portable vessel
Oxygen Mix (8.5% O2)	Warehouse, southwest side	564 cu ft	1,410 cu ft	Cylinder
Oxygen – gaseous oxygen	Warehouse, south side	1,128 cu ft	3,666 cu ft	Cylinder
Paint	Paint shack	25 gallons	100 gallons	Can
Propane	Warehouse, southwest side	200 gal.	400 gal.	Cylinder
Selig Formula 229 Degreaser	Unit 7 Aux. bay southwest corner; Unit 4 Aux. bay south end.	110 gal.	110 gal.	Steel drum
Sodium Hypochlorite 12.5% wt NaOCl	Southwest of Units 5&7, North of Units 3&4	1500 gal.	2,600 gal.	Aboveground storage tank
Sodium nitrite NaNO2	Chemical cleaning of HRSG	As needed	Temporary only	Portable vessel
Sulfuric acid for station Batteries	Electrical/ctrl bldg. Combustion turbine/miscellaneous	As needed	600 gal 732 gal 100 gal	Battery Battery Battery
Waste Hydrazine and Debris	Hazardous waste storage area and accumulation area	55 lb.	110 lb.	Steel drum
Waste Lubricating Oil	Hazardous waste storage area and accumulation area	220 lb.	550 lb.	Steel drum

TABLE 2-14
Hazardous Materials and Wastes Usage and Storage during Construction and Operations*

Material	Purpose and Location	Usage/Day	Maximum Stored	Storage Type
Waste Mineral Oil for Transformers	Hazardous waste storage area and accumulation area	110 lb.	330 lb.	Steel drum
Waste Oil & Solvent	Hazardous waste storage area and accumulation area	450 lb.	1350 lb.	Steel drum
Waste Paint & Thinner	Hazardous waste storage area and accumulation area	55 lb.	110 lb.	Steel drum
Waste Paint Chips and Debris (with Benzene & Lead)	Near Paint shack and hazardous waste storage area	110 gal.	165 gal.	Steel drum
Waste Paint Solids/Sludge	Hazardous waste storage area and accumulation area	55 gal.	165 gal.	Steel drum
Waste Solvent and Debris	Hazardous waste storage area and accumulation area	55 lb.	110 lb.	Steel drum

*Reference: NRG, 2000 Business Plan Update, November.

Information based on Table 5.15-2 from 00-AFC-14)

2.4.2 Hazardous Materials Handling

Hazardous materials handling volumes and disposal sites are consistent with the information included in the CEC Final Decision (00-AFC-14) and are listed in Table 2-14.

2.4.3 Hazardous Wastes

Water removed from excavations during site preparation and construction will be processed through carbon filters. Used carbon filters constitute hazardous waste and will be sent to the manufacturer for processing and/or recycling as appropriate. Small quantities of hazardous wastes will possibly be generated over the course of construction. These may include waste paint, spent construction solvents, and spent welding materials. All hazardous wastes generated during facility construction and operation will be handled and disposed of in accordance with applicable LORS. Hazardous wastes will be either recycled or disposed of in a licensed Class I disposal facility, as appropriate. Managed and disposed of properly, these wastes will not cause significant environmental or health and safety impacts. Some hazardous wastes are generated, including spent catalyst from the SCR and CO systems, used oils from equipment maintenance, and oil-contaminated materials such as spent oil filters, rags, or other cleanup materials. Spent catalyst (approximately 50 cubic meters) is returned to the manufacturer on the order of every 3 to 8 years for metals reclamation and/or disposal. Used oil generated will be recycled, and oil or heavy metal contaminated materials (e.g., filters) requiring disposal will be disposed of in a Class I waste disposal facility.

2.4.4 Wastewater

Process wastewaters from the CC Fast system will consist of HRSG and inlet evaporative cooler blowdowns. In addition, wastewater will be generated during off-line water washing of the 7FA.05 and Trent 60 compressors. HRSG and evaporative cooler blowdown streams will be recycled back to the single-pass RO water storage tank, partly for reprocessing by the mobile demineralizers and partly for reuse as make-up to the inlet coolers. Off-line water wash effluent will be impounded and disposed of at an appropriately licensed offsite facility. Waste streams will be sampled in accordance with the existing monitoring and reporting program to ensure that the chemistry of the process waste is within the limits of the discharge permits. While process wastewater from the CC Fast and Rolls Royce Trent 60 peaker unit system will be recycled when possible, wastewater will be disposed of offsite as necessary if the water cannot be recycled and processed in a manner to meet the CC Fast and Rolls Royce Trent 60 peaker unit system water quality objectives. No process wastewater will be discharged from the facility via the existing retention basin or either outfall structure. The dissolved and suspended solids captured in the demineralizer beds will be removed via regeneration process offsite. Plant drains that conveyed plant wastes from Units 3 and 4 to the retention basin will be removed. Table 2-15 lists the process water characteristics.

TABLE 2-15
Expected Process Waste Characterization*

Constituent	Circulating Water Discharge	Existing Retention Basin Effluent	Combined Waste to Outfall 002	Sanitary Waste to Sewer
Calcium	400	43	400	50
Magnesium	1,100	18	1,100	20
Sodium	11,000	57	11,000	60
Potassium	380	3	380	3
M-Alkalinity, as CaCO3	NR	97	NR	100
Sulfate	1,900	123	1,900	130
Chloride	19,000	58	19,000	60
Nitrate	0.59	0	0.59	0
Fluoride	0.7	0.18	0.7	0.20
Aluminum	0.1	0.06	0.1	0.08
Silica	0.01-7.0	1	0.01-7.0	NR
TDS	33,000	420	33,000	440
pH	7.7-8.3	8.1	7.7-8.3	8.2
TSS	3.0	<1	3.0	500
Phosphate	NR	4	0	NR
Ammonia	NR	0	0	5
Oil and grease	NR	0	0	NR
BOD5	1.0	ND	1.0	400
COD	49	ND	49	100

*All numbers are approximate
NR = Not Reported
Information based on Table 5.5-22 from 00-AFC-14
mg/L as ions, except as noted

Sanitary wastewater, including eyewash station water and shower water, will be directed to the City of Manhattan Beach Municipal Sanitary Sewer in accordance with the City Public Works Department's discharge requirements and in accordance with existing COCs from the amended 00-AFC-14 Final Decision. Estimated volumes of the facility's liquid wastewater discharge remains unchanged and are shown in Table 2-16. The ESPFM is proposed as a zero-liquid-discharge facility where only stormwater and sanitary effluent will leave the site.

TABLE 2-16
Estimated Liquid Process Wastewater Volumes to Discharge

Waste Stream	Source	Quantity/Day[a]	
		Previously Permitted[b]	Proposed
Circulating Water Return (U4 only)	Condenser	200,000,000	0
Stormwater Oil Water Separators Effluent	Plant and equipment drains, area precipitation runoff	3,100	3,100
Existing Retention Basin	Effluent HRSG, oil water separator effluent	80,000	0
Total Effluent to Outfall 002	Circulating water and oil water separator effluent	201,000,000	0
Total Sanitary Effluent to City Sewer[b]	Sanitary drains system	750 [c]	750 [c]

[a] All numbers are approximate based on peak discharge conditions.
[b] Assumes 6 gallons per minute, 24 hour day.
[c] Assumes an average daily flow of 0.52 gpm total from all sanitary waste streams.

Units = Gallons per day

2.5 Site Drainage

Stormwater generated during construction will be discharged under an existing Construction Stormwater National Pollutant Discharge Elimination System discharge permit obtained in compliance with existing COCs. Future site stormwater in the area of Units 5–8, following their construction, will be collected in yard drains that will route stormwater to an oil/water separator prior to discharge at Outfall 002.

2.6 Air Emission Characteristics

The CC Fast and Rolls Royce Trent 60 peaker units incorporate dry low NOx combustion systems. In this combustion system, NOx control is achieved without use of water or steam injection. As described above, the CC Fast and Rolls Royce Trent 60 peaker unit fast-start capability allows the gas turbine generators to reach their optimum air emissions performance operating levels faster, which significantly reduces startup emissions.

As discussed previously, the proposed ESPFM includes the installation of one GE fast-start combined cycle gas turbine and two advanced Trent 60 simple cycle turbines. Each unit will be equipped with an inlet air filter and an inlet air-cooling system. Tables 2-2, 2-3, and 2-4 list the technical specifications for new generation. The HRSG for the CC Fast combined-cycle gas unit, and the exhaust ducts for the two Trent 60 simple-cycle gas turbines, will be equipped with air emissions controls equipment including SCR system for NOx control and an oxidation catalyst for CO control. A continuous emission monitoring CEM) system (CEM) will also be included.

A more detailed review of the emission levels for the amended project is included in Section 3.1, Air Quality.

2.6.1 Emissions Control and Monitoring Equipment

This section describes the emissions controls and CEMS equipment. The combustion and post-combustion emission control technologies presented below will optimize emissions reductions consistent with normal operational practices. The ESPFM will use dry low-NOx combustion combined with catalyst technology to control NOx and CO emissions. Combustion design with clean fuels will be used to minimize emissions of other pollutants. Table 2-17 identifies the anticipated chemical usage required to operate the various environmental control systems.

TABLE 2-17
Anticipated Chemical Usage and Storage*

Material	Purpose	Usage/Day	Maximum Amount Stored	Storage Type
Neutralizing amine solution	Feedwater pH control	5 lb	800 gal	Portable vessel
Oxygen scavenger solution	Feedwater oxygen control	2.5 lb	800 gal	Portable vessel
Di-, tri-sodium phosphate solution	Boiler water pH/scale control	5 lb	800 gal	Portable vessel
Aqueous ammonia (approximately 29%) $NH_4(OH)$	NOx emissions control	1,500 gal	20,000 gal	Existing tank
Hydrochloric acid HCl	Chemical cleaning of HRSG	As needed	Temporary only	Portable vessel
Ammonium bifluoride NH4HF2	Chemical cleaning of HRSG	As needed	Temporary only	Portable vessel
Citric acid	Chemical cleaning of HRSG, feedwater systems	As needed	Temporary only	Portable vessel
EDTA chelant	Chemical cleaning of HRSG, feedwater systems	As needed	Temporary only	Portable vessel
Sodium hypochlorite	Biofouling Control in	13 gal	360 gal	Portable vessel
NaOCl (12.5%)	Circulating Water			
Sodium nitrite NaNO2	Chemical cleaning of HRSG	As needed	Temporary only	Portable vessel
Sulfuric acid for station	Electrical/ctrl building	0	600 gal	Battery
Sulfur hexafluoride	Circuit Breakers	As needed.		Compressed gas cylinder
Batteries	Combustion turbine Miscellaneous	0 0	732 gal 100 gal	Battery Battery
Hydrogen	Generator cooling	800 cu ft	70,000 cu ft	Tank, C.S.

*All numbers are approximate.
Information based on Table 3.4-8 from 00-AFC-14

2.6.2 NO_x Emissions

Dry low-NO_x combustor systems will be provided to control the NOx concentration in the CTGs' exhaust gas. This combustion emission control technology reduces peak flame temperature for natural-gas-fired units by staging combustors and premixing fuel with air prior to combustion in the primary zone. A selective catalytic reduction system (SCR) in the HRSG for the combined cycle unit, and in the exhaust ducts for the two Trent 60 simple cycle gas turbines, will provide further reduction of NOx. This is an add-on control technology in which ammonia will be injected into the exhaust gas stream in the presence of a catalyst bed to combine with NO_x in a reduction reaction forming nitrogen and water. For this reaction to proceed satisfactorily, the exhaust gas temperature must be maintained between 450°F and 850°F. The SCR equipment will include a reactor chamber, catalyst modules, ammonia storage system, ammonia vaporization and injection system, and monitoring equipment and sensors. The reactor chamber would be located in an appropriate zone of the HRSG where the catalyst will be the most effective at all loads. The ammonia injection is located upstream of the catalyst. SCR is a commercially available, demonstrated control technology currently employed on several combined cycle combustion turbine projects capable of very low NO_x emissions (< 2.5 ppmvd).

2.6.3 CO Emissions

Combustor designs lower CO emissions concurrently with NO_x emissions. To further reduce CO emissions, an oxidation catalyst will be used. An oxidation catalyst consists of a noble metal catalyst section incorporated into the combustion turbine exhaust. The catalyst promotes oxidation of CO to carbon dioxide (CO_2) at much lower temperatures (650°F to 1150°F) than possible for oxidation without the catalyst. The control efficiency is primarily a function of gas residence time and can exceed 90 percent.

2.6.4 VOC Emissions

Volatile organic compounds (VOCs) include all unburned hydrocarbons except methane. VOC emissions are low due to proper combustion controls in the combustion turbine. No other controls are required for VOC control.

2.6.5 Particulates

Particulate emissions are minimized through the use of natural gas. In addition, inlet air filtration is used to minimize airborne particulate ingestion into the combustion turbine. Particulate emission from combustion of natural gas is minimal as compared to other types of fossil fuels.

2.6.6 Emission Monitoring

The project will install a continuous CEM system, which will sample, analyze, and record the concentration of CO, NOx, and oxygen/carbon dioxide in the flue gas. The system generates a log of emissions data and provides alarm signals to the control room when the level of emissions exceeds pre-selected limits. Continuous compliance with the NOx and CO emission limits will be demonstrated with the CEM system based on the applicable averaging time designated.

2.7 Fire Protection

The fire protection systems limit personnel injury, loss of life, property loss, and plant downtime due to fire. The existing firewater system has been upgraded significantly as part of the ESEC project; the location of the existing fire/service water storage tank and associated electric motor-driven firewater pump will not change. The firewater supply and pumping system will provide the code required quantity of fire-fighting water to yard hydrants, hose stations, and water spray and sprinkler systems. Two sources of firewater will be provided. The primary source will be the existing fire/service water storage tank and the secondary source will be the water main line from the City of Manhattan Beach. The fire/service water storage tank has capacity reserved for firewater use only, in accordance with NFPA 13. A 100 percent capacity, electric motor-driven pump takes suction from the fire/service water storage tank. A 100 percent capacity diesel engine-driven pump will take suction from the city water line and will operate as the backup pump to the electric motor-driven pump. Both pumps are capable of supplying maximum water demand for any automatic sprinkler system plus water for fire hydrants and hose stations.

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

The firewater system will have sectionalizing valves so that a failure in any part of the system can be isolated while allowing the remainder of the system to function properly. Fire hydrants with hose houses will be spaced at approximately 250-foot intervals around the fire loop. The hydrants will be located and the hose houses equipped in accordance with NFPA 24 and local fire codes. Valves requiring periodic testing will be accessible. An electric motor-driven jockey pump will maintain water pressure in the firewater distribution headers. During fire conditions, the electric motor-driven fire pump will start automatically when pressure in the firewater distribution header drops. The motor-driven pump will take suction under a positive head from the fire/service water storage tank. Once started, the pump will continue to run until manually stopped. Discharge from the pump will be connected to the underground yard loop.

Fixed fire protection systems will be provided for the steam turbine bearings and lube oil equipment and station transformers. Sprinkler and fixed spray systems will be designed and installed in accordance with NFPA 13 and NFPA 15, respectively.

In addition to the fixed fire protection system, portable CO_2 and dry chemical extinguishers will be located throughout the plant (including the switchgear rooms), with size, rating, and spacing in accordance with NFPA 10. Handcart CO_2 extinguishers will also be provided in the turbine area as necessary for specific hazards.

Local building fire alarms will be provided in accordance with NFPA 72. All materials will be free of asbestos and will meet the fire and smoke rating requirements of NFPA 255.

Access to the ESEC will be improved as part of the ESPFM. The changed location for the administration/ maintenance building, within the existing tank farm area, will enable improved access for facility and emergency services personnel, and visitors. This improvement will alleviate the current access routing that requires looping through the northern portion of the site from the site entrance. The improved access will go straight from the site entrance to the new location of administration/maintenance building.

2.8 Construction

Construction activities to support the decommissioning, demolition, and removal of existing Units 3 and 4 and the addition of ESPFM changes as described previously, will involve excavation from demolition activities as well as offsite hauling of demolition wastes, grading and construction of foundations, and site equipment installation. Figures 2-3a–2-3d show the project grading plan. Following the removal of Units 3 and 4, similar to the excavation that occurred with the removal of Units 1 and 2, the project owner intends to overexcavate the area to a uniform level that would enable the installation all of the underground piping and conduit prior to backfilling the area. A summary of estimated land disturbance is included in Table 2-18.

TABLE 2-18
Excavation Requirements

Excavation (cubic yards)	Admin/O&M Building Access Road	Admin/O&M Building	Gas Compressor
Cut	227	7703	889
Fill	7377		
Net	-7150		

Following completion of site preparation activities, construction and startup of the ESEC from site mobilization to commercial operation is expected to take a minimum of 20 months, as shown in Table 2-19. Construction of the facility is expected to accommodate concurrent efforts to minimize site constraints. The overall sequence of construction and startup includes construction foundations, installing major piping and equipment, connecting major site interfaces, erecting major structures, and startup/testing. The schedule and staffing requirements are described in the following sections by major components.

TABLE 2-19
Project Labor Needs and Available Labor by Craft/Skill

Craft	Total Number of Workers in Los Angeles County 1997[a]	Total Number of Workers in Los Angeles County Available 2004[b]	Maximum Number of Workers Needed for the Project[c]	Average Number of Workers Needed for the Project	California OES Code[d]
Specialized Insulation Workers	140	150	27	9	87802
Boilermakers/ironworkers	29,010	31,640	70	50	89100
Bricklayers/Masons	1,480	1,870	5	2	87302
Carpenters	16,870	20,200	64	26.5	87102
Electricians	11,680	13,570	55	28	87202
Laborers	13,810	16,640	64	32	98300
Millwrights	680	780	16	8	85123
Operating Engineers	6,900	8,190	25	12	95099
Painters	8,350	9,730	7	2	87400
Pipefitters/Sprinklerfitters	6,950	8,020	111	47	87502
Plasterers	8,350	9,730	26	1	87400
Sheetmetal workers	4,700	5,180	16	6	89132
Surveyors	630	440	11	4	22311
Field Staff	5,130	6,130	53	34	15017
Teamsters	25,040	30,550	8	3	97102

[a]Data from the State of California, Employment Development Department, Labor Market Information, Table 6, Occupational Employment Projections 1997 – 2004. Total workers calculated from the 1995 EDD estimated workforce for Los Angeles County. (EDD, 2000).
[b]Data from the State of California, Employment Development Department, Labor Market Information, Table 6, Occupational Employment Projections 1997 – 2004. Total workers calculated from the 1995 EDD estimated workforce.
[c]The maximum number of workers by each craft would be needed at different points in time during project construction. for Los Angeles County. (EDD, 2000).
[d]California OES Code for EDD Occupational Employment Project Data. Codes correlate to the craft/skill noted in this table.

Information based on Table 5.10-7 from 00-AFC-14.

2.8.1 Construction Schedule and Workforce

The construction and startup schedule is based on a double-shift through the site preparation period and the construction of the major equipment foundations and pedestals. This will be followed by a single-shift, 5-day workweek basis. Overtime and additional shift work may be used to maintain or enhance the construction schedule. Table 2-20 lists the projected total construction craft manpower by month for the ESEC. An estimated peak of 422 craft and professional personnel is anticipated in month 11 following construction mobilization.

TABLE 2-20
Construction Staffing Schedule

Month After Construction Mobilization	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Generating Facility																				
Insulation Workers										5	10	17	19	27	27	25	25	9	8	6
Boilermakers					8	11	24	26	31	31	31	28	26	24	15	15	5	5	4	4
Bricklayers and Masons			1	1	3	5	3	3	3	2	2	1	1	1	1	1	1	1	1	
Carpenters	12	15	28	40	50	64	39	42	38	34	29	25	25	23	18	15	10	5	5	4
Electricians	4	4	13	13	24	20	24	34	37	42	47	52	55	52	44	33	26	13	8	6
Ironworkers	3	8	11	19	24	21	53	36	39	36	33	26	21	15	13	10	10	5	5	
Laborers	16	23	38	48	54	64	37	40	42	39	39	37	37	29	29	21	18	10	8	6
Millwrights				5	5	12	7	10	14	14	16	13	13	10	10	9	9	4	4	2
Operating Engineers	4	7	11	9	9	13	13	16	17	18	19	19	19	15	14	12	8	5	3	2
Plasterers								1	1	3	3	5	4	5	2	2				
Painters								1	1	3	3	5	4	5	5	5	5	5	4	2
Pipefitters	4	9	16	20	31	31	40	53	56	87	93	101	102	81	72	30	27	24	15	3
Sheetmetal Workers									3	5	8	10	10	13	15	16	14	13	5	2
Sprinklerfitters								1	1	1	1	2	3	5	9	8	8	5	1	
Teamsters	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1	1	1
Surveyors	2	2	4	7	7	9	4	4	4	4	4	4	4	4	3	3	1	1		
Manual Staff Subtotal	**47**	**70**	**124**	**164**	**217**	**252**	**246**	**269**	**289**	**326**	**340**	**347**	**345**	**311**	**279**	**207**	**168**	**106**	**72**	**38**
Contractor Staff	5	13	24	37	48	48	35	37	45	45	49	49	47	44	41	34	30	13	11	6
Subtotal	**52**	**83**	**148**	**201**	**265**	**300**	**281**	**306**	**334**	**371**	**389**	**396**	**392**	**355**	**320**	**241**	**198**	**119**	**83**	**44**
Pipelines																				
Carpenters										3	3	3								
Electricians											2	2								
Laborers									7	8	8	7								
Operating Engineers									2	6	6	2								
Painters												2								
Pipefitters										2	2	2								
Surveyors	2	2					2	2	2	2	2	2								
Teamsters									2	6	6	4								

TABLE 2-20
Construction Staffing Schedule

Month After Construction Mobilization	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Manual Staff Subtotal	**2**	**2**					**2**	**2**	**13**	**27**	**29**	**24**								
Contractor Staff	1	1					1	1	2	4	4	2								
Subtotal	**3**	**3**					**3**	**3**	**15**	**31**	**33**	**26**								
TOTAL	**55**	**86**	**148**	**201**	**265**	**300**	**284**	**309**	**349**	**402**	**422**	**422**	**392**	**355**	**320**	**241**	**198**	**119**	**83**	**44**

Information based on Table 3.9-1 from 00-AFC-14.

2.8.2 Construction Plans

The construction staging and laydown area, as well as the construction worker parking area, will be at the locations indicated in Figure 2-10. A general contractor will be selected for the design, procurement, and construction of the facility. The general contractor for specialty work portions, as needed, will select subcontractors. Table 2-21 lists the demolition equipment required.

TABLE 2-21
Demolition Equipment Usage

	Equipment: Average Number/Day/Month					
Demolition Schedule After Notice to Proceed	**1**	**2**	**3**	**4**	**5**	**6**
Crawler Excavator w/Breaker	1			3	3	
Crawler Excavator w/Grapple	1	1	1	1	1	
Crawler Excavator w/Shear		2	3			
Crawler Excavator w/Pulverizer	1			2	2	
Skid Steel Loader	2	2	2	2	2	2
Track Loader	1	2	2	2	2	
Rubber Tire Loader	1	1	1	1	1	2
Water Truck	1	1	1	1	1	1
Stomper				1		
Hydro-Crane		2	2			
Crawler Crane		2	2			
Portable Crusher						1
Bottom Dumps				5		15
Ten Wheeler with Dump Bins	1	1	1	1	1	1
Semi-End Dumps	3	7	7	5	5	3
Tractor/Trailer	1	1	1	1	1	1
Total	**13**	**22**	**23**	**25**	**19**	**26**

Information based on Table 3.8-2 from 00-AFC-14.

2.8.3 Mobilization

The general contractor will mobilize within 6 months after full notice to proceed. The initial efforts will include site work, establishing site grading and storm water control, and establishing the laydown areas and construction parking. Tables 2-22 through 2-25 include information related to construction schedule and equipment usage.

TABLE 2-22
Schedule of Truck Deliveries/Demolition Materials (Excluding Heavy Equipment Deliveries)

	Total Number Of Trips Per Month					
Months After Notice to Proceed	**1**	**2**	**3**	**4**	**5**	**6**
Equipment Services	2	4	4	3	2	1
Oxygen & Propane	10	25	15	15	10	6
Diesel Fuel	8	25	25	25	15	10
Drinking Water	4	4	4	4	4	4
First Aid Supplied	1	1	1	1	1	1
Small Tools & Supplies	4	4	4	4	2	2
Trench Plate	2	1		3		
Subtotal	**31**	**64**	**53**	**55**	**34**	**24**
Average Daily	**1.5**	**3**	**2.5**	**2.5**	**1.5**	**1**

Information based on Table 3.8-3 from 00-AFC-14.

TABLE 2-23
Heavy Equipment Delivery Schedule

	Number of Mobilizations & Demobilizations per Month					
Months After Notice to Proceed	**1**	**2**	**3**	**4**	**5**	**6**
Excavator	4			2		6
Skid Steer Loader	1	1	1		1	2
Track Loader	1	1				2
Rubber Tired Loader	1				1	4
Water Truck	1					1
Stomper				1	1	
Cranes		4		4		
Portable Crusher						2
Total Heavy Equipment Deliveries	**8**	**7**	**1**	**7**	**3**	**17**
Average per day	**0.4**	**0.3**	**0.1**	**0.3**	**0.1**	**1**

Information based on Table 3.8-4 from 00-AFC-14.

TABLE 2-24
Construction Equipment Usage

Construction Schedule - Month After Mobilization	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
Generating Facility																				
Air Compresssors																				
Ingersoll Rand, diesel, 185 cfm, 75%, 8 hrs/day, 5 days/wk		3	3	5	5	8	11	13	16	16	16	16	16	10	10	9	3	1		
Paving Equipment																				
Asphalt paver, Cat, AP-800B, diesel,102 hp, 85%, 8 hrs/day, 5days/wk																2	2	2	2	
Compactors																				
Cat, CS-563, diesel, 145 hp 65%, 8hrs/day, 5 days/wk	1	1	1	1	1	1	1	1	1	1	1	1	1			1	1	1	1	
Portable Compression Equipment																				
Multiquip, Jumping Jack, MRT-80L, gas/oil, 2 cycle, 3.3 hp, 60%, 8hrs/day, 5 days/wk	1	1	2	2	2	2	2	2	2	2	2	1	1			1	1	1	1	
Multiquip, Plate Compactor, MVC-62H, gasoline, 4.6 hp, 60%, 8 hrs/day, 5 days/wk		1	1	2	2	2	2	2	2	2	1	1	1			1	1	1	1	
Concrete Vibrators																				
North Rock, flex shaft vibrator, electric, 15 amps, 50%, 8hrs/day, 5days/wk		2	2	5	5	6	6	6	6	6	5	5	4	2	2					
Light Towers																				
Magnum, Nightbuster 5000, 440000lumen, 6000W, 15.5 hp, 70%, 10 hrs/day, 5 days/wk	2	2	2	2	2	2	2													
Dozer																				
Cat, D8U, diesel, 285 hp, 70%, 8 hrs/day, 5 days/wk	1	1	2	2	2	2	2	2	1	1	1	1	1			1	1	1	1	
Excavator, Backhoe																				
Cat, 312, diesel 84 hp, 75%, 8 hrs/day, 5 days/wk	1	1	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	
Excavator, Loader																				
Cat, 936 F, diesel, 200 hp, 80%, 8 hrs/day, 5 days/wk	1	1	1	1	1	1														
Cat, 938 F, diesel, 140 hp, 80%, 8 hrs/day, 5 days/wk	1	1	2	2	1	1														

TABLE 2-24
Construction Equipment Usage

Construction Schedule - Month After Mobilization	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
Excavator, Motor Grader																				
Cat, 140G, diesel, 150 hp, 90%, 8hrs/day, 5 days/wk	1	1	1	1	1	1										1	1	1	1	
Cranes, 225 Ton																				
Manitowoc, 4100W, diesel, 350 hp, 70%, 8 hrs/day, 5 days/wk						1	1	1	1	1	1	1	1							
Cranes, 150 Ton																				
Manitowoc, diesel, 250 hp, 70%, 8 hrs/day, 5 days/wk						1	1	1	1	1	1	1	1							
Cranes, 40 Ton			1	1	2	2	2	2	2	2	2	2	2	2	1	1				
Grove, RT700B, diesel, 185 hp, 50%, 8 hrs/day, 5 days/wk																				
Cranes, 20 Ton		1	1	3	3	4	4	4	4	4	3	3	3	2	2	1	1			
Grove, RT400, diesel, 185 hp, 50%, 8 hrs/day, 5 days/wk																				
Water Trucks				1	1	1	1	1	1	1	1	1	1	1	1	1				
International, diesel, 600 gal, 50%, 8hrs/day, 5days/wk																				
Welders		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1				
Multiquip, GA 3600, gasoline, 7.5 hp, 70%, 8 hrs/day, 5 days/wk																				
Multiquip, BLW-300SS, diesel, 23 hp, 75%, 8 hrs/day, 5 days/wk		1	3	4	8	8	9	15	16	20	20	20	20	20	15	14	7	3	3	2
Trucks, Fuel/Lube			1	1	1	3	3	5	5	6	6	6	6	6	4	3	1			
International, diesel, 210 hp, 50%, 8 hrs/day, 5 days/wk																				
Trucks, Large		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1				
Cat, D200, articulated truck, diesel, 180 hp, 65%, 8 hrs/day, 5 days/wk																				
Ford flatbed, diesel, 180 hp, 80%, 8 hrs/day, 5 days/wk	1	1	3	3	3	3	3	3	3	3	3	2	2							
Radios	3	3	4	4	4	4	4	4	4	4	4	4	4	4	4	3	3	2	1	
Hand held radios																				
Tanks, Fuel/Lube	4	9	16	20	23	23	26	26	26	31	31	32	31	29	23	21	16	8	8	4
750 gallons each																				

TABLE 2-24
Construction Equipment Usage

Construction Schedule - Month After Mobilization	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
Truck, Concrete Pump		1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1		
International, diesel, 190 hp, 60%, 8/5																				
Subtotal		1	2	3	3	3	3	3	3	3	3	3	3	2	1	1				
Water Supply Pipeline	**17**	**34**	**53**	**69**	**76**	**84**	**88**	**96**	**99**	**109**	**105**	**104**	**102**	**83**	**68**	**66**	**40**	**23**	**20**	**6**
Air Compresssors																				
Ingersol-Rand diesel, 185 cfm, 76%, 8 hrs/day, 5 days/wk																				
Compactors									1	1	1	1								
Cat, CS-563, diesel, 145 hp 65%, 8 hrs/day, 5 days/wk																				
Portable Compression Equipment									1	1	1	1								
Multiquip, Jumping Jack, MRT-80L, gas/oil, 2 cycle, 3.3 hp, 60%, 8hrs/day, 5days/wk																				
Multiquip, Plate Compactor, MVC-62H, gasoline, 4.6 hp, 60%, 8 hrs/day, 5 days/wk									1	1	1	1								
Concrete Vibrators									2	2	2	2								
North Rock, flex shaft vibrator, electric, 15 amps, 50%, 8 hrs/day, 5 days/wk																				
Dozer											1	1								
Cat, D6U, diesel 265hp, 70%, 8 hrs/day, 5 days/wk																				
Excavator, Backhoe									1	1	1	1								
Cat, 312, diesel, 84 hp, 75%, 8 hrs/day, 5 days/wk																				
Excavator, Loader									1	1	1	1								
Cat, 900F, diesel, 150 hp, 75%, 8 hrs/day, 5 days/wk																				
Paving Equipment									1	1	1	1								
Asphalt paver, Cat, AP-800B, diesel, 102 hp, 85%, 8 hrs/day, 5days/wk																				
Excavator, Motor Grader											1	1								
Cat, 140G, diesel, 150 hp, 90%, 8 hrs/day, 5 days/wk																				

TABLE 2-24
Construction Equipment Usage

Construction Schedule - Month After Mobilization	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Cranes, 40 Ton									1	1	1	1								
Grove, RT700B, diesel, 185 hp, 50%, 8 hrs/day, 5 days/wk																				
Cranes, 20 Ton									1	1	1	1								
Grove, RT400, diesel, 185 hp, 50%, 8 hrs/day, 5 days/wk																				
Water Trucks												1								
International, diesel, 500 hp, 50%, 8 hrs/day, 5 days/wk																				
Trucks, Fuel/Lube									1	1	1	1								
International, diesel, 210 hp, 50%, 8 hrs/day, 5 days/wk																				
Radios									1	1	1	1								
Hand held radios																				
Subtotal	3	3							3	4	4	3								
TOTAL	3	3							15	16	18	18								
	20	**37**	**53**	**69**	**76**	**84**	**88**	**96**	**114**	**125**	**123**	**122**	**102**	**83**	**68**	**66**	**40**	**23**	**20**	**6**

Information based on Table 3.9-2 from 00-AFC-14.

TABLE 2-25
Construction Schedule for Truck Deliveries of Equipment (Excluding Heavy Equipment Deliveries)

Month After Construction Mobilization	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Equipment and Materials																				
Generating Facility																				
Heat Recovery Steam Generators							5	20	30	39	44	34	34	25	14	10				
Combustion Turbine/Generator							5	13	25	32	34	29	19	10	10					
SteamTurbine/Generator									3	5	8	10	7	7	3	3				
Mechanical Equipment			5	5	16	16	32	32	54	54	53	53	32	26	13	5	3			
Electrical Equipment and Materials		3	3	8	8	11	16	16	32	32	32	43	37	27	16	16	5	5		
Piping, Supports & Valves		3	4	8	14	27	43	43	53	54	64	53	32	26	16	5	5			
Concrete and Rebar		50	197	245	484	484	105	87	43	17	9									

TABLE 2-25
Construction Schedule for Truck Deliveries of Equipment (Excluding Heavy Equipment Deliveries)

Month After Construction Mobilization	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Miscellaneous Steel/Architectural				5	5	16	27	32	32	26	10	5								
Consumables/Supplies	14	16	35	38	43	43	43	43	43	46	46	46	46	37	37	27	27	10	10	3
Contractor Mobilization & Demobilization	11	11	16	10	5										3	10	16	10	10	3
Construction Equipment	5	5	11	8	8	5	5	5	4	4	2	2	1	1	3	3	5	3	3	
Subtotal	**30**	**88**	**271**	**327**	**583**	**602**	**281**	**291**	**319**	**309**	**302**	**275**	**208**	**159**	**115**	**79**	**61**	**28**	**23**	**6**
Average Daily	**1.4**	**4.2**	**12.9**	**15.6**	**27.8**	**28.7**	**13.4**	**13.9**	**15.2**	**14.7**	**14.4**	**13.1**	**9.9**	**7.6**	**5.5**	**3.8**	**2.9**	**1.3**	**1.1**	**0.3**
Supply Pipeline																				
Electrical Equipment and Materials										4	4	4								
Piping, Supports & Valves									10	12	10	4								
Concrete and Rebar									12	23	4	4								
Miscellaneous Steel/Architectural											2	4								
Consumables/Supplies									8	12	12	4								
Construction Equipment								2	10	2		9	3							
Subtotal								**2**	**40**	**53**	**32**	**29**	**3**							
Average Daily								**0.1**	**1.9**	**2.5**	**1.5**	**1.4**	**0.1**							

Information based on Table 3.9-3 from 00-AFC-14.

2.8.4 Oversize Equipment Delivery

The delivery of equipment will use the routes identified in the 2007 and 2010 PTA and Supplement. No beach delivery is planned.

2.8.5 Construction Office Facilities

Construction offices will be set up in trailer or modular facilities on the ESGS property. These will be used to manage the day-to-day aspects of the construction efforts of the owner, engineer, contractor, and subcontractors. Temporary water, power, communication, and sanitary facilities will be established to service the construction offices, as needed.

2.8.6 Construction Laydown and Parking

Areas will be established within the site boundary, as well as at a location near the site. The laydown areas are the same as those identified in the 00-AFC-14 Final Decision. The offsite laydown and parking area is approximately 12 acres, of which 10 acres are usable, located at 777 W. 190th Street in the city of Gardena, near the 405 and 110 freeway interchange (Figure 2-1). This site is less than 10 miles southeast of ESGS and is readily accessible to approved traffic routes to the ESGS. The site has been used for construction laydown for the ESEC project since 2011 and will return to its prior use for commercial truck, RV, and automobile storage until ESPFM construction commences in 2016. The offsite laydown site is paved, lighted, and enclosed with a perimeter fence and has an approximately 5,500 square foot industrial building on the property. Laydown and storage will be handled in three phases. Those items requiring long-term storage will be located at the offsite facility shown in Figure 2-10. Components scheduled to be placed into their final location will be staged onsite in the area of the currently abandoned fuel oil storage tanks at the south end of the property. Components located here will be temporary and on a revolving short-term basis. As construction logistics allow, some items will be located directly in the work area, which will be incorporated into the facility or its final location in the very near term.

A construction parking facility will be established onsite and/or at a location near the plant site as shown on Figure 2-1. This area will provide adequate parking space for construction personnel and visitors during construction. The area will be maintained for stability and safety. Construction workers will be transported to and from the established offsite location at the beginning and end of each work shift.

2.8.7 Emergency Facilities

Emergency services will be coordinated with the local fire department and hospital. The existing facility services will also be used as available and capable. An urgent care facility will be contacted to set up non-emergency physician referrals. First-aid kits will be provided around the site and regularly maintained. At least one person trained in first aid will be part of the construction staff. In addition, all foremen and supervisors will be given first-aid training. Fire extinguishers will be located throughout the site at strategic locations at all times during construction.

2.8.8 Construction Utilities

During construction, temporary utilities will be provided to the construction offices, laydown areas, and the project site. Temporary construction power will be supplied by strategically distributed utility-furnished power and by portable generators. Area lighting will be provided and located for safety and security. Construction water will be provided by available onsite sources and distributed to the construction area. Drinking water will be distributed daily. Average daily use of construction water is expected to be about 5,000 gallons. During hydrotest, water usage is estimated at 20,000 gallons per day. Used hydrotest water will be discharged through a General NPDES permit for hydrotest water. Portable toilets will be provided throughout the site.

2.8.9 Site Services

The following site services will also be provided, either by separate contract, or incorporated into individual construction subcontracts for the ESGS:

- Environmental health and safety training
- Site security
- Site first aid
- Construction testing (e.g., NDE, hydro, soil, concrete)
- Furnishing and servicing of sanitary facilities
- Trash collection and disposal
- Disposal of hazardous materials and waste in accordance with local, state, and federal regulations.

2.8.10 Construction Materials and Equipment

Construction equipment usage information is included in Tables 2-22 through 2-25. Truck deliveries will occur weekdays between 6:00 a.m. and 6:00 p.m. During the period of double shift work, it is expected that deliveries will also be required at other hours outside of the delivery times described herein to support the second shift activities. These deliveries are expected to be primarily concrete. Estimated average daily frequency of truck deliveries is shown in Table 2-22. Materials such as concrete, pipe, wire and cable, fuels, reinforcing steel, and small tools and consumables will be delivered to the site by truck. Most of the heavy equipment items will be transported by rail to the common shipping depot nearest to the site. Rail deliveries will be off-loaded and transported to the site by common carrier. Table 2-25 lists the projected delivery of major equipment components.

2.8.11 Construction Sequence and Schedule

Installation involves the following steps:

Step 1: Decommissioning

- Environmental assessment
- Removal of asbestos and hazardous materials

Step 2: Demolition and Offsite waste disposal

- Mobilize plant shutdown and demolition
- Demolition/heavy wrecking
- Pull Down Units 3 and 4 elevation 20 foot - 90 foot
- Demolish at grade and below grade concrete
- Crush onsite asphalt/concrete rubble
- Mass haul asphalt/concrete
- Demobilization.

Step 3: Grading and Recontouring

- Cut and fill power block
- Cut and fill balance of site
- Final grading and paving

Step 4: Foundation and Piping Installation

- Dry cooling tower foundations
- HRSG foundations
- Combustion turbine foundations
- Pipe rack foundations
- Steam turbine pedestal foundations
- Balance of plant foundations
- Underground utilities piping and electrical

Step 5: Concrete and gravel installation prior to aboveground equipment installation

CC Fast CTG Installation Steps

- Erect HRSG
- Erect dry cooling tower
- Erect pipe rack steel
- Erect combustion turbine generator
- Install balance of plant equipment
- Erect steam turbine
- Install above ground piping
- Install electrical equipment and instrumentation & controls

Rolls Royce Trent 60 Installation Steps

Step 1: Install the main gas skid baseplate. (Includes all required engine lubrication and fuel systems as well as the remote I/O module)

Step 2: Install the gas turbine enclosure roof, ventilation system, and exhaust transition.

Step 3: Install air filter and support structure.

Step 4: Install auxiliary equipment skids.

Step 5: Install Trent 60 gas turbine.

Step 6: Install driven equipment which can be done concurrent with the other steps.

Commercial operation is expected in 2018. Total construction schedule is estimated to be approximately 18 to 20 months.

2.9 Facility Operation

This section discusses operation and maintenance procedures that would be continue to be undertaken by the project owner to ensure safe, reliable, and environmentally acceptable operation of the ESEC. Operation of the project is expected to require up to 50 full-time employees. Plant operations will be controlled from the existing operator's panel, located in the existing control room. A distributed control and information system (DCS) will provide modulating control, digital control, and monitoring and indicating functions for operation of the plant power block systems.

2.9.1 Power Plant Facility

The project includes decommissioning, demolishing, and replacing the existing Units 3 and 4 steam boiler plants with approximately 449 MW gross / 435 MW net of new natural-gas-fired electrical generating capacity. By removing Units 3 and 4, the need for once through ocean water cooling will be eliminated and the project will improve electricity generation by adding fast start and dispatch flexibility capabilities to support southern California grid load balancing.

2.9.2 Operation with Seasonal Variation in Ambient Temperature

Output from the combustion turbine generators (CTGs) is sensitive to the temperature and density of the ambient air taken into the CT inlet and used in the combustion process. Inlet cooling has been added to the CC Fast unit to reduce the inlet air temperatures when the CT is at base load and ambient temperatures exceed 59°F. Caldwell wet compression systems are fitted to the Trent 60 units to reduce compressor work and lower the temperature of the high-pressure compressor discharge air at ambient temperatures above approximately 45°F. This reduces the impact of ambient temperature on electrical output and efficiency during the summer peaks when the electrical customer's usage is at its highest.

2.9.3 Annual Operating Practices

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

2.9.4 Facility Controls

Consistent with the installation of Units 5 through 8, the combined facility control system will consist of a state-of-the-art, integrated microprocessor-based distributed digital control and monitoring system (DCS). The DCS will provide for startup, shutdown, and control of plant operation limits, and will provide protection for the equipment. Interlock and logic systems will be provided via hard-wired relays, the DCS, or programmable controllers. Process switches (i.e., pressure, temperature, level, etc.) used for protective functions will be connected directly to the DCS and the protective system.

The facility controls will be designed with a high degree of automation in order to reduce the required actions performed by operating personnel. Where it is not beneficial, systems will not be automated. Through subsystem automation and DCS, the number of individual control switches and indicators that confront the operator will be greatly reduced, improving operations and safety.

The majority of the facility operation equipment will be located in the control room. The control room contains DCS-type control consoles and the auxiliary control panels. In addition, the control room contains the alarm, utility, and log printers.

Local control panels or stations will be furnished only where operator attention is required to set up a system for operation, or where the equipment requires intermittent attention during plant operation. Main control room indication and control will only be duplicated for those variables critical to plant availability.

2.9.4.1 Communications Network

Functionally distributed and redundant microprocessor-based subsystem controllers will communicate with the main control room via a redundant high-speed communications network.

The communications network will provide unit-wide data access for centralized operation and engineering functions, through DCS. Remote I/O capability will be provided to allow the DCS to interface with remote equipment and to reduce the quantity of long cable runs.

DCS functions and miscellaneous tasks include:

- Perform analog and digital plant control functions to accommodate a consistent operator interface for controlling the power plant equipment.
- Monitor both analog and digital signals to provide the operator/engineer with access to the data around the network.
- Perform alarm monitoring in the main control room for the entire plant.
- Provide graphic displays for all systems and equipment, including electrical systems and controller faceplates.
- Provide data logging and reporting via displays and printed reports.
- Provide long-term data storage of process history.

2.9.5 Reliability and Redundancy

Critical functions and parameters will have redundant sensors, controls, indicators, and alarms. The system will be designed such that critical controls and indications do not fail due to a failure in the control system implementation of redundancy logic. Control systems in general, and especially the protection system, will be designed according to stringent failure criteria.

Measurement redundancy will be provided for all critical plant parameters. DCS microprocessors will be fully redundant with automatic tracking and switchover capability in the event of a failure of the primary microprocessor. Two fully redundant data communications networks will be provided. The system will permit either network to be disconnected and reconnected while the system remains on-line and in control. The control system will incorporate on-line self-diagnostic features to verify proper operation of system hardware, software, and related support functions such as control power, field contact interrogating power, and the system modules in position.

2.9.6 Utilities

The West Basin Municipal Water District and the Cities of El Segundo and Manhattan Beach (Metropolitan Water District of Southern California) will own, operate, and maintain the reclaim water and city water supply pipelines, respectively. As owners of the offsite water supply pipelines and associated facilities, they will operate and maintain these lines in accordance with applicable regulations and their normal operating procedures.

Operation and maintenance of the natural gas pipeline will be performed by SoCalGas in accordance with applicable Federal Energy Regulatory Commission and Department of Transportation regulations. This existing pipeline will continue to receive periodic inspections as a part of SoCalGas' pipeline maintenance program. Sanitary waste will be discharged to the existing municipal sewer system operated by the City of Manhattan Beach Public Works Department. The connection to the system will be built, owned and operated by the Public

Works Department. Operation and maintenance of the pipeline will be performed in accordance with applicable regulations and industry standards.

2.10 Facility Closure

Facility closure can be either temporary or permanent. Facility closure can result from: 1) sudden and unexpected closure due to unplanned circumstances, such as a natural disaster or temporary fuel shortage; or 2) planned closure in an orderly manner, such as at the end of its useful economic or mechanical life or due to gradual obsolescence. The two types of closure are discussed in the following sections.

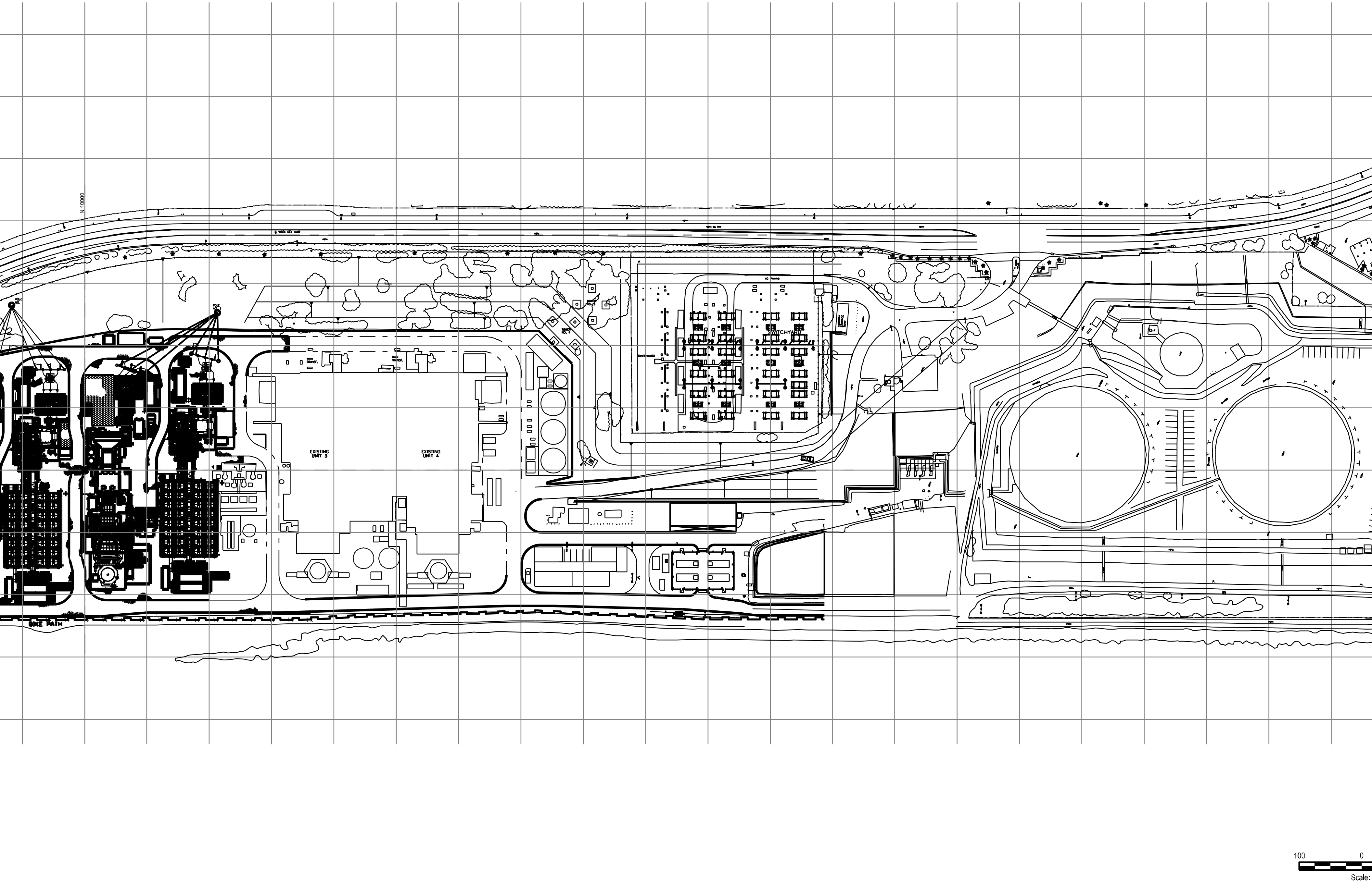
Temporary or unplanned closure can result from a number of unforeseen circumstances, ranging from natural disaster to economic forces. For a short-term unplanned closure, where there is no facility damage resulting in a hazardous substance release, the facility would be kept “as is,” ready to re-start operating when the unplanned closure event is rectified or ceases to restrict operations.

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

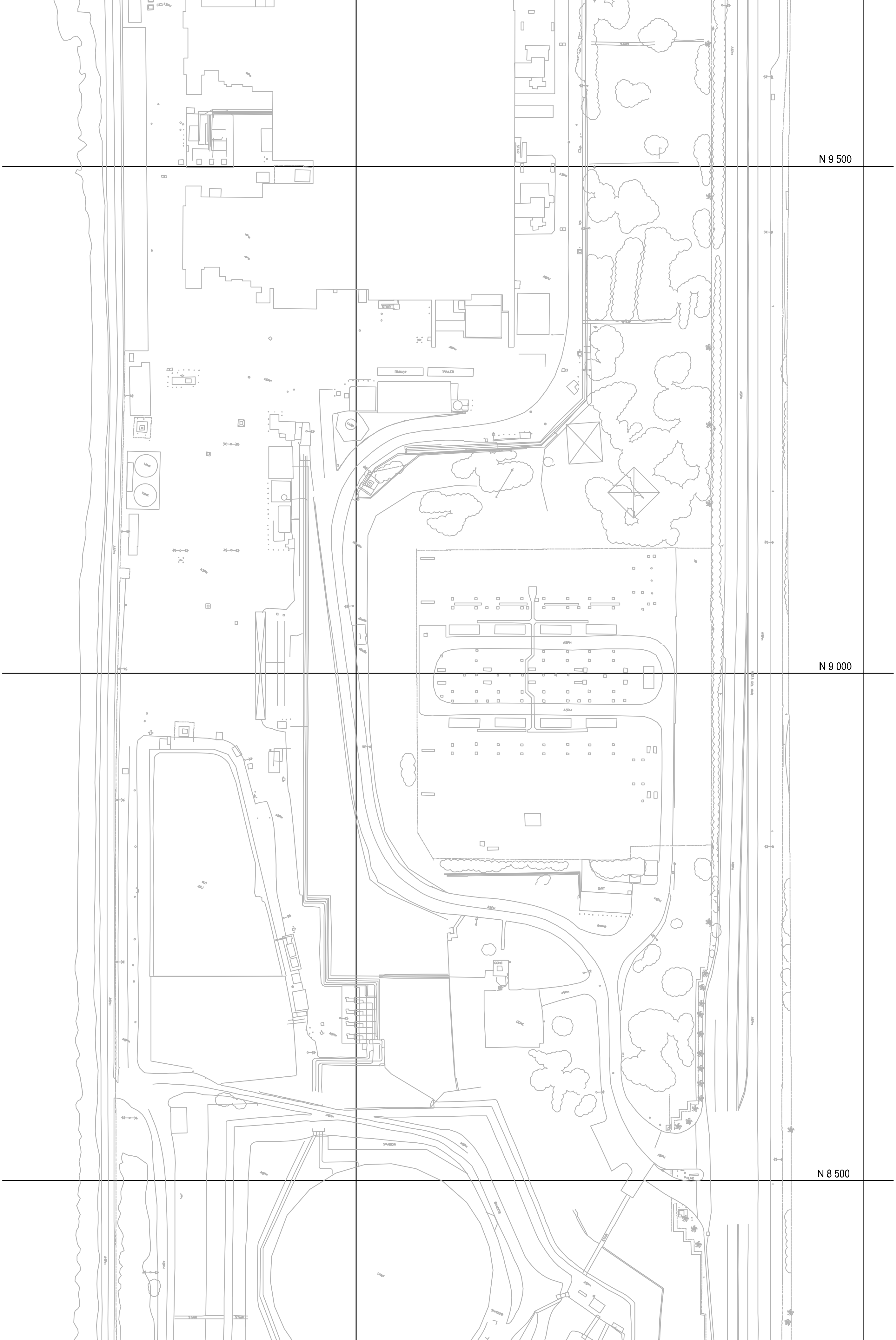
At the time of facility closure, decommissioning will be completed in a manner that protects the health and safety of the public and is environmentally acceptable. Prior to a planned closure, the Owner will submit a specific decommissioning plan that will include the following:

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

Once land is used for industrial or commercial purposes, it rarely reverts back to its natural state. Reuse of the land will be encouraged in this case, as opposed to taking additional land for future industrial or commercial purposes. If the plant site is to return to its natural state, the specific decommissioning plan will include a discussion covering the removal of all aboveground and underground objects and material.



N 10000
SWITCHYARD
EXISTING UNIT 3
EXISTING UNIT 4
BIKE PATH
100
0
Scale: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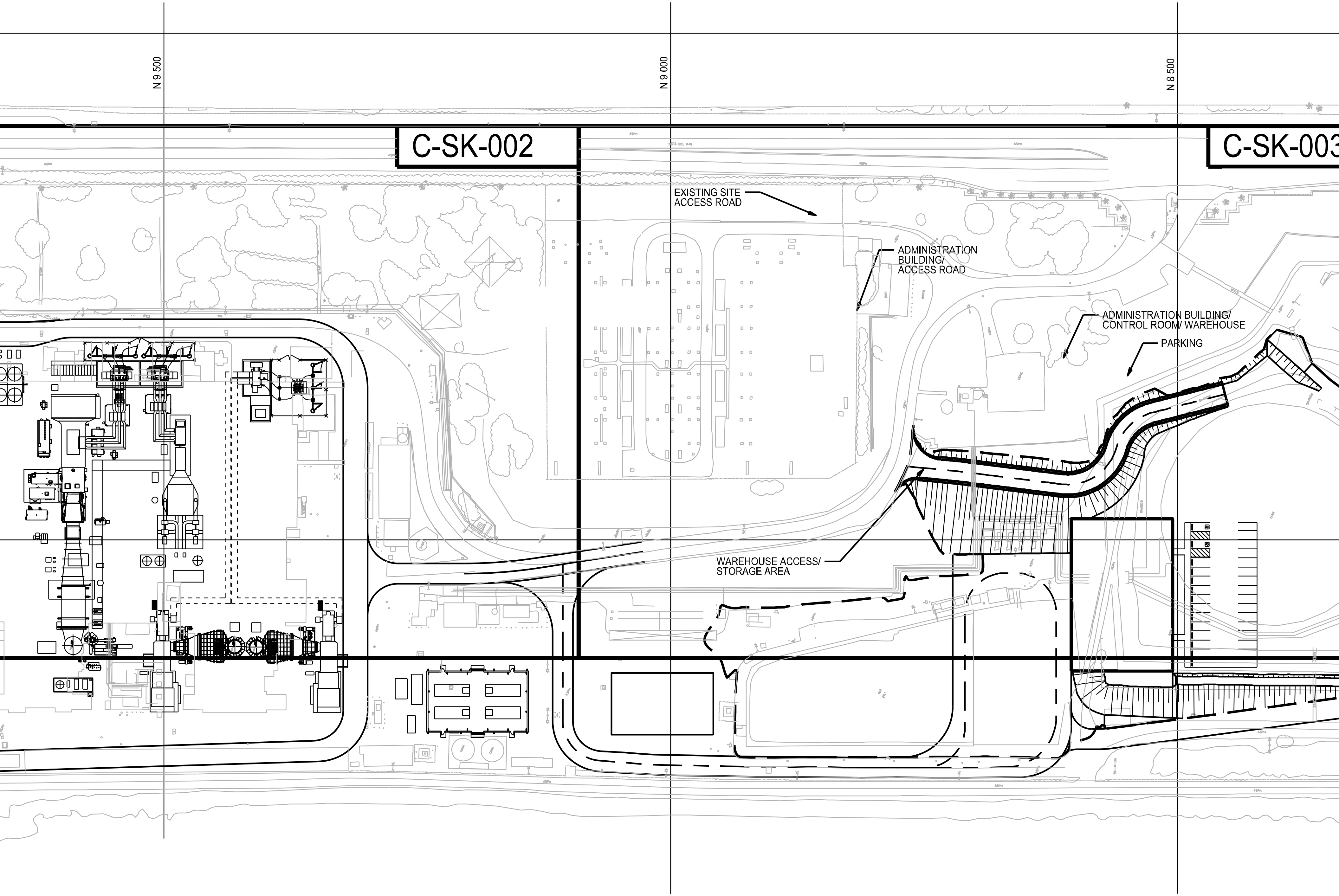
N 9 000
N 8 500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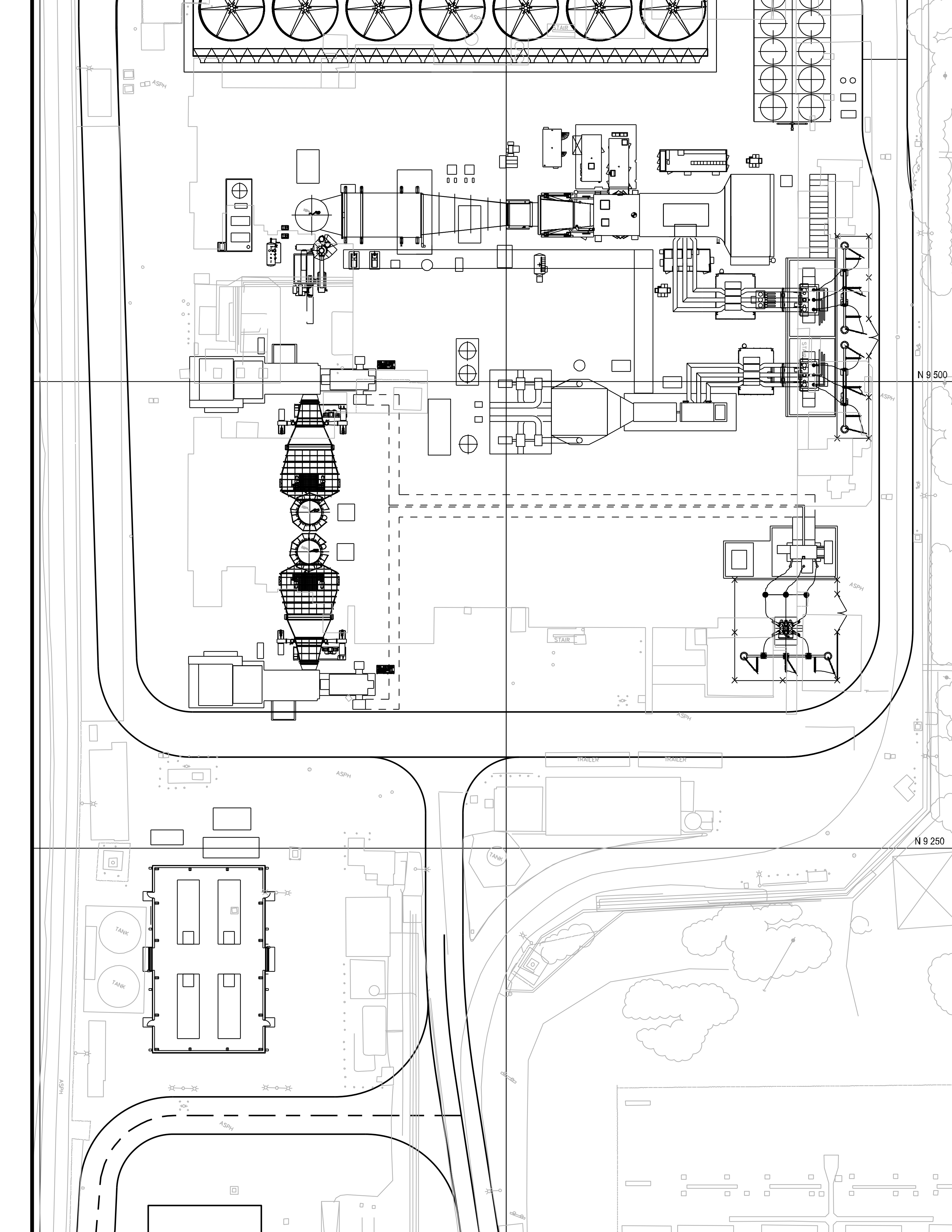
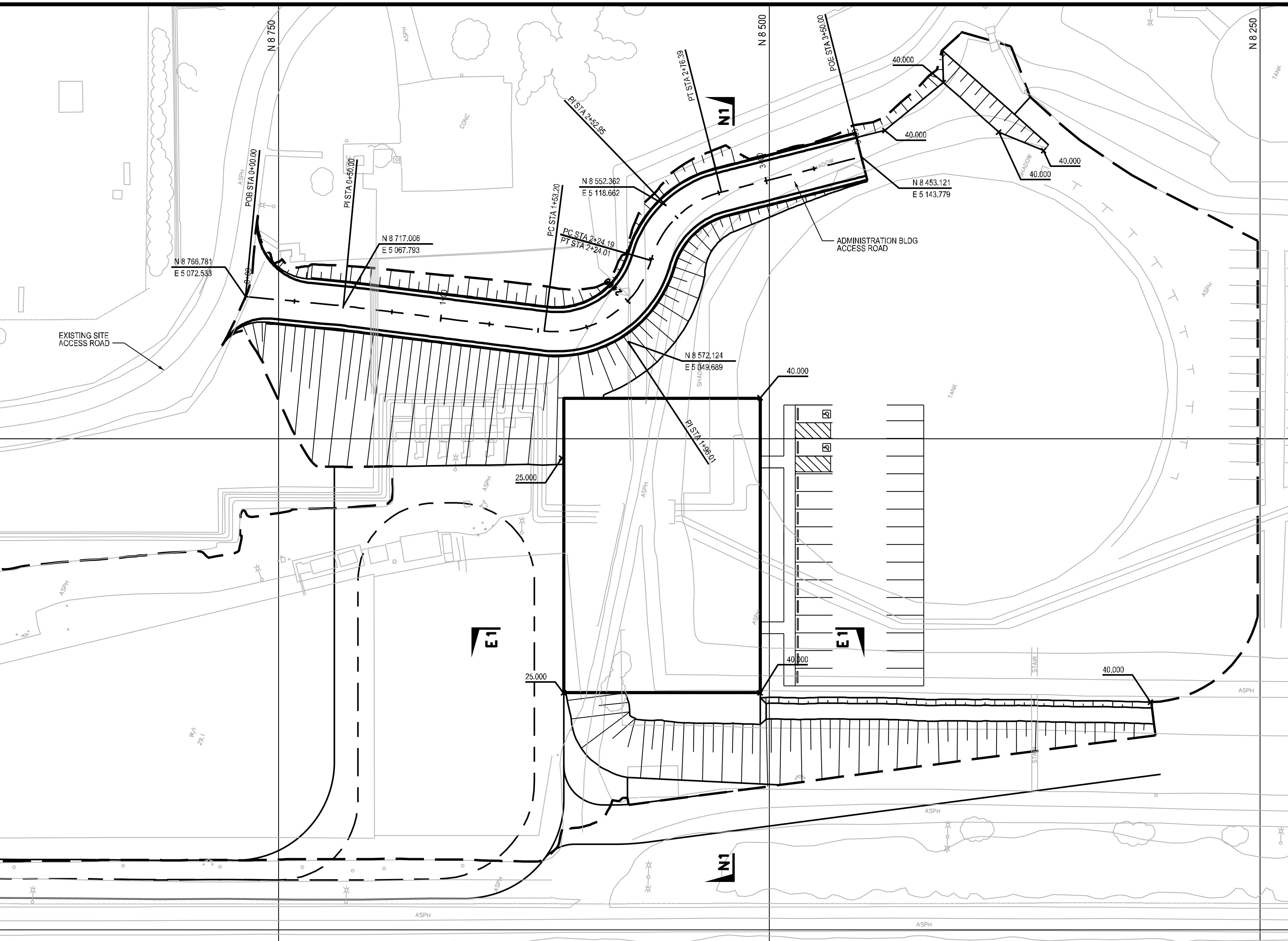
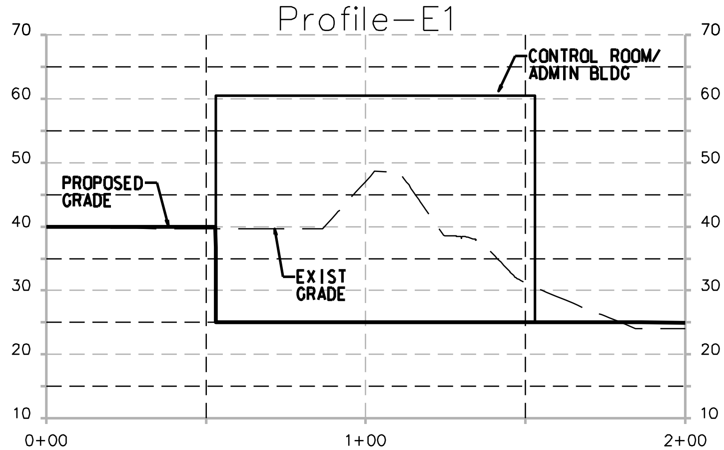
N 9 000
N 8 500
C-SK-002
C-SK-003
EXISTING SITE ACCESS ROAD
ADMINISTRATION BUILDING/ ACCESS ROAD
ADMINISTRATION BUILDING/ CONTROL ROOM/ WAREHOUSE
PARKING
WAREHOUSE ACCESS/ STORAGE AREA

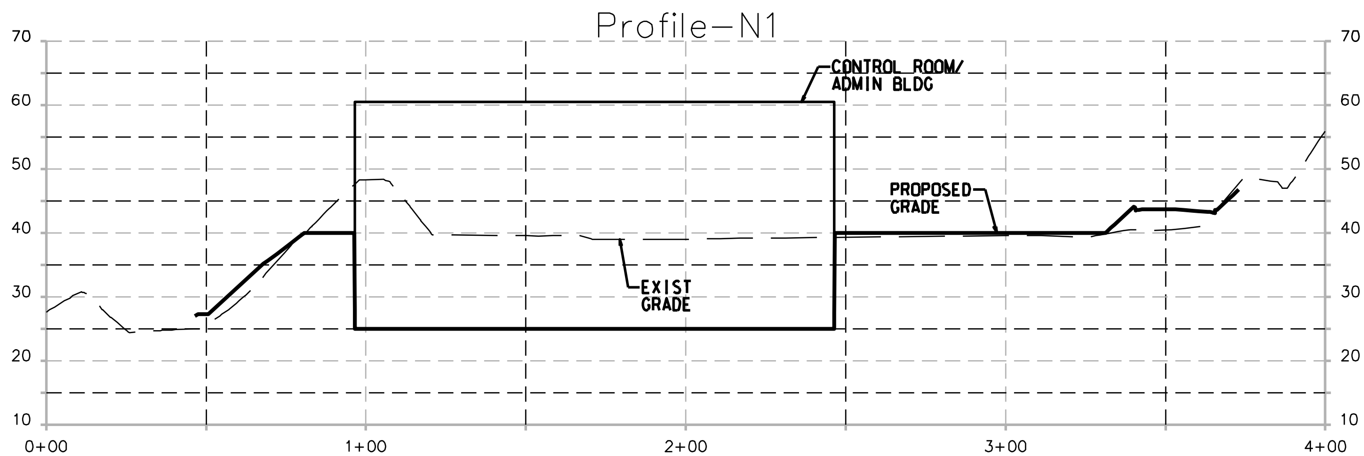


N 9 500
N 9 250
ASPH
STAIR
TRAILER
TRAILER
TANK
TANK
TANK

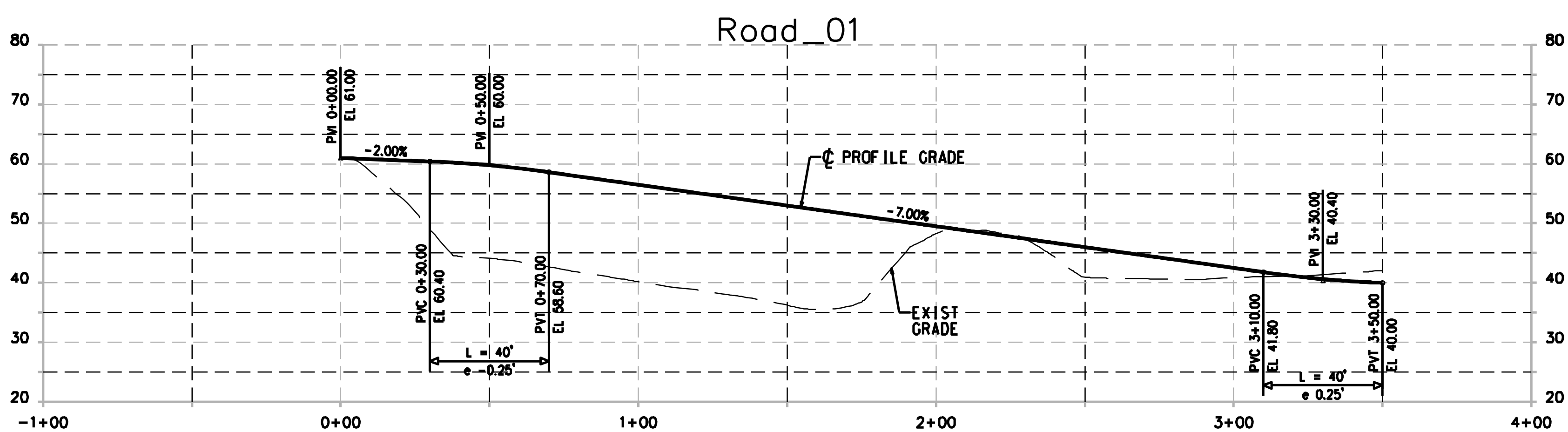

N 8 750
N 8 500
N 8 250
POB STA 0+00.00
N 8 766.781
E 5 072.533
PI STA 0+50.00
N 8 717.006
E 5 067.793
PC STA 1+53.20
PC STA 2+24.19
PT STA 2+24.01
N 8 552.362
E 5 118.662
PI STA 2+52.95
PT STA 2+76.39
POE STA 3+50.00
N 8 453.121
E 5 143.779
ADMINISTRATION BLDG
ACCESS ROAD
N 8 572.124
E 5 049.689
PI STA 1+96.01
EXISTING SITE
ACCESS ROAD
40.000
25.000
N1
E1
ASPH
CONC
TANK
SHADOW
STAIR



PROFILE LOOKING WEST @ E 4903

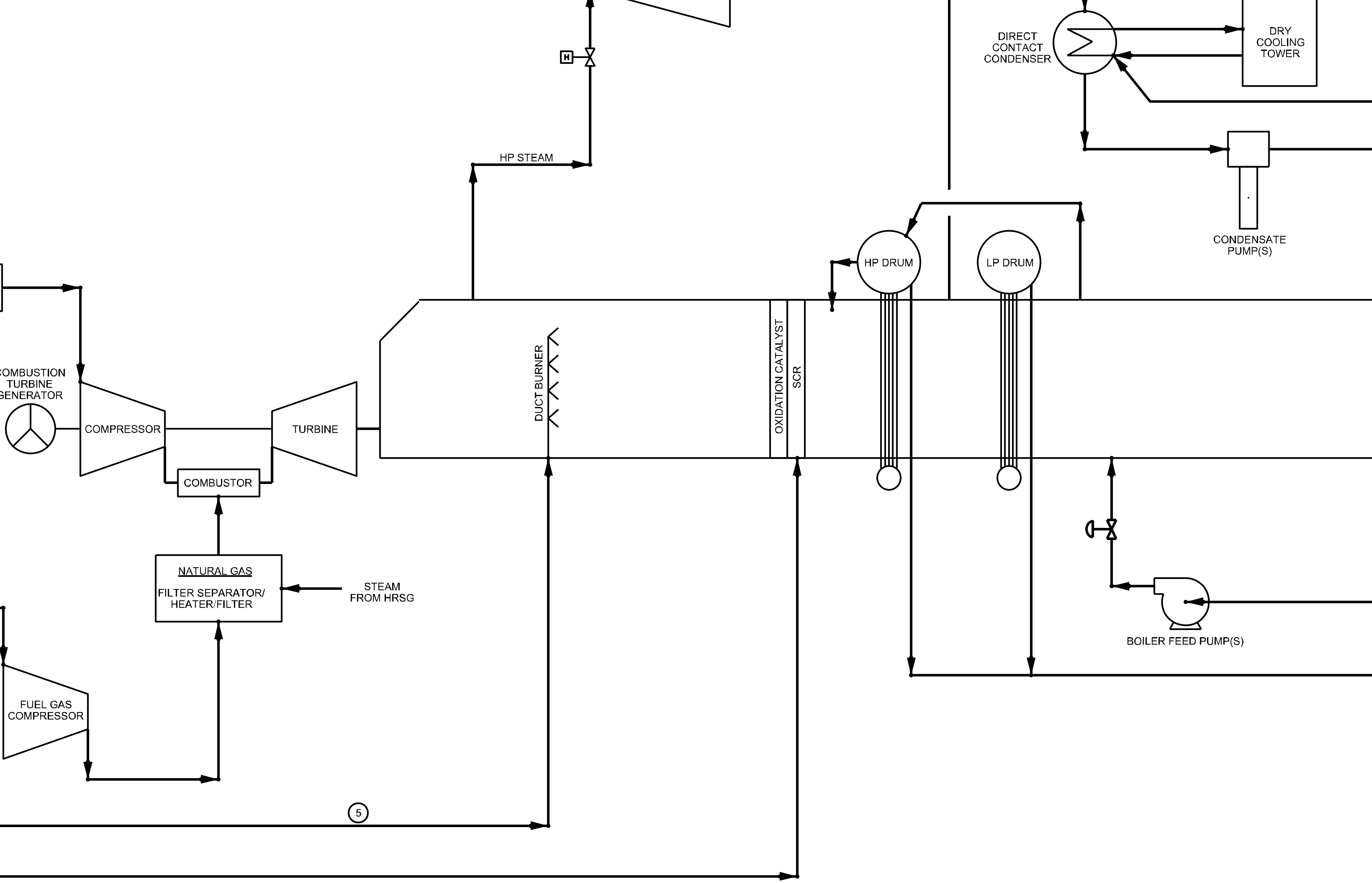


PROFILE LOOKING NORTH @ N 8518

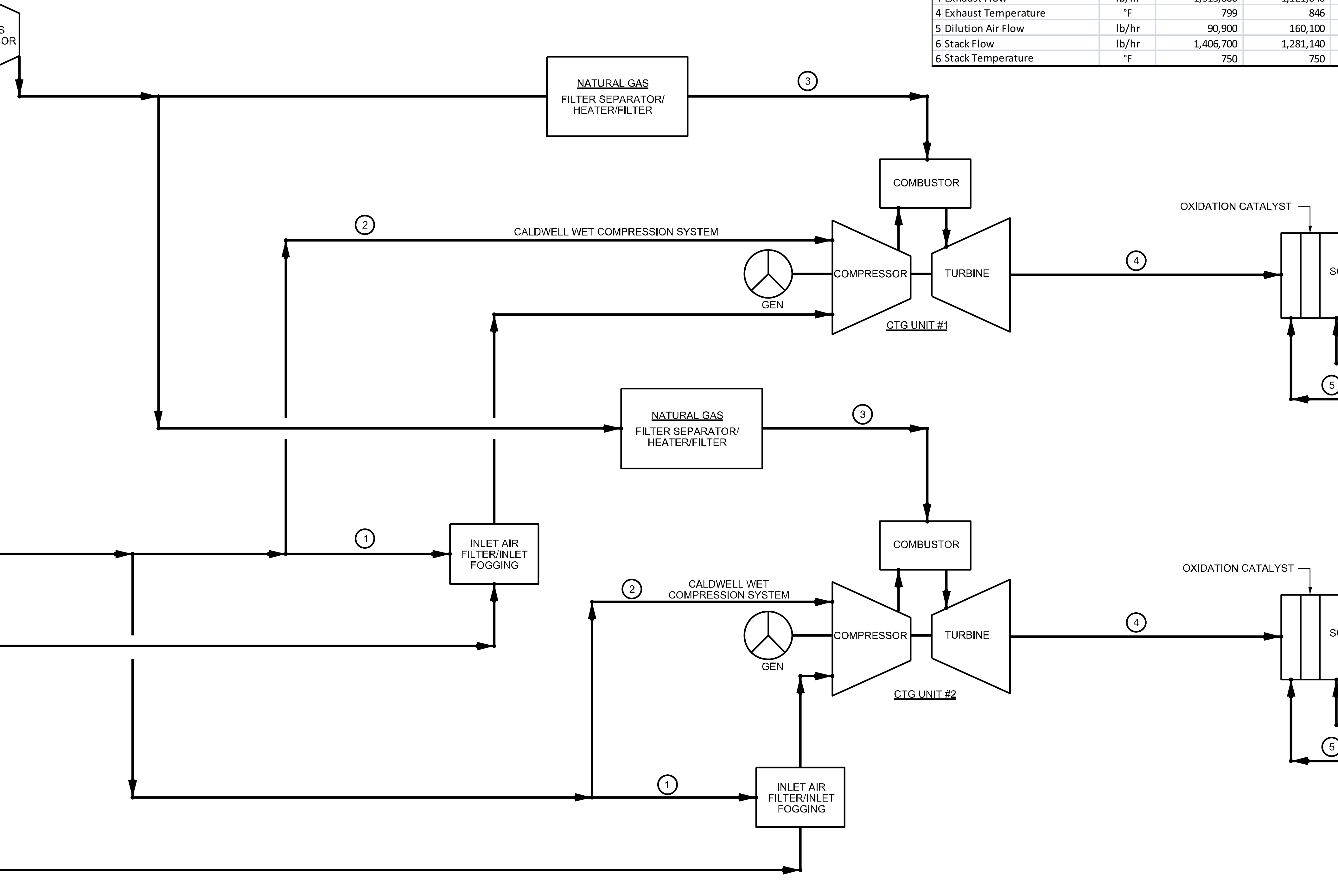


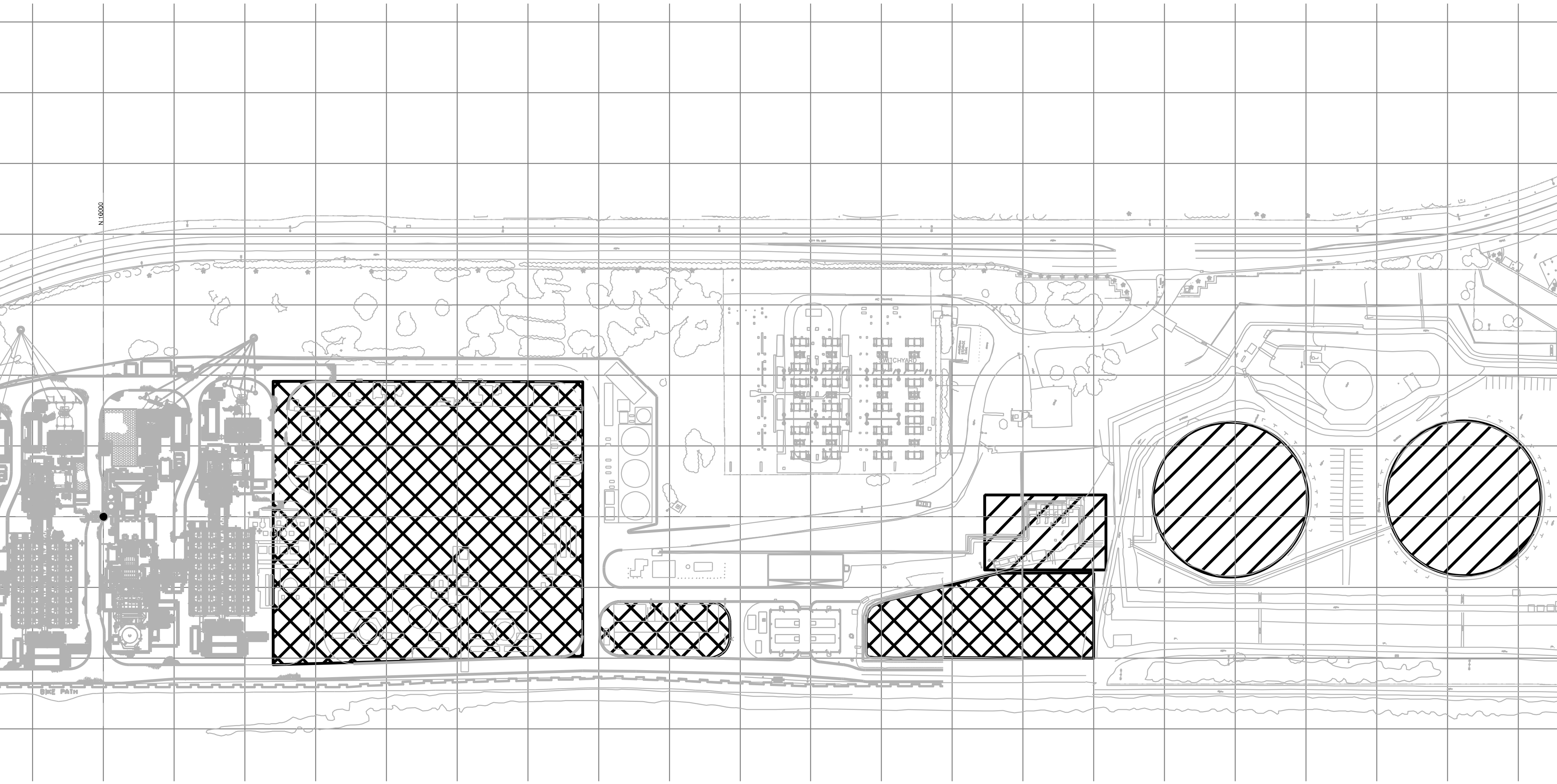
ADMINISTRATION BUILDING ACCESS ROAD

	100% Load, Fired	RH, 100% Load, Unfired	RH, 100% Load, Fired	100% Load, Unfired	100% Load, Fired
08.0	333.7	295.2	315.7	288.1	305.5
350	6,588	6,396	6,739	6,480	6,857
-	-	10,490	10,490	13,380	13,380
111	8,841	7,077	8,808	7,026	8,773
111	8,841	7,077	8,808	7,026	8,773
730	94,730	91,450	91,450	89,790	89,790
-	11,720	-	11,580	-	11,670
000	4,244,000	4,146,000	4,158,000	4,084,000	4,096,000
233	219	245	244	253	254



	Parameter	Units	41°F, 76% RH, 100% Load	77.8°F, 49.6% RH, 100% Load
	Gross Power Output	MW	57.7	46.0
	Gross Heat Rate (LHV)	Btu/kW-Hr	7,988	8,428
1	Water Flow (Evap Cooler)	lb/hr	-	-
2	Caldwell Wet Compression Water Flow (Demin)	lb/hr	-	-
3	Fuel Flow (Gas Turbine)	lb/hr	22,327	18,798
4	Exhaust Flow	lb/hr	1,315,800	1,121,040
4	Exhaust Temperature	°F	799	846
5	Dilution Air Flow	lb/hr	90,900	160,100
6	Stack Flow	lb/hr	1,406,700	1,281,140
6	Stack Temperature	°F	750	750

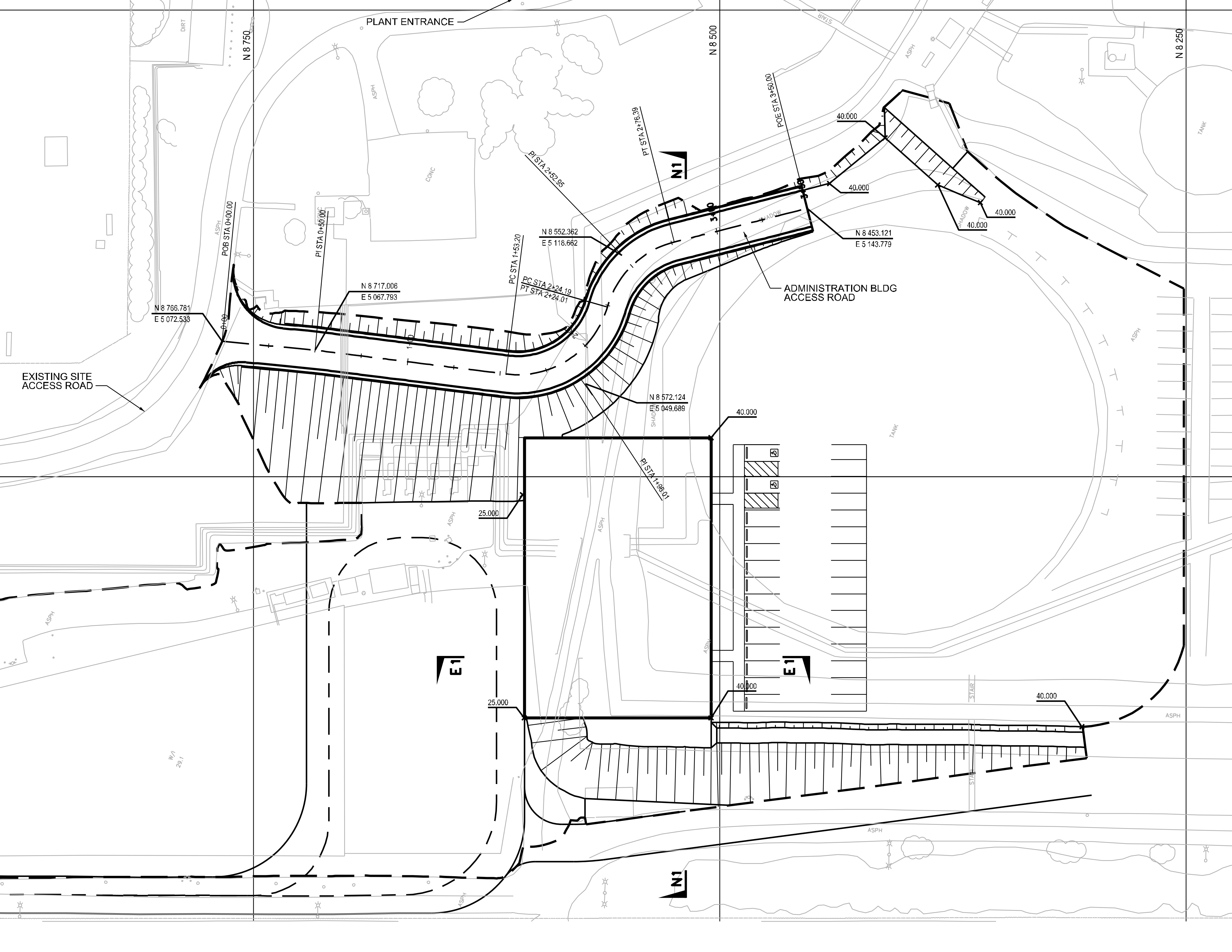




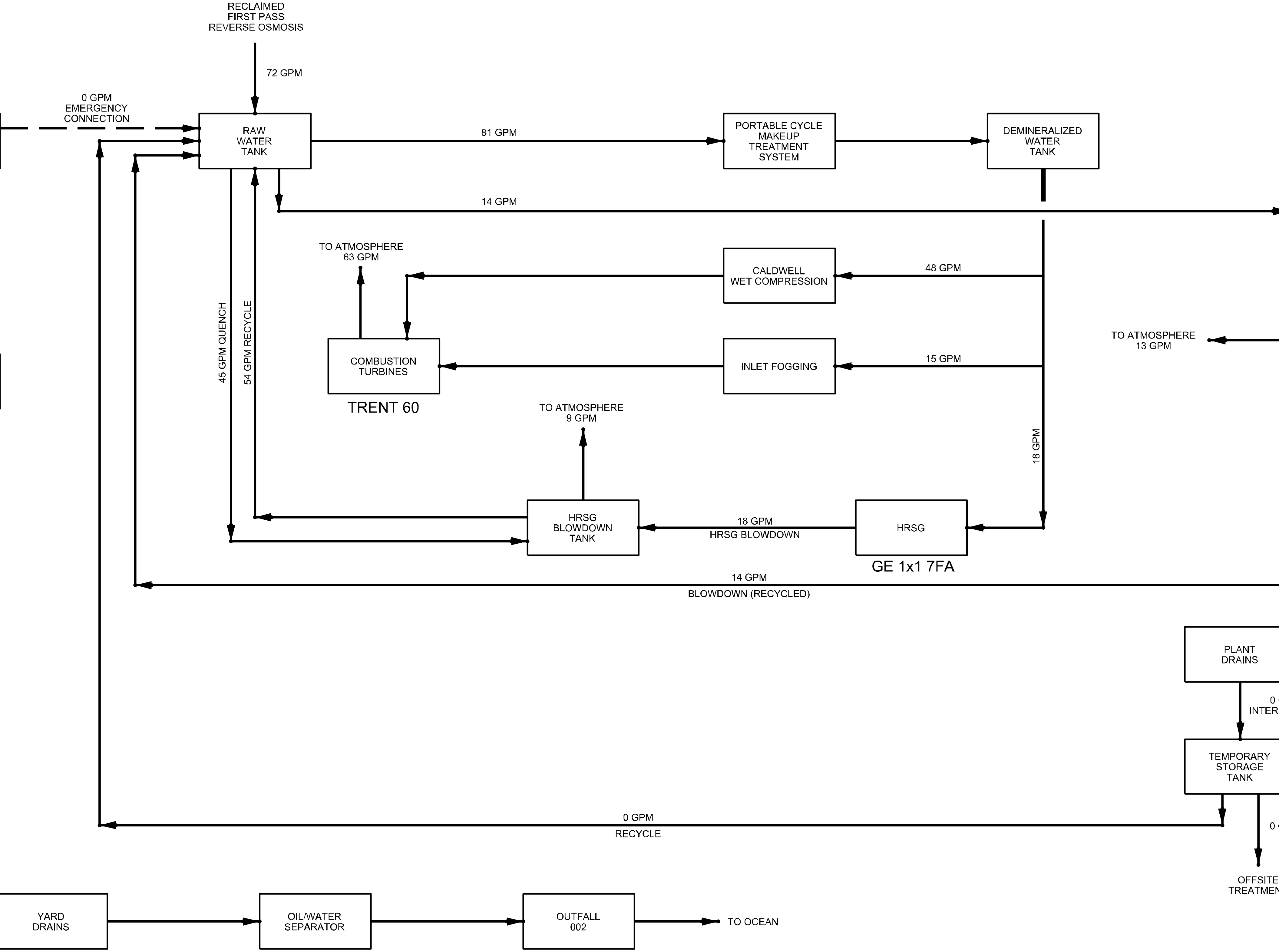
PMENT/PROCESSES
E REMOVED FOR ESEC

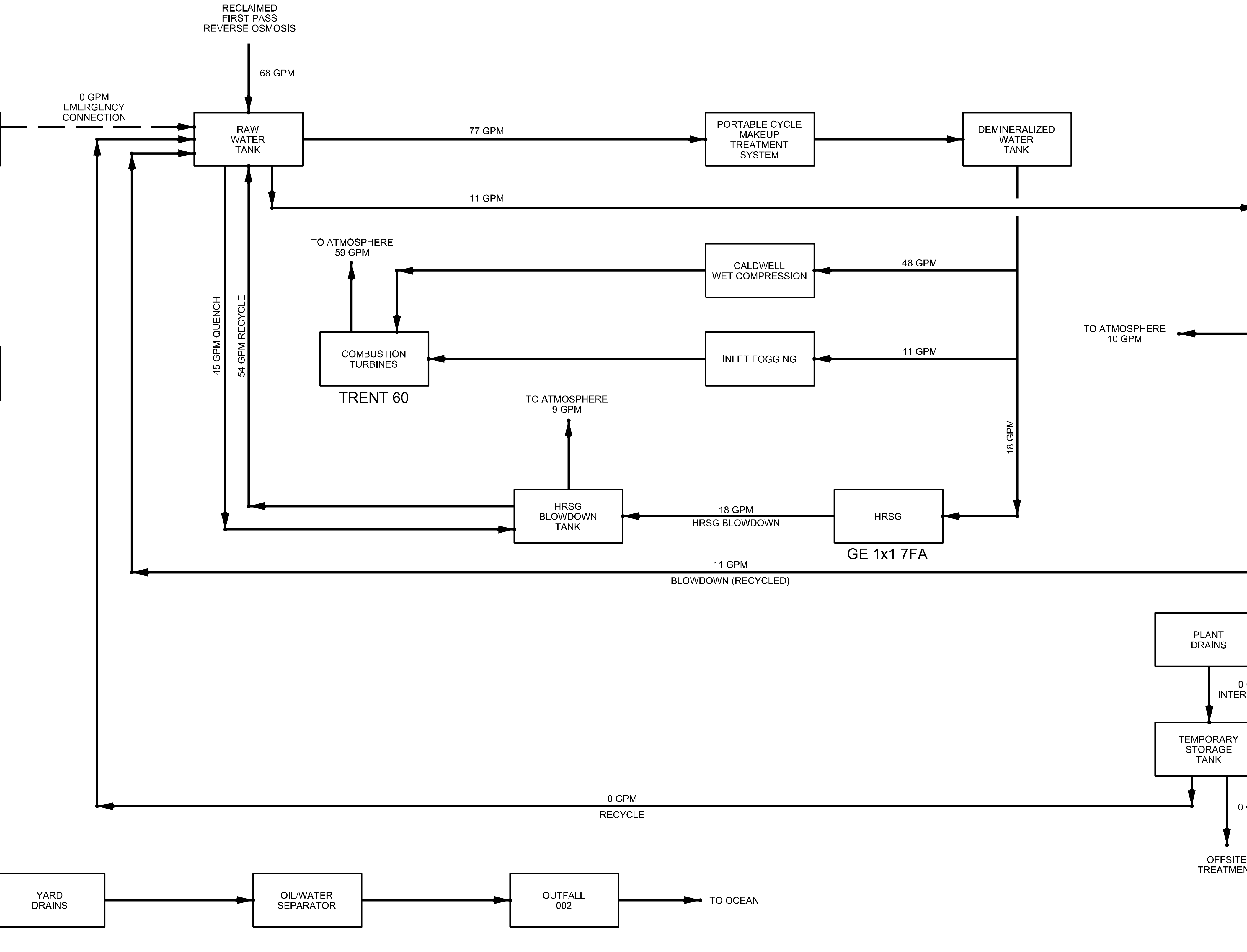
PMENT/PROCESSES
E REMOVED FOR ESPFM

100 50 0
Scale: 1 INC

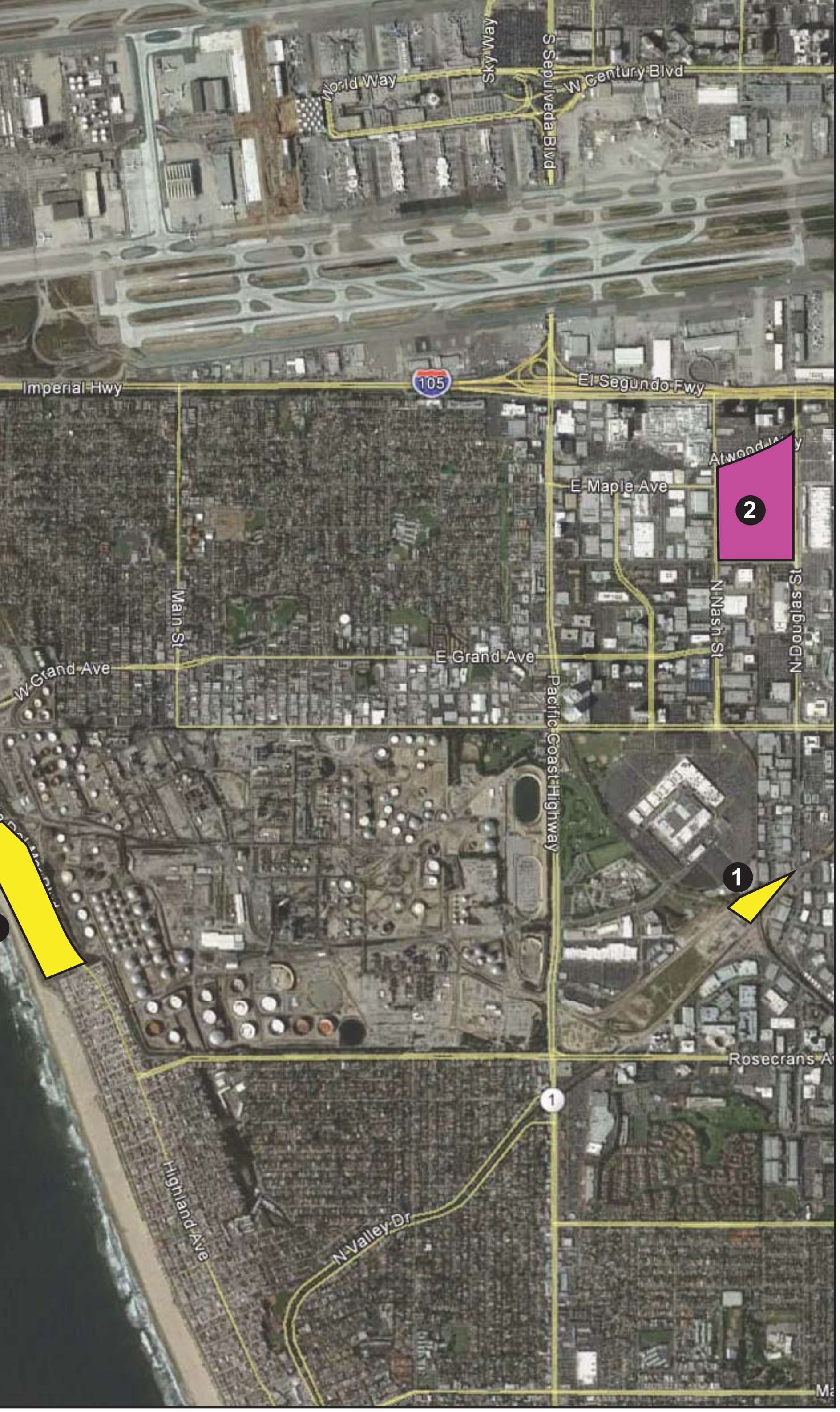


PLANT ENTRANCE
N 8 750
N 8 500
N 8 250
POB STA 0+00.00
PI STA 0+50.00
PC STA 1+53.20
PI STA 2+52.95
PT STA 2+76.39
POE STA 3+50.00
PC STA 2+24.19
PT STA 2+24.01
PI STA 1+96.01
N 8 766.781
E 5 072.533
N 8 717.006
E 5 067.793
N 8 552.362
E 5 118.662
N 8 453.121
E 5 143.779
N 8 572.124
E 5 049.689
ADMINISTRATION BLDG ACCESS ROAD
EXISTING SITE ACCESS ROAD
40.000
25.000
N1
E1
TANK
ASPH
CONC
DIRT
STAIR
SHADOW

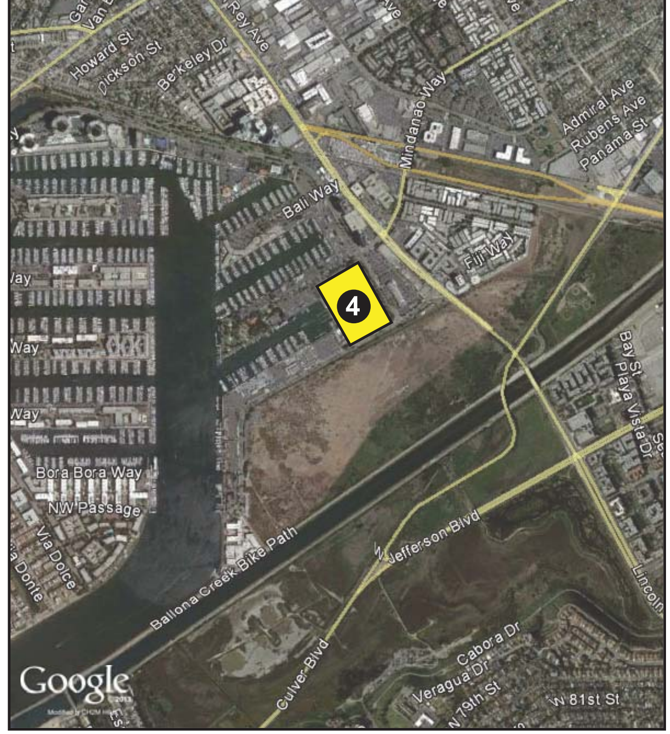

RECLAIMED
FIRST PASS
REVERSE OSMOSIS
72 GPM
0 GPM
EMERGENCY
CONNECTION
RAW
WATER
TANK
81 GPM
PORTABLE CYCLE
MAKEUP
TREATMENT
SYSTEM
DEMINERALIZED
WATER
TANK
14 GPM
TO ATMOSPHERE
63 GPM
CALDWELL
WET COMPRESSION
48 GPM
TO ATMOSPHERE
13 GPM
45 GPM QUENCH
54 GPM RECYCLE
COMBUSTION
TURBINES
INLET FOGGING
15 GPM
TRENT 60
TO ATMOSPHERE
9 GPM
18 GPM
HRSG
BLOWDOWN
TANK
18 GPM
HRSG BLOWDOWN
HRSG
GE 1x1 7FA
14 GPM
BLOWDOWN (RECYCLED)
PLANT
DRAINS
TEMPORARY
STORAGE
TANK
0 GPM
RECYCLE
OFFSITE
YARD
DRAINS
OIL/WATER
SEPARATOR
OUTFALL
002
TO OCEAN



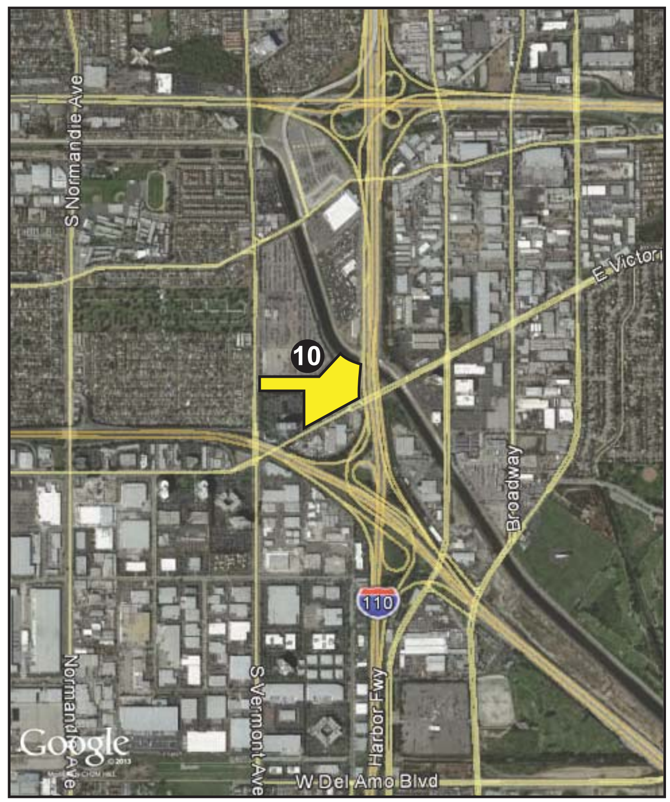
RECLAIMED FIRST PASS REVERSE OSMOSIS
68 GPM
0 GPM EMERGENCY CONNECTION
RAW WATER TANK
77 GPM
PORTABLE CYCLE MAKEUP TREATMENT SYSTEM
DEMINERALIZED WATER TANK
11 GPM
TO ATMOSPHERE 59 GPM
CALDWELL WET COMPRESSION
48 GPM
TO ATMOSPHERE 10 GPM
COMBUSTION TURBINES
TRENT 60
INLET FOGGING
11 GPM
45 GPM QUENCH
54 GPM RECYCLE
TO ATMOSPHERE 9 GPM
18 GPM
HRSG BLOWDOWN TANK
18 GPM
HRSG BLOWDOWN
HRSG
GE 1x1 7FA
11 GPM
BLOWDOWN (RECYCLED)
PLANT DRAINS
TEMPORARY STORAGE TANK
0 GPM
RECYCLE
OFFSITE
YARD DRAINS
OIL/WATER SEPARATOR
OUTFALL 002
TO OCEAN



ough 9 (Excluding 4)



Detail B - Area 4



Detail C - Area 10

Off-Site Laydown and Parking

Approved Laydown and Parking Areas

PTA Removed Laydown and Parking A

Laydown and Parking Areas	PARKIN
1 Kramer	
2 Fedex	●
3 LAX-Pershing	●
4 Marina del Rey Boat Launch	●
5 Dockweiler State Beach	●
6 Hyperion	●
7 Grand Avenue	●
8 Chevron Marine Terminal	
9 Power Plant Site	
10 190th Street	●

FIGURE 2-10

SECTION 3.0

Environmental Analysis

3.1 Air Quality

As discussed in detail in Section 2.0, Project Description, this PTA proposes modifications to the ESEC that necessitate evaluation of environmental impacts and potential amendments to existing COCs. The proposed PTA is for decommissioning, demolishing, and replacing the existing Units 3 and 4 steam boiler plants with approximately 449 MW gross / 435 MW net of new natural-gas-fired electrical generating capacity, consisting of one combined-cycle train and two simple-cycle gas turbines. The air-cooled, combined-cycle train (CC Fast) will consist of a gas turbine generator (GTG, Unit 9), a heat recovery steam generator (HRSG), and one steam turbine generator (STG, Unit 10), rated at 325 MW net / 334 MW gross. The simple cycle turbines (Units 11 and 12) will consist of two air-cooled Trent 60 ISE advanced aeroderivative gas turbines, each rated at 55 MW net / 58 MW gross. The GE turbine will be supported by a small (36 MMBtu/hr) auxiliary boiler that will be incorporated into the operation of the CC Fast. Removal of existing Units 3 and 4 will eliminate the remaining once-through ocean water cooling system at the ESGS site. The ESPFM will improve electricity generation by adding fast-start and dispatch flexibility capability to support southern California grid load balancing. Total site capacity (including the new equipment previously permitted) will not exceed 1,020 MW net—the rated capacity of previously retired Units 1 and 2, plus the capacity of the soon-to-be-retired Unit 3 and operating Unit 4, which will also be retired as part of the ESPFM.

3.1.1 Introduction

ESEC LLC, the project owner, a wholly owned subsidiary of NRG Energy, Inc. proposes to upgrade the existing ESEC by decommissioning, demolishing, and replacing existing steam boiler Units 3 and 4 with approximately 449 MW gross / 435 MW net of natural-gas-fired electrical generating capacity. This project will be described as the El Segundo Power Facility Modification (ESPFM) project.

This section of the PTA describes existing air quality conditions; maximum potential impacts from the project; compliance with applicable LORS; and mitigation measures that keep project impacts below applicable thresholds of significance. The methodology and results of the air quality analysis used to assess potential impacts are also presented. The analysis has been conducted according to the CEC) power plant siting requirements and also addresses SCAQMD air permitting requirements.

The project will use the latest, most efficient generation technology to generate electricity in a manner that will minimize the amount of fuel needed, emissions of criteria pollutants, and potential effects on ambient air quality.

Other beneficial environmental aspects of the project that minimize adverse air quality impacts include the following:

- Clean-burning natural gas as fuel;
- SCR and combustion controls (dry low-NOx/dry low emissions [DLN/DLE] combustion) to reduce oxides of nitrogen (NOx) emissions;
- Oxidation catalysts to reduce emissions of carbon monoxide (CO) and hazardous air pollutants; and
- Appropriately sized stacks to reduce ground-level concentrations of exhaust constituents.

Details of the air quality assessment of the project are contained in the following subsections:

- Section 3.1.2, Affected Environment, describes the local environment surrounding the project site, including topography, climate, and existing air quality. The most representative meteorological data—including wind speed and direction, temperature, relative humidity, and precipitation—and the most representative recent ambient concentration measurements for criteria air pollutants are summarized.

- Section 3.1.3, Laws, Ordinances, Regulations, and Standards, describes applicable LORS pertaining to air quality aspects of the project.
- Section 3.1.4, Environmental Consequences, evaluates the maximum potential air quality impacts due to the project's emissions of NOx, CO, sulfur oxides (SOx), volatile organic compounds (VOC), particulate matter less than 10 microns in diameter (PM_{10}), and particulate matter less than 2.5 microns in diameter ($PM_{2.5}$). Emission estimates for these pollutants are presented for the construction phase of the project, as well as for operation of the installed equipment over a full range of operating modes, including commissioning, startups and shutdowns, maintenance activities, and normal operation with operable pollution control systems. A dispersion modeling analysis for nitrogen dioxide (NO_2), CO, sulfur dioxide (SO_2), PM_{10}, and $PM_{2.5}$ is presented; the results show that the project would not cause or significantly contribute to exceedances of the California Ambient Air Quality Standards (CAAQS) or National Ambient Air Quality Standards (NAAQS). Emissions of greenhouse gases (GHG) from the project are also described.
- Section 3.1.5, Cumulative Air Quality Impacts, addresses the cumulative impacts of the project emissions with other potential new sources of air pollution in the area around the ESGS site.
- Section 3.1.6, Consistency with Laws, Ordinances, Regulations, and Standards, describes how the project will comply with applicable LORS pertaining to air quality aspects of the project. This section also provides an analysis of BACT for the proposed project and explains how the use of water injection with SCR and ammonia injection satisfies the SCAQMD NOx requirements for BACT for the turbines and how the use of an oxidation catalyst meets the corresponding CO BACT requirements.
- Section 3.1.7, Mitigation Measures, describes the project emission offsets strategy, including emission reduction credits (ERC) that are proposed to offset project emissions.
- Section 3.1.8, Permits Required and Permit Schedule, lists the air quality permits required for the project and provides a permit schedule for the project.
- Section 3.1.9, References, lists the references used to conduct the air quality assessment.

Some air quality data are presented in other sections of this PTA, including an evaluation of toxic air pollutants (see Section 3.8, Public Health) and information relating to the fuel characteristics, heat rate, and startup and operating limits of the project equipment (see Section 2.0, Project Description).

The District has required use of meteorological and ambient data for the period 2007 through 2009 for the purposes of this analysis, and has provided the data in files used to conduct the modeling. All results in this section are based on background data from that time period. The supplemental analysis in support of the Prevention of Significant Deterioration (PSD) application will be submitted at a later date, after receipt of additional data from the District, and will be based on the 5-year period from 2004 through 2008.

3.1.2 Affected Environment

This section describes the regional climate and meteorological conditions that influence the transport and dispersion of air pollutants, as well as the existing air quality within the project region. The data presented in this section are representative of the project site.

The ESEC project includes two 1x1 fast start air-cooled combined-cycle trains (Units 5 through 8)—and existing 670 MW natural-gas-fueled steam boiler Units 3 and 4 located on the ESGS site in El Segundo, California. Figures 1-1 and 1-2 show the project vicinity and site. The project site is at the southernmost city limit of the city of El Segundo on the coast of the Pacific Ocean between Dockweiler State Beach and the city of Manhattan Beach. The site address is 301 Vista Del Mar, El Segundo, approximately 2 miles south of the Los Angeles International Airport (LAX). It is located less than a 0.25 mile south of the Los Angeles Department of Water and Power's Scattergood Generating Station and 0.5 mile south of the City of Los Angeles' Hyperion Wastewater Treatment Plant. The Chevron El Segundo refinery is located across Vista Del Mar from the project site. The city of Manhattan Beach is immediately to the south.

3.1.2.1 Geography and Topography

The project is located in the coastal region of the South Coast basin, in the city of El Segundo in Los Angeles County. The site elevation is approximately 15 feet above sea level and the site is located directly on the coast, bordered by the Pacific Ocean, the coastline, and a portion of urban Los Angeles. The coastline runs north-northwest to south-southeast along the project boundary. Small bluffs (approximately 100 feet high) run north to south just east of the project boundary, with elevated terrain a significant distance from the project site (approximately 6 miles).

3.1.2.2 Meteorology and Climate

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

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

The nearest full-time meteorological monitoring station to the proposed project site is maintained by the SCAQMD and is located at LAX, approximately 2.5 miles northeast of the project site. Based on 5 years of data collection in 2007–2011, annual maximum ambient temperatures recorded at LAX range from 93 degrees Fahrenheit (°F) to 103°F. The South Coast basin receives most of its rainfall between November and April. LAX recorded an annual average of 12 inches during this period. The wind patterns near the project site are predominately from the west or northwest (approximately 30%). Calm conditions prevail from 10% to approximately 16% of the time. The mixing heights recorded at LAX in the morning range from 335 meters (1,100 feet) to greater than 1,000 meters (3,050 feet). The mixing heights recorded at LAX in the afternoon range from 510 meters (1,670 feet) to 1,200 meters (3,940 feet).

The nearest long-term meteorological station with available temperature and precipitation means and extremes is a National Weather Service Cooperative Network (COOP) station in Los Angeles County at LAX. The ESPFM project is located approximately 2.5 miles to the southwest of LAX weather station located at latitude 33°56.3’N, longitude 118°24.0’W. Data collected at this station over a 30-year period (1971–2000) are presented in Table 3.1-1. The hottest month, August, has an average maximum temperature of 76.7°F and an average minimum temperature of 64.5°F. The coldest month, January, has an average maximum temperature of 65.6°F and an average minimum temperature of 48.7°F.

TABLE 3.1-1
Average Temperatures and Precipitation at Los Angeles Airport, Los Angeles County (1971-2000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Average Maximum Temperature (°F)	65.6	65.7	65.8	67.8	69.4	72.5	75.4	76.7	76.4	74.3	68	66.8	70.6
Average Minimum Temperature (°F)	48.7	50.1	51.4	53.7	56.9	60.1	63.3	64.5	63.4	59.3	51.2	48.6	56.1
Precipitation (inches)	2.94	3.14	2.14	0.75	0.25	0.08	0.03	0.16	0.21	0.44	1.17	1.96	13.25

Source: Western Regional Climate Center (http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?calosa)

3.1.2.3 Overview of Air Quality Standards

The U.S. Environmental Protection Agency (EPA) has established NAAQS for ozone (O_3), NO_2, CO, SO_2, PM_{10}, $PM_{2.5}$, and airborne lead. Areas with ambient levels above these standards are designated by EPA as “nonattainment areas” subject to planning and pollution control requirements that are more stringent than standard requirements.

The California Air Resources Board (CARB) has established California ambient air quality standards for ozone, CO, NO_2, SO_2, sulfates, PM_{10}, $PM_{2.5}$, airborne lead, hydrogen sulfide, and vinyl chloride at levels designed to protect the most sensitive members of the population, particularly children, the elderly, and people who suffer from lung or heart diseases.

Both state and national air quality standards consist of two parts: an allowable concentration of a pollutant, and an averaging time over which the concentration is to be measured. Allowable concentrations are based on the results of studies of the effects of the pollutants on human health, crops and vegetation, and, in some cases, damage to paint and other materials. The averaging times are based on whether the damage caused by the pollutant is more likely to occur during exposures to a high concentration for a short time (one hour, for instance), or to a relatively lower average concentration over a longer period (8 hours, 24 hours, or 1 month). For some pollutants there is more than one air quality standard, reflecting both short-term and long-term effects. Table 3.1-2 presents the NAAQS and California ambient air quality standards for selected pollutants. The California standards are generally set at concentrations lower than the federal standards and, in some cases, have shorter averaging periods.

3.1.2.4 Existing Air Quality

All ambient air quality data presented in this section were published by CARB on the ADAM website and/or by EPA on the AIRS data website. Ambient air concentrations of O_3, NO_2, SO_2, CO, PM_{10}, and $PM_{2.5}$ are recorded at monitoring stations throughout Los Angeles County. The project site is located in the coastal region of the South Coast basin, bordered by the Pacific Ocean, the coastline, and a portion of urban Los Angeles. The area surrounding to the north and east of the facility is heavily industrial; the ocean lies to the west. The closest residences are a group of residences to the south, located approximately 0.4 km from the project.

The closest air quality monitoring station to the project site is located in LAX approximately 2.5 miles northeast of the site. Therefore, data from the LAX monitoring station were used to represent background air pollutant concentrations for the vicinity of the project. Following District instructions, background data for the 2007 to 2009 time period were selected for the air modeling analysis for the ESPFM, although ten years of background data are presented below to characterize the existing conditions at the project site.

Ambient concentrations of O_3, NO_2, SO_2, CO, and PM_{10} are recorded at the LAX monitoring station located at 7201 W. Westchester Parkway, approximately 2.5 miles northeast of the project site. The closest station that monitors ambient $PM_{2.5}$ is at the North Long Beach monitoring station (located at 3648 N. Long Beach Blvd), approximately 15 miles southeast of the project site.

Ozone (O_3). Ozone is not directly emitted from stationary or mobile sources, but is an end-product of complex reactions between VOC and NOx in the presence of ultraviolet solar radiation. VOC and NOx emissions from vehicles and stationary sources—combined with daytime wind flow patterns, mountain barriers, temperature inversions, and intense sunlight—generally result in the highest O_3 concentrations. For purposes of both state and federal air quality planning, the South Coast air basin is classified as a nonattainment area with respect to both state and national ambient standards for ozone. Table 3.1-3 shows the measured ozone levels at the LAX station during the period from 2002 to 2011. The 1 hour ozone CAAQS of 0.09 parts per million (ppm) was exceeded four times during the ten-year analysis period; it has not been exceeded at this monitoring station since 2004.

TABLE 3.1-2
National and California Ambient Air Quality Standards

		California Standards		Federal Standards		
Pollutant	**Averaging Time**	**Concentration**	**Method**	**Primary**	**Secondary**	**Method**
Ozone	1 Hour	0.09 ppm (180 µg/m^3)	Ultraviolet Photometry	—	Same as Primary Standard	Ultraviolet Photometry
	8 Hour	0.07 ppm (137 µg/m^3)		0.075 ppm (147 µg/m^3)		
Respirable Particulate Matter (PM_{10})	24 Hour	50 µg/m^3	Gravimetric or Beta Attenuation	150 µg/m^3	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	20 µg/m^3		—		
Fine Particulate Matter ($PM_{2.5}$)	24 Hour	No Separate State Standard		35 µg/m^3 [a]	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	12 µg/m^3	Gravimetric or Beta Attenuation	12.0 µg/m^3		
Carbon Monoxide (CO)	1 Hour	20 ppm (23 mg/m^3)	Non-Dispersive Infrared Photometry (NDIR)	35 ppm (40 mg/m^3)	None	Non-Dispersive Infrared Photometry (NDIR)
	8 Hour	9.0 ppm (10 mg/m^3)		9 ppm (10 mg/m^3)		
Nitrogen Dioxide (NO_2)	1 hour	0.18 ppm (339 µg/m^3)	Gas Phase Chemi-luminescence	100 ppb[b] (188 µg/m^3)	Same as Primary Standard	Gas Phase Chemiluminescence
	Annual Arithmetic Mean	0.030 ppm (57 µg/m^3)		0.053 ppm (100 µg/m^3)	None	
Sulfur Dioxide (SO_2)	1 Hour	0.25 ppm (655 µg/m^3)	Ultraviolet Fluorescence	75 ppb[c] (196 µg/m^3)	—	Ultraviolet Fluorescence Spectrophotometry (Parasaniline Method)
	3 Hour	—		—	0.5 ppm (1300 µg/m^3)	
	24 Hour	0.04 ppm (105 µg/m^3)		—	—	
Lead	30 Day Average	1.5 µg/m^3	Atomic Absorption	—	—	—
	Calendar Quarter	—		1.5 µg/m^3	Same as Primary Standard	High Volume Sampler and Atomic Absorption
	Rolling 3-Month Average	—		0.15 µg/m^3		
Visibility Reducing Particles	8 Hour	Extinction Coefficient of 0.23 per kilometer—visibility of 10 miles or more due to particles when relative humidity is less than 70 percent. Method: Beta Attenuation and Transmittance through Filter Tape.		No Federal Standards		
Sulfates	24 Hour	25 µg/m^3	Ion Chromatography			
Hydrogen Sulfide	1 Hour	0.03 ppm (42 µg/m^3)	Ultraviolet Fluorescence			
Vinyl Chloride	24 Hour	0.01 ppm (26 µg/m^3)	Gas Chromatography			

[a]To attain this standard, the 3-year average of the 98th percentile of the daily concentrations must not exceed 35 µg/m^3.
[b]To attain this standard, the 3-year average of the 98th percentile of the daily maximum 1-hour average must not exceed 100 ppb.
[c]To attain this standard, the 3-year average of the 99th percentiles of the daily maximum 1-hour average must not exceed 75 ppb.

Source: California Air Resources Board (6/7/12)

The federal 8-hour O_3e NAAQS requires that the 3-year average of the fourth-highest values for individual years be maintained at or below 0.075 ppm. Therefore, the number of days in each year with maximum 8-hour concentrations above the standard in Table 3.1-3 does not equate to the number of violations. There have been no violations of state or federal ozone standards at this station since 2008.

O_3 data completeness at the LAX station averaged 94 percent over the period of 2004 to 2011.

TABLE 3.1-3
Ozone Levels at LAX Station, Los Angeles Westchester Parkway (ppm)

Los Angeles Westchester Parkway Station, Los Angeles County	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Maximum 1-hour Average	—	—	0.120	0.086	0.084	0.087	0.086	0.077	0.089	0.078
Number of Days Exceeding California 1-hour Standard (0.09 ppm)	—	—	4	0	0	0	0	0	0	0
Number of Days Exceeding Old National 1-hour Standard (0.12 ppm)[1]	—	—	0	0	0	0	0	0	0	0
Maximum 8-hour Average	—	—	0.100	0.076	0.067	0.076	0.076	0.070	0.070	0.067
Number of Days Exceeding California 8-hour Standard (0.07 ppm)	—	—	17	2	0	1	1	0	0	0
Number of Days Exceeding National 8-hour Standard (0.075 ppm)[2]	—	—	11	1	0	0	0	0	0	0

Note: The Los Angeles Westchester Parkway Monitoring Station started operation in 2004. Measurements are not available for 2002 and 2003.

[a]EPA revoked the 1-hour ozone standard in all areas on June 15, 2005.

[b]To attain this standard, the 3-year average of the fourth-highest maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.075 ppm. (Effective May 27, 2008).

Source: CARB ADAM Website (www.arb.ca.gov/adam/welcome.html).

Nitrogen Dioxide (NO_2). NO_2 is formed primarily from reactions in the atmosphere between NO (nitric oxide) and oxygen (O_2) or ozone. NO is formed during high-temperature combustion processes, when the nitrogen and oxygen in the combustion air combine. Although NO is much less harmful than NO_2, it can be converted to NO_2 in the atmosphere within a matter of hours, or even minutes, under certain conditions. The control of NO and NO_2 emissions is also important because of the role of both compounds in the atmospheric formation of O_3.

Table 3.1-4 shows NO_2 levels recorded at the LAX station for the years 2002 through 2011.

The South Coast air basin is classified as a nonattainment area with respect to state ambient NO_2 standards but is in attainment with regard to the national ambient standards. During the period from 2004 to 2011, there were no violations of the CAAQS 1-hour standard (0.18 ppm) at the monitoring station in Los Angeles County. The highest 1-hour concentration recorded at the LAX station during the years 2004 to 2011 was 0.099 ppm in 2006. A new federal 1-hour NO_2 standard of 0.100 ppm became effective on April 12, 2010. To attain this standard, the 3-year average of the 98th percentile of the daily maximum 1-hour average at each monitor within South Coast air basin must not exceed 0.100 ppm. Table 3.1-4 also shows that there were no violations of the annual NAAQS (0.053 ppm) or annual CAAQS (0.030 ppm) at the LAX station during this period.

Data completeness for NO_2 concentrations at the LAX station averaged 87 percent for the 2004 through 2011 period.

TABLE 3.1-4
Nitrogen Dioxide Levels at LAX Station, Los Angeles Westchester Parkway (ppm)

Los Angeles Westchester Parkway Station, Los Angeles County	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Maximum 1-hour Average	—	—	0.091	0.091	0.099	0.084	0.094	0.077	0.076	0.098
Annual Average	—	—	[a]	0.013	0.015	0.014	0.014	[a]	0.012	0.013
Days Over State Standard (0.18 ppm, 1-hour)	—	—	0	0	0	0	0	0	0	0
Days Over Federal Standard (0.100 ppm, 1 hour)[b]	—	—	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0

Note: The Los Angeles Westchester Parkway Monitoring Station started operation in 2004. Measurements are not available for 2002 and 2003.

[a]There were insufficient (or no) data available to determine the value.

[b]The new federal 1-hour average NO_2 standard of 0.100 ppm was announced by EPA on February 9, 2010 and became effective April 12, 2010. To attain this standard, the 3-year average of the 98th percentile of the daily maximum 1-hour average values at each monitor must not exceed 100 ppb.

N/A = not applicable

Source: CARB ADAM Website (www.arb.ca.gov/adam/welcome.html).

Carbon Monoxide (CO). Carbon monoxide is a product of incomplete combustion and is emitted principally from automobiles and other mobile sources of pollution. It is also a product of combustion from stationary sources (both industrial and residential) burning fuels. Peak CO levels occur typically during winter months due to a combination of higher emission rates and stagnant weather conditions.

Table 3.1-5 shows the available data on maximum 1-hour and 8-hour average CO levels recorded at the LAX station during the period from 2002 to 2011. As indicated by this table, the maximum measured 1-hour average CO levels comply with the NAAQS and CAAQS (35.0 ppm and 20.0 ppm, respectively) and the maximum 8-hour values comply with the NAAQS and CAAQS of 9.0 ppm. The highest individual 1-hour and 8-hour CO concentrations at this station during the period from 2004 to 2011 were 3.7 ppm and 3.03 ppm, respectively, both recorded in 2004. For purposes of both state and federal air quality planning, the South Coast air basin is in attainment with regard to CO.

Data completeness for CO concentrations at the LAX station averaged 91 percent over this period.

TABLE 3.1-5
Carbon Monoxide Levels at LAX Station, Los Angeles Westchester Parkway (ppm)

Los Angeles Westchester Parkway Station, Los Angeles County	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Maximum 1-hour Average	—	—	3.7	2.8	2.8	3.3	*	2.6	2.6	2.3
Maximum 8-hour Average	—	—	3.03	2.14	2.27	2.39	2.53	1.99	2.19	1.79
Days Over the 8-hour California Standard (9 ppm)	—	—	0	0	0	0	0	0	0	0
Days Over the 8-hour Federal Standard (9 ppm)	—	—	0	0	0	0	0	0	0	0

*There were insufficient (or no) data available to determine the value.

Sources: CARB ADAM Website (www.arb.ca.gov/adam/welcome.html); EPA AIRS Website (www.epa.gov/air/data/index.html)

Sulfur Dioxide (SO_2). SO_2 is produced by the combustion of any sulfur-containing fuel. It is also emitted by chemical plants that treat or refine sulfur or sulfur-containing chemicals. Natural gas contains nearly negligible sulfur, whereas fuel oils may contain much larger amounts. Because of the complexity of the chemical reactions that convert SO_2 to other compounds (such as sulfates), peak concentrations of SO_2 occur at different times of the year in different parts of California, depending on local fuel characteristics, weather, and topography. The South Coast air basin is considered to be in attainment for SO_2 for purposes of state and federal air quality planning.

Table 3.1-6 shows the available data on maximum 1-hour, 24-hour, and annual average SO_2 levels recorded at the LAX station during the period from 2002 to 2011. As indicated by this table, the maximum measured 1-hour average SO_2 levels comply with the new NAAQS (75 ppb) and CAAQS (0.25 ppm), and the maximum 24-hour values comply with the NAAQS and CAAQS of 0.14 ppm and 0.04 ppm, respectively. The table also demonstrates compliance with the annual SO_2 NAAQS of 0.03 ppm. Note that the 24-hour and annual NAAQS for SO_2 have been superseded by the new 1-hour NAAQS, which became effective on August 23, 2010. SO_2 data completeness at the LAX station averaged 88 percent over the period of 2004 to 2011.

TABLE 3.1-6
Sulfur Dioxide Levels at LAX Station, Los Angeles Westchester Parkway (ppm)

Los Angeles Westchester Parkway Station, Los Angeles County	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Highest 1-hour average	—	—	0.024	0.040	0.021	0.019	0.021	0.022	0.026	0.012
Highest 24-hour average	—	—	0.007	0.012	0.010	0.009	0.005	0.006	0.004	0.002
Annual Average	—	—	[a]	0.005	0.002	0.002	0.001	[a]	0	0
Days Over 1-hour State Standard (0.25 ppm)	—	—	0	0	0	0	0	0	0	0
Days Over 1-hour Federal Standard (75 ppb)[b]	—	—	0	0	0	0	0	0	0	0
Days Over 24-hour State Standard (0.04 ppm)	—	—	0	0	0	0	0	0	0	0

Note: The Los Angeles Westchester Parkway Monitoring Station started operation in 2004. Measurements are not available for 2002 and 2003.

[a]There were insufficient (or no) data available to determine the value.

[b]Final rule signed June 22, 2010, effective August 23, 2010. To attain this standard, the 3-year average of the 99th percentile of the daily maximum 1-hour average at each monitor within an area must not exceed 75 ppb.

Sources: CARB ADAM Website (www.arb.ca.gov/adam/welcome.html); EPA AIRS Website (www.epa.gov/air/data/index.html)

Respirable Particulate Matter (PM_{10}). Particulates in the air are caused by a combination of wind-blown fugitive dust; particles emitted from combustion sources and manufacturing processes; and organic, sulfate, and nitrate aerosols formed in the air from emitted hydrocarbons, sulfur oxides, and nitrogen oxides. Particulates with a diameter less than or equal to 10 microns are referred to as PM_{10}, and are regulated because they can be inhaled, leading to health effects. Fine particulates, referred to as $PM_{2.5}$ and having a diameter equal to or less than 2.5 microns, are a subset of PM_{10} that are also regulated. $PM_{2.5}$ standards are discussed later in this section.

Table 3.1-7 shows the maximum PM_{10} levels recorded at the LAX monitoring station during the period from 2002 through 2011 and the arithmetic annual average concentrations for the same period. (The arithmetic annual average is simply the arithmetic mean of the daily observations.) PM_{10} is monitored according to different protocols for evaluating compliance with the state and federal standards for this pollutant. Specifically, California uses a gravimetric or beta attenuation method, whereas compliance with federal standards is evaluated based on an inertial separation and gravimetric analysis. This accounts for the slightly differing 24-hour concentrations listed in Table 3.1-7 that represent data obtained by means of the state and federal samplers.

At the LAX station, the maximum 24-hour PM_{10} levels exceed the CAAQS state standard of 50 micrograms per cubic meter (µg/m^3) a few times per year. The maximum daily concentration recorded during the analysis period was 128 µg/m^3 (both state and federal samplers) in 2007. The maximum annual arithmetic mean concentration recorded at LAX was 29.3 µg/m^3, also in 2007, which is above the state standard of 20 µg/m^3. The federal annual PM^{10} standard was revoked by the EPA in 2006. South Coast Air Basin attainment status for both the state and federal PM_{10} standards are "nonattainment."

PM_{10} concentration data completeness at the LAX station averaged 87 percent for the period of 2004 to 2011.

TABLE 3.1-7
Particulate Matter (PM_{10}) Levels at LAX Station, Los Angeles Westchester Parkway (µg/m^3)

Los Angeles Westchester Parkway Station, Los Angeles County	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Maximum 24-hour Average (federal testing samplers)	—	—	47.0	44.0	45.0	128.0	50.0	52.0	37.0	41.0
Maximum 24-hour Average (state testing samplers)	—	—	46.0	44.0	45.0	128.0	50.0	52.0	37.0	41.0
Annual Arithmetic Mean[a]	—	—	21.5	22.9	23.5	29.3	25.6	25.6	20.6	21.7
Estimated Number of Days Exceeding Federal Standard (150 µg/m^3)	—	—	[b]	[b]	[b]	[b]	0	0	0	0
Estimated Number of Days Exceeding State Standard (50 µg/m^3)	—	—	[b]	[b]	0	[b]	0	6.5	[b]	0

Note: The Los Angeles Westchester Parkway Monitoring Station started operation in 2004. Measurements are not available for 2002 and 2003.

[a]On December 17, 2006, the annual PM_{10} federal standard (50 µg/m^3) was revoked.

[b]There were insufficient (or no) data available to determine the value.

Source: CARB ADAM Website (www.arb.ca.gov/adam/welcome.html).

Fine Particulates ($PM_{2.5}$). Fine particulates result from fuel combustion in motor vehicles and industrial processes, residential and agricultural burning, and atmospheric reactions involving NOx, SOx, and organics. Fine particulates are referred to as $PM_{2.5}$ and have a diameter equal to or less than 2.5 microns. In 1997, EPA established annual and 24-hour NAAQS for $PM_{2.5}$ for the first time. The most recent revision to the standard regulating the 3-year average of the 98th percentile of 24-hour $PM_{2.5}$ concentrations (35 µg/m^3) became effective on December 17, 2006.

The $PM_{2.5}$ data in Table 3.1-8 show that the national 24-hour average NAAQS of 35 µg/m^3 was exceeded 20 to 35 times per year during the 2002 and 2003 calendar years. The number and severity of exceedances of the NAAQS were reduced greatly from 2008 to 2011; in 2011, there were only two exceedances of the NAAQS. The maximum recorded 24-hour average value was 48 µg/m^3 in 2003. The annual $PM_{2.5}$ data are also presented in this table. The maximum annual arithmetic mean was 19.5µg/m^3, recorded in 2002, which is above both the national standard of 12.0 µg/$m^3$and the California standard of 12 µg/m^3. Annual average $PM_{2.5}$ concentrations have been below both state and federal standards since 2009. South Coast Air Basin attainment status for the state and federal $PM_{2.5}$ standards is "nonattainment."

TABLE 3.1-8
Particulate Matter (PM2.5) Levels at North Long Beach (µg/m^3)

North Long Beach Station, Los Angeles County	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
24-hour Average (federal only)[a 1]	54	48	46	45	41	39	38	38	33	30
Annual Arithmetic Mean	19.5	18	17.9	15.9	14.1	14.6	14.1	12.8	10.4	11.3
Estimated Number of Days Exceeding Federal Standard (35 µg/m^3)	34.2	24.8	[b]	[b]	[b]	13.7	8.2	6	0	2

[a]EPA lowered the 24-hour standard from 65 µg/m3 to 35 µg/m3 on December 17, 2006. Compliance with this standard is based on the 3-year average of the 98th percentile daily concentrations.

[b]There were insufficient (or no) data available to determine the value.

Source: CARB ADAM Website (www.arb.ca.gov/adam/welcome.html).

Airborne Lead (Pb). Lead pollution has historically been emitted predominantly from the combustion of fuels. However, legislation in the early 1970s required a gradual reduction of the lead content of gasoline. Beginning with the introduction of unleaded gasoline in 1975, lead levels have been dramatically reduced throughout the U.S., and violations of the ambient standards for this pollutant have been virtually eliminated.

On October 15, 2008, EPA revised the federal ambient air quality standard for lead, lowering it from 1.5 µg/m^3 to 0.15 µg/m^3 for both the primary and the secondary standard. EPA determined that numerous health studies are now available that demonstrate health effects at much lower levels of lead than previously thought. EPA subsequently published the final rule in the Federal Register on November 12, 2008. This is the first time that the federal lead standard has been revised since it was first issued in 1978.

In addition to revising the level of the standard, EPA changed the averaging time from a quarterly average to a rolling three-month average. The level of the standard is “not to be exceeded” and is evaluated over a three-year period. Lead levels are measured as lead in total suspended particulate (TSP). The revised lead standard also includes new monitoring requirements.

As lead concentrations dropped dramatically and all areas of California attained the previous standard, most lead monitors were shut down by the early 1990s and resources deployed to other pollutants. As a result, insufficient monitoring data exist to determine designations, and most areas of the state are unclassifiable for the revised standard. Los Angeles County is the only county in the state that is nonattainment for lead ambient air quality standards, and it is nonattainment for both. The designation is not due to SCAQMD’s regional network lead monitors, but instead was based on source-oriented monitors near specific facilities.[1] SCAQMD has been collecting lead data at Los Angeles North Main Street Station since 1989.

The annual lead data are presented in Table 3.1-9. The annual mean was 0.022 µg/m^3 (22.2 ng/m^3), recorded in 2002. The maximum recorded lead value was 0.22 µg/m^3 (220 ng/m^3) in 2010, which is above both the national standard of 0.15 µg/m^3. The attainment status for the federal lead standards is “nonattainment” for the Los Angeles County portion of the South Coast Air Basin.

[1] SCAQMD, *Revised Draft 2012 Lead State Implementation Plan Los Angeles County* (May 4, 2012), p. ES-3.

TABLE 3.1-9
Lead Levels at Los Angeles North Main Street Station (ng/m^3)

North Main Street Station, Los Angeles County	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Annual Mean[a]	22.2	[b]	[b]	[b]	[b]	[b]	[b]	12.2	[b]	[b]
Annual Maximum	48	34	[b]	[b]	[b]	43	[b]	32	220	15
Number of Observations	29	5	0	0	0	18	0	30	12	12

[a]Means of monthly means. Means of monthly means are calculated by first determining the average of all measurements taken within a month at each site. Site means are then calculated by finding the average of the 12 monthly means for each site.

[b]There were insufficient (or no) data available to determine the value.

Source: CARB ADAM Website (www.arb.ca.gov/adam/welcome.html).

Particulate Sulfates. Sulfate compounds found in the lower atmosphere consist of both primary and secondary particles. Primary sulfate particles are directly emitted from open pit mines, dry lakebeds, and desert soils. Fuel combustion is another source of sulfates, both primary and secondary. Secondary sulfate particles are produced when oxides of sulfur (SOx) emissions are transformed into particles through physical and chemical processes in the atmosphere. Particles can be transported long distances. The South Coast Air Basin is in attainment with respect to the state ambient standard for sulfates; there is no federal standard.

Other State-designated Criteria Pollutants. Along with sulfates, California has designated hydrogen sulfide and visibility-reducing particles as criteria pollutants, in addition to the federal criteria pollutants. The South Coast Air Basin remains unclassified for both pollutants.

3.1.3 LORS Compliance

A summary of the applicable air quality LORS for the amended project is provided below. The analysis presented in Section 3.1.6 demonstrates that the amended project would comply with the LORS.

3.1.3.1 Federal LORS

The EPA implements and enforces the requirements of many of the federal environmental laws. The federal Clean Air Act, as most recently amended in 1990, provides EPA with the legal authority to regulate air pollution from stationary sources such as the project. EPA has promulgated the following stationary source regulatory programs to implement the requirements of the 1990 Clean Air Act:

- Prevention of Significant Deterioration (PSD);
- Nonattainment New Source Review (NANSR);
- Standards of Performance for New Stationary Sources (NSPS);
- National Emission Standards for Hazardous Air Pollutants (NESHAPS);
- Title IV: Acid Deposition Control; and
- Title V: Operating Permits.

3.1.3.1.1 Prevention of Significant Deterioration Program

Authority: Clean Air Act §160-169A, 42 USC §7470-7491; 40 CFR Parts 51 and 52

Requirements: Requires pre-construction review and permitting of new or modified major stationary sources of air pollution to prevent significant deterioration of ambient air quality. PSD applies to pollutants for which ambient concentrations do not exceed the corresponding NAAQS (i.e., attainment pollutants). The PSD program allows new sources of air pollution to be constructed, or existing sources to be modified, while preserving the existing ambient air quality levels, protecting public health and welfare, and protecting Class I areas (e.g., national parks and wilderness areas).

The PSD requirements apply to any project that is a new major stationary source or a major modification to an existing major stationary source. A major source is a listed facility (one of 28 PSD source categories listed in the federal Clean Air Act) that emits at least 100 TPY, or any other facility that emits at least 250 TPY.

Effective July 1, 2011, a stationary source that emits more than 100,000 TPY of GHGs is also considered to be a major stationary source.

A major modification is any project at a major stationary source that results in a significant increase in emissions of any PSD pollutant. A PSD pollutant is a criteria pollutant for which the area is not nonattainment for the federal ambient air quality standard (for SCAQMD, the PSD pollutants are SO_2, NOx, CO, lead, and GHGs).

A significant increase for a PSD pollutant is an increase above the significant emission rate for that pollutant (Table 3.1-10). It is important to note that, once PSD is triggered by any pollutant, PSD requirements apply to any PSD pollutant with an emission increase above the significance level, regardless of whether the facility is major for that pollutant. For ESGS, the facility is major because of GHG emissions. PSD review applies to the project's significant increases of NOx and PM_{10}, in addition to GHGs, even though the facility is not major for any of those pollutants.

EPA has delegated authority to the SCAQMD to implement the PSD program within the District's geographical boundaries. An application for a PSD permit was filed with the District on March 14, 2013.

TABLE 3.1-10
PSD Significant Emission Thresholds

Pollutant	PSD Significant Emission Threshold (TPY)*
SO_2	40
PM_{10}	15
$PM_{2.5}$	10
NOx	40
CO	100
Lead	0.6
GHGs	75,000

*40 CFR 52.21 (b)(1)(23).

The principal requirements for the PSD program include the following:

- Emissions of pollutants that are subject to PSD review must be controlled using BACT.
- Air quality impacts, in combination with other increment-consuming sources, must not exceed maximum allowable incremental increases.
- Air quality impacts of all sources in the area plus ambient pollutant background levels cannot exceed NAAQS.
- Pre- and/or post-construction air quality monitoring may be required.
- The air quality impacts on soils, vegetation, and nearby PSD Class I areas (specific national parks and wilderness areas) must be evaluated. (Note: The ESGS is located in a Class II area.)

Air Quality Monitoring

At its discretion, the PSD permit issuer may require pre-construction and/or post-construction ambient air quality monitoring for PSD sources if representative monitoring data are not already available. Pre-construction monitoring data must be gathered over a one-year period to characterize local ambient air quality. Post-construction air quality monitoring data must be collected as deemed necessary by the PSD permit issuer to characterize the impacts of proposed project emissions on ambient air quality.

Best Available Control Technology

BACT must be applied to any new or modified major source to minimize the emissions increase of those pollutants exceeding the PSD emission thresholds. EPA defines BACT as an emissions limitation based on the maximum degree of reduction for each subject pollutant, considering energy, environmental, and economic impacts, that is achievable through the application of available methods, systems, and techniques. BACT must be as stringent as any emission limit required by an applicable NSPS or NESHAP.

Air Quality Impact Analysis

An air quality dispersion analysis must be conducted to evaluate impacts of significant emission increases from new or modified facilities on ambient air quality. PSD source emissions must not cause or contribute to an exceedance of any ambient air quality standard, and the increase in ambient air concentrations must not exceed the allowable increments shown in Table 3.1-11. Once PSD is triggered for the project, all pollutants with emission increases above the PSD significance thresholds are subject to this requirement.

TABLE 3.1-11
PSD Increments and Significant Impact Levels

Pollutant	Averaging Time	SILs ($\mu g/m^3$)[a]	Maximum Allowable Class II Increments[b]
SO_2	Annual	1.0	20
	24-hr	5	91
	3-hr	25	512
	1-hr	7.8[c]	No 1-hr increment
PM_{10}	Annual	1.0	17
	24-hr	5	30
$PM_{2.5}$	Annual	0.3	4
	24-hr	1.2	9
NO_2	Annual	1.0	25
	1-hr	7.5[c]	No 1-hr increment
CO	8-hr	500	No CO increments
	1-hr	2,000	

[a]40 CFR 51.165 (b)(2).

[b]40 CFR 52.21 (c)

[c]EPA has not yet defined significance impact levels (SILs) for one-hour NO_2 or SO_2 impacts. However, EPA has suggested that, until SILs have been promulgated, values of 4 ppb (7.5 $\mu g/m^3$) for NO_2 and 3 ppb (7.8 $\mu g/m^3$) for SO_2 may be used. These values will be used in this analysis wherever a SIL would be used for NO_2 or SO_2.

Protection of Class I Areas

The potential increase in ambient air quality concentrations for attainment pollutants (i.e., NO_2, PM_{10}, or SO_2) within Class I areas closer than approximately 100 km may need to be quantified if the new or modified PSD source were to have a sufficiently large emission increase as evaluated by the Class I area Federal Land Managers. In such a case, a Class I visibility impact analysis would also be performed.

Growth, Visibility, Soils, and Vegetation Impacts

Impairment to visibility, soils, and vegetation resulting from PSD source emissions as well as associated commercial, residential, industrial, and other growth must be analyzed. This analysis includes cumulative impacts to local ambient air quality.

Administering Agency: SCAQMD, with EPA Region 9 oversight.

3.1.3.1.2 Nonattainment New Source Review

Authority: Clean Air Act §171-193, 42 USC §7501 et seq.; 40 CFR Parts 51 and 52

Requirement: Requires pre-construction review and permitting of new or modified major stationary sources of air pollution to allow industrial growth without interfering with the attainment and maintenance of ambient quality standards. In general, this program is implemented at the local level with EPA oversight.

- Emissions must be controlled to the lowest achievable emission rate (LAER).
- Sufficient offsetting emissions reductions must be obtained following the requirements in the regulations to continue reasonable further progress toward attainment of applicable NAAQS.
- The owner or operator of the new facility has demonstrated that major stationary sources owned or operated by the same entity in California are in compliance or on schedule for compliance with applicable emissions limitations in this rule.
- The administrator must find that the implementation plan has been adequately implemented.
- An analysis of alternatives must show that the benefits of the proposed source significantly outweigh any environmental and social costs.

Nonattainment new source review jurisdiction has been delegated to the SCAQMD for all pollutants and is discussed further under local LORS section below.

Administering Agency: SCAQMD, with EPA Region 9 oversight.

3.1.3.1.3 National Standards of Performance for New Stationary Sources

Authority: Clean Air Act §111, 42 USC §7411; 40 CFR Part 60

Requirements: Establishes national standards of performance to limit the emissions of criteria pollutants (air pollutants for which EPA has established NAAQS) from new or reconstructed facilities in specific source categories. Applicability of these regulations depends on equipment size, process rate, and date of construction. The project is subject to the following NSPS:

Subpart KKKK, Standards of Performance for Stationary Gas Turbines (constructed after February 18, 2005) is applicable to the gas turbines. Subpart KKKK limits NOx and SO_2 emissions from new gas turbines based on power output. The limits for gas turbines greater than 30 MW which are applicable to the proposed project's gas turbines are 0.39 lb NOx per MW-hr and 0.58 lb SO_2 per MW-hr. These standards are enforced at the local level with federal and state oversight.

Administering Agency: SCAQMD, with EPA Region 9 and CARB oversight.

3.1.3.1.4 National Emission Standards for Hazardous Air Pollutants

Authority: Clean Air Act §112, 42 USC §7412

Requirements: Establishes national emission standards to limit emissions of hazardous air pollutants (HAPs, or air pollutants identified by EPA as causing or contributing to the adverse health effects of air pollution but for which NAAQS have not been established) from facilities in specific source categories. These standards are implemented at the local level with federal oversight. Only the NESHAP for combustion turbines, which limits formaldehyde emissions from turbines, is potentially applicable to the proposed project.

Administering Agency: SCAQMD, with EPA Region 9 oversight.

3.1.3.1.5 Acid Rain Program

Authority: Clean Air Act §401 (Title IV), 42 USC §7651

Requirement: Requires the monitoring and reporting of emissions of acidic compounds and their precursors from combustion equipment owned by a utility. The principal source of these compounds is the combustion of fossil fuels. Therefore, Title IV established national standards to monitor, record, and, in some cases, limit SO_2 and NOx emissions from electrical power generating facilities. These standards are implemented at the local level with federal oversight. SCAQMD has received delegation authority to implement Title IV.

Administering Agency: SCAQMD, with EPA Region 9 oversight.

3.1.3.1.6 Title V Operating Permits Program

Authority: Clean Air Act §501 (Title V), 42 USC §7661

Requirements: Requires the issuance of operating permits that identify all applicable federal performance, operating, monitoring, recordkeeping, and reporting requirements. Title V applies to major facilities, Phase II acid rain facilities, subject solid waste incinerator facilities, and any facility listed by EPA as requiring a Title V permit. SCAQMD has received delegation authority for this program.

Administering Agency: SCAQMD, with EPA Region IX oversight.

3.1.3.1.7 Compliance Assurance Monitoring (CAM)

Authority: 40 CFR 64 Compliance Assurance Monitoring (CAM)

Requirements: Requires compliance monitoring at emission units at major stationary sources that are required to obtain a Title V permit, and that use control equipment to achieve a specified emission limit. The rule is intended to provide "reasonable assurance" that the control systems are operating properly to maintain compliance with the emission limits. CAM is usually implemented through the Title V permit. None of the sources proposed for this project are affected by CAM.

Administering Agency: SCAQMD, with EPA Region IX oversight.

3.1.3.2 State LORS

The California Air Resources Board (CARB) was created in 1968 by the Mulford-Carrell Air Resources Act, through the merger of two other state agencies. CARB's primary responsibilities are to develop, adopt, implement, and enforce the state's motor vehicle pollution control program; to administer and coordinate the state's air pollution research program; to adopt and update, as necessary, the state's ambient air quality standards; to review the operations of the local air pollution control districts; and to review and coordinate preparation of the SIP for achievement of the federal ambient air quality standards. CARB has implemented the following state or federal stationary source regulatory programs in accordance with the requirements of the federal Clean Air Act and California Health & Safety Code (H&SC):

- State Implementation Plan (SIP);
- California Clean Air Act;
- Nuisance Regulation;
- Toxic Air Contaminant Program;
- Air Toxics "Hot Spots" Act;
- CEC and CARB Memorandum of Understanding; and
- California Climate Change Regulatory Program.

3.1.3.2.1 State Implementation Plan

Authority: Health & Safety Code (H&SC) §39500 et seq.

Requirements: Required by the federal Clean Air Act, the SIP must demonstrate the means by which all areas of the state will attain and maintain NAAQS within the federally mandated deadlines. CARB reviews and coordinates preparation of the SIP. Local districts must adopt new rules (and/or revise existing rules) and demonstrate that the resulting emission reductions, in conjunction with reductions in mobile source emissions, will result in the attainment of NAAQS. The relevant SCAQMD Rules and Regulations that have also been incorporated into the SIP are discussed with the local LORS.

Administering Agency: SCAQMD, with CARB and EPA Region 9 oversight.

3.1.3.2.2 California Clean Air Act

Authority: H&SC §40910 – 40930

Requirements: Established in 1989, the California Clean Air Act requires local districts to attain and maintain both national and state ambient air quality standards at the "earliest practicable date." Local districts must prepare air quality plans demonstrating the means by which the ambient air quality standards will be attained and maintained. The SCAQMD Air Quality Plan is discussed with the local LORS.

Administering Agency: SCAQMD, with CARB oversight.

3.1.3.2.3 Nuisance Regulation

Authority: CA Health & Safety Code §41700

Requirements: Provides 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."

Administering Agency: SCAQMD and CARB

3.1.3.2.4 Toxic Air Contaminant Program

Authority: H&SC §39650 – 39675

Requirements: Established in 1983, the Toxic Air Contaminant Identification and Control Act created a two-step process to identify toxic air contaminants and control their emissions. CARB identifies and prioritizes the pollutants to be considered for identification as toxic air contaminants, and also assesses the potential for human exposure to a substance; the Office of Environmental Health Hazard Assessment (OEHHA) evaluates the corresponding health effects. Both agencies collaborate in the preparation of a risk assessment report, which concludes whether a substance poses a significant health risk and should be identified as a toxic air contaminant. In 1993, the Legislature amended the program to identify the 187 federal hazardous air pollutants as toxic air contaminants. CARB reviews the emission sources of an identified toxic air contaminant and, if necessary, develops air toxics control measures to reduce the emissions.

Administering Agency: SCAQMD and CARB

3.1.3.2.5 Air Toxic "Hot Spots" Act

Authority: H& SC §44300-44384; 17 CCR §93300-93347

Requirements: Established in 1987, the Air Toxics "Hot Spots" Information and Assessment Act (also known as AB 2588) supplements the toxic air contaminant program, by requiring the development of a statewide inventory of air toxics emissions from stationary sources. The program requires affected facilities to prepare (1) an emissions inventory plan that identifies relevant air toxics and sources of air toxics emissions; (2) an emissions inventory report quantifying air toxics emissions; and (3) a health risk assessment, if necessary, to characterize the health risks to the exposed public. Facilities whose air toxics emissions are deemed to pose a significant health risk must issue notices to the exposed population. In 1992, the Legislature amended the program to further require facilities whose air toxics emissions are deemed to pose a significant health risk to implement risk management plans to reduce the associated health risks. This program is implemented at the local level with state oversight.

Administering Agency: SCAQMD and CARB

3.1.3.2.6 CEC and CARB Memorandum of Understanding

Authority: CA Pub. Res. Code §25523(a); 20 CCR §1752, 1752.5, 2300-2309 and Div. 2, Chap. 5, Art. 1, Appendix B, Part (k)

Requirements: Provides for the inclusion of requirements in the CEC's decision on an application for certification to assure protection of environmental quality. The PTA is required to include information concerning air quality protection.

Administering Agency: California Energy Commission

3.1.3.2.7 California Climate Change Regulatory Program

Authority: Stats. 2006, Ch. 488 and CA Health & Safety Code § 38500-38599

Requirements: The State of California adopted the Global Warming Solutions Act of 2006 (Assembly Bill [AB] 32) on September 27, 2006, which requires sources within the state to reduce carbon emissions by approximately 25% by the year 2020. Pursuant to this statutory authority, CARB has adopted regulations to limit GHG emissions from electric power plants and other specific source categories. In addition, CARB has adopted regulations requiring the calculation and reporting of GHG emissions from subject facilities.

The PTA is required to include the project's emission rates of greenhouse gases (CO_2, CH_4, N_2O, and SF_6) from the stack, cooling towers, fuels and materials handling processes, delivery and storage systems, and from all on-site secondary emission sources.

On January 25, 2007, the PUC and CEC jointly adopted an interim Greenhouse Gas Emissions Performance Standard (EPS) in an effort to help mitigate climate change. The EPS is a facility-based emissions standard requiring that all new long-term commitments for baseload generation to serve California consumers be with power plants that have emissions no greater than a combined-cycle gas turbine plant. That level is established at 1,100 pounds of CO2 per megawatt-hour.

Administering Agencies: CARB and CEC.

3.1.3.3 Local LORS

When the state's air pollution statutes were reorganized in the mid-1960s, local air pollution control districts (APCDs) were required to be established in each county of the state (H&SC §4000 et seq.). There are three different types of districts: county, regional, and unified. In addition, special air quality management districts (AQMDs), with more comprehensive authority over non-vehicular sources as well as transportation and other regional planning responsibilities, have been established by the Legislature for several regions in California, (H&SC §40200 et seq.).

Air pollution control districts and air quality management districts in California have principal responsibility for the following activities:

- Developing plans for meeting the state and federal ambient air quality standard;
- Developing control measures for non-vehicular sources of air pollution necessary to achieve and maintain both state and federal air quality standards;
- Implementing permit programs established for the construction, modification, and operation of sources of air pollution; and
- Enforcing air pollution statutes and regulations governing non-vehicular sources; and for developing employer-based trip reduction programs.

Each level of government has adopted specific regulations that limit emissions from stationary combustion sources, several of which are applicable to this project. An application for a Determination of Compliance and Permit to Construct was filed with SCAQMD on March 15, 2013.

3.1.3.3.1 South Coast Air Quality Management District Rules and Regulations

Authority: CA Health & Safety Code §40001

Requirements: Prohibit emissions and other discharges (such as smoke and odors) from specific sources of air pollution in excess of specified levels.

Administering Agency: SCAQMD, with CARB oversight.

Permits Required

Under Regulation II, Rule 201, Permit to Construct (PTC), SCAQMD administers the air quality regulatory program for the construction, alteration, replacement, and operation of new power plants. As part of the PTA process, the project will be required to obtain a preconstruction Determination of Compliance (DOC) from the District. The District's permitting process allows the District to review new and modified air pollution sources to ensure compliance with all applicable prohibitory rules and to ensure that appropriate emission controls are used. Projects that are reviewed under the CEC PTA process must obtain a final DOC and PTC from the local air district (in this case, SCAQMD) prior to construction of the new power plant. The PTC remains in effect until the application for a Permit to Operate (PTO) is granted, denied, or canceled. Once the project commences operations and demonstrates compliance with the PTC, SCAQMD will issue a PTO. The PTO specifies conditions that the facility must meet to comply with all applicable air quality rules, regulations, and standards.

New Source Review Requirements

The District's New Source Review (NSR) rule (Regulation XIII, New Source Review) and Rule 2005 (New Source Review for RECLAIM) establish the criteria for siting new and modified emission sources; these rules are applicable to the proposed project. SCAQMD has been delegated authority for NSR rule development and enforcement. There are three basic requirements within the NSR rules. First, BACT and Lowest Achievable Emission Rate (LAER) requirements must be applied to any new source with potential emissions above specified threshold quantities. Second, all potential emission increases of nonattainment pollutants or precursors from the proposed source above specified thresholds must be offset by real, quantifiable, surplus, permanent, and enforceable emission decreases in the form of ERCs. Third, an ambient air quality impact analysis must be conducted to confirm that the project does not cause or contribute to a violation of a national or California AAQS or jeopardize public health.

Federal PSD Requirements

The District implements federal PSD requirements through two regulatory mechanisms. For all pollutants other than GHGs, the District implements the provisions of EPA regulations in 40 CFR 52.21, and 40 CFR 124, pursuant to a delegation agreement with EPA. For GHGs, District Rule 1714 has been approved by EPA into the State Implementation Plan; the SCAQMD implements the PSD program for GHG through the approval into the SIP of this rule. Rule 1714 incorporates by reference the provisions of 40 CFR 52.21 as those relate to GHGs; consequently, the substantive federal PSD requirements, as implemented by the SCAQMD, are found in 40 CFR 52.21.

New Source Review Requirements for Air Toxics

The SCAQMD's Rule 1401 (New Source Review for Air Toxics) describes the requirements, procedures, and standards for evaluating the potential impact of toxic air contaminants (TAC) from new sources and modifications to existing sources. The rule also requires a demonstration that the source will not exceed the health risk thresholds in Section (d) of the rule.

New Source Performance Standards

The SCAQMD's New Source Performance Standards (Regulation IX, Standards of Performance for New Stationary Sources) incorporates the federal NSPS from 40 CFR Part 60. The applicability and requirements of the New Source Performance Standards are discussed above under the federal regulations section.

Federal Programs and Permits

The federal Title IV acid rain program requirement and Title V operational permit requirements are in SCAQMD's Regulation XXXI (Acid Rain Permit Program) and Regulation XXX (Title V Permits). The applicability and requirements of these programs and permits are discussed above under the federal regulations section.

Public Notification

Because the proposed ESPFM project emissions will exceed the trigger levels in Rule 212(g), public notice is required and the project owner expects that the Air Pollution Control Officer will provide this notice in a timely manner.

Permit Fees

The SCAQMD requirements regarding permit fees are specified in Regulation III. This regulation establishes the filing and permit review fees for specific types of new sources, as well as annual renewal fees and penalty fees for existing sources.

Prohibitions

The SCAQMD prohibitions for specific types of sources and pollutants are addressed in Regulation IV. The prohibitory rules that apply to the proposed ESPFM project are listed below.

- Rule 401 – Visible Emissions: This rule prohibits any source from discharging any emissions of any air contaminant opacity of more than 20% (Ringelmann No.1) for a period or periods aggregating more than 3 minutes in any period of 60 consecutive minutes.
- Rule 402 – Nuisance: This rule prohibits the discharge from a facility of air contaminants that cause injury, detriment, nuisance, or annoyance to the public, or cause damage to business or property.
- Rule 403 – Fugitive Dust: The purpose of this rule is to reduce the amount of particulate matter entrained in the ambient air as a result of man-made fugitive dust sources by requiring actions to prevent, reduce, or mitigate fugitive dust emissions. 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.
- Rule 407 – Liquid and Gaseous Air Contaminants: This rule limits CO emissions to 2,000 ppmvd and SO_2 emissions to 500 ppmvd, averaged over 15 minutes.
- Rule 409 – Combustion Contaminants: This rule restricts the discharge of combustion contaminants (i.e., carbon-containing particulate matter) from the combustion of fuel to 0.23 grams per cubic meter (0.1 grain per cubic foot) of gas, calculated to 12% CO_2, averaged over 15 minutes.
- Rule 431.1 – Sulfur Content of Fuels: This rule prohibits any stationary source to use any gaseous fuel containing more than 16 ppmv sulfur compounds calculated as H_2S.
- Rule 474 – Fuel Burning Equipment-Oxides of Nitrogen: This Rule does not apply because the CTG is subject to NOx RECLAIM requirements.
- Rule 475 – Electric Power Generating Equipment: This rule applies to power generating equipment rated greater than 10 MW installed after May 7, 1976. Requirements specify that the equipment must comply with a PM_{10} mass emission limit of 11 lbs/hr or a PM_{10} concentration limit of 0.01 grains/dscf. Compliance is demonstrated if either the mass emission limit or the concentration limit is met.
- Rule 476 – Steam Generating Equipment: Superseded by NOx RECLAIM.

All applicable LORS are summarized in Table 3.1-12.

TABLE 3.1-12
Laws, Ordinances, Regulations, and Standards

LORS	Purpose	Regulating Agency	Permit or Approval	Schedule and Status of Permit	Conformance (Section)
Federal					
Clean Air Act (CAA) §160-169A and implementing regulations, Title 42 United States Code (USC) §7470-7491 (42 USC 7470-7491), Title 40 Code of Federal Regulations (CFR) Parts 51 & 52 (40 CFR 51 &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 air pollution. PSD review applies to pollutants for which ambient concentrations are lower than NAAQS.	SCAQMD with EPA oversight	Issues PSD Permit with conditions limiting emissions	Agency approval to be obtained before start of construction	§3.1.6.1
CAA §171-193, 42 USC §7501 et seq. (New Source Review)	Requires new source review (NSR) facility permitting for construction or modification of specified stationary sources. NSR applies to pollutants for which ambient concentration levels are higher than NAAQS.	SCAQMD with EPA oversight	After project review, issues FDOC/ATC with conditions limiting emissions.	Agency approval to be obtained before start of construction	§3.1.6.1
CAA §401 (Title IV), 42 USC §7651 (Acid Rain Program)	Requires quantification of NO_2 and SO_2 emissions, and requires operator to hold allowances.	SCAQMD with EPA oversight	Issues Acid Rain permit after review of application	Application to be submitted 18 months prior to start of operation.	§3.1.6.1
CAA §501 (Title V), 42 USC §7661 (Federal Operating Permits Program)	Establishes comprehensive permit program for major stationary sources.	SCAQMD with EPA oversight	Issues Title V permit after review of application	Application to be submitted 12 months after start of operation.	§3.1.6.1
CAA §111, 42 USC §7411, 40 CFR Part 60 (New Source Performance Standards [NSPS])	Establishes national standards of performance for new stationary sources.	SCAQMD with EPA oversight	After project review, issues FDOC/ATC with conditions limiting emissions.	Agency approval to be obtained before start of construction	§3.1.6.1
CAA §112, 42 USC §7412, 40 CFR Part 63 (National Emission Standards for Hazardous Air Pollutants [NESHAPs])	Establishes national emission standards for hazardous air pollutants.	SCAQMD with EPA oversight	After project review, issues FDOC/ATC with conditions limiting emissions.	Agency approval to be obtained before start of construction	§3.1.6.1
State					
California Health & Safety Code (H&SC) §41700 (Nuisance Regulation)	Prohibits discharge of such quantities of air contaminants that cause injury, detriment, nuisance, or annoyance	SCAQMD with CARB oversight	After project review, issues FDOC/ATC with conditions limiting emissions.	Agency approval to be obtained before start of construction	§3.1.6.2
H&SC §44300-44384; California Code of Regulations (CCR) §93300-93347 (Toxic "Hot Spots" Act)	Requires preparation and biennial updating of facility emission inventory of hazardous substances; risk assessments.	SCAQMD with CARB oversight	After project review, issues FDOC/ATC with conditions limiting emissions.	Agency approval to be obtained before start of construction	§3.1.6.2

TABLE 3.1-12
Laws, Ordinances, Regulations, and Standards

LORS	Purpose	Regulating Agency	Permit or Approval	Schedule and Status of Permit	Conformance (Section)
California Public Resources Code §25523(a); 20 CCR §1752, 2300-2309 (CEC & CARB Memorandum of Understanding)	Requires that CEC's decision on PTA include requirements to assure protection of environmental quality; PTA required to address air quality protection.	CEC	After project review, issues conditions of certification that includes the conditions in the FDOC		§3.1.6.2
Global Warming Solutions Act and other GHG reduction measures	Minimize emissions of GHG from all sources in CA; operator must purchase and surrender GHG allowances	CEC and CARB	After project review, CEC issues conditions of certification requiring reporting of GHG emissions		§3.1.6.2
Local					
California Health & Safety Code (H&SC) §40001 (Air pollution--general)	Prohibit emissions and other discharges (such as smoke and odors) from specific sources of air pollution in excess of specified levels.	SCAQMD with CARB oversight	After project review, issues FDOC/ATC with conditions limiting emissions.	Agency approval to be obtained before start of construction	§3.1.6.3
SCAQMD Regulation II, Rule 201 (Permits required)	Administers air quality regulation program for power plants	SCAQMD with CARB oversight	After project review, issues FDOC/ATC with conditions limiting emissions.	Agency approval to be obtained before start of construction	§3.1.6.3
SCAQMD Regulation XIII (New Source Review)	Establishes criteria for siting new and modified emission sources.	SCAQMD with CARB oversight	After project review, issues FDOC/ATC with conditions limiting emissions.	Agency approval to be obtained before start of construction	§3.1.6.3
SCAQMD Regulation XVII (Prevention of Significant Deterioration)	Establishes criteria for siting new and modified emission sources.	SCAQMD with CARB oversight	After project review, issues FDOC/ATC with conditions limiting emissions.	Agency approval to be obtained before start of construction	§3.1.6.1
SCAQMD Rule 1401 (Toxic Air Contaminants New Source Review)	Establishes procedures for review and control of toxic air contaminants from new sources	SCAQMD with CARB oversight	After project review, issues FDOC/ATC with conditions limiting emissions.	Agency approval to be obtained before start of construction	§3.1.6.3
SCAQMD Regulation IX, Standards of Performance for New Stationary Sources	Incorporates federal NSPS standards.	SCAQMD with CARB oversight	After project review, issues FDOC/ATC with conditions limiting emissions.	Agency approval to be obtained before start of construction	§3.1.6.3
SCAQMD Regulation XXX and XXXI (Federal permits)	Implements Acid Rain and Title V permit programs	SCAQMD with EPA oversight	After project review, issues FDOC/ATC with conditions limiting emissions.	Agency approval to be obtained before start of construction	§3.1.6.3

TABLE 3.1-12
Laws, Ordinances, Regulations, and Standards

LORS	Purpose	Regulating Agency	Permit or Approval	Schedule and Status of Permit	Conformance (Section)
SCAQMD Rule 212	Public Notification Requirement	SCAQMD with CARB oversight	After project review, issues FDOC/ATC with conditions limiting emissions.	Agency approval to be obtained before start of construction	§3.1.6.3
SCAQMD Regulation III (Permit Fees)	Permit fees	SCAQMD		Payment of fees required at time of application	§3.1.6.3
SCAQMD Rule 401 (Visible Emissions)	Prohibits visible emissions above certain levels.	SCAQMD with CARB oversight	After project review, issues FDOC/ATC with conditions limiting emissions.	Agency approval to be obtained before start of construction	§3.1.6.3
SCAQMD Rule 402 (Nuisance)	Prohibit emissions and other discharges (such as smoke and odors) from specific sources of air pollution in excess of specified levels.	SCAQMD with CARB oversight	After project review, issues FDOC/ATC with conditions limiting emissions.	Agency approval to be obtained before start of construction	§3.1.6.3
SCAQMD Rule 403 (Fugitive Dust)	Limits emissions of particulate matter	SCAQMD with CARB oversight	After project review, issues FDOC/ATC with conditions limiting emissions.	Agency approval to be obtained before start of construction	§3.1.6.3
SCAQMD Rules 407 and 409(Liquid and Gaseous Air Contaminants, Combustion Contaminants)	Limits CO, SO_2, and PM in exhaust	SCAQMD with CARB oversight	After project review, issues FDOC/ATC with conditions limiting emissions.	Agency approval to be obtained before start of construction	§3.1.6.3
SCAQMD Rule 431.1 (Fuel Sulfur)	Limits sulfur content of fuel	SCAQMD with CARB oversight	After project review, issues FDOC/ATC with conditions limiting emissions.	Agency approval to be obtained before start of construction	§3.1.6.3
SCAQMD Rule 475 (Electric Power Generating Equipment)	Limits PM_{10} emissions from power generating equipment	SCAQMD with CARB oversight	After project review, issues FDOC/ATC with conditions limiting emissions.	Agency approval to be obtained before start of construction	§3.1.6.3

3.1.4 Environmental Consequences

This section evaluates the potential air quality impacts of the project. Project impacts would be considered significant if emissions from the project cause or contribute to a violation of an ambient air quality standard. A project causes or contributes to a violation of an ambient air quality standard if it has a non-de minimis impact at a time and location where a violation of an ambient air quality standard occurs.

Project operating emissions of nonattainment pollutants and their precursors will be offset to ensure that the project will result in no net regional increase in annual emissions of nonattainment pollutants. Emissions estimates for all aspects of both construction and operation of the project are presented in this subsection. Dispersion modeling was conducted to determine project impacts on ambient air quality, and those results are also presented in this section, along with a discussion of dispersion model selection and the selection of model input data (i.e., emissions scenarios and release parameters, building wake effects, meteorological data, and receptor locations). Documentation that the project will comply with applicable local, state, and federal air quality regulatory requirements is also provided.

3.1.4.1 Construction Emissions

Emissions during the construction phase of the project have been estimated, including an assessment of emissions from vehicle and equipment exhaust and the fugitive dust generated from vehicle movement and material handling. A dispersion modeling analysis was conducted based on these emissions. A detailed analysis of the construction emissions and associated ambient impacts is included in Appendix 3.1D. The results of the analysis indicate that the maximum construction impacts will be below the state and federal standards for all the criteria pollutants emitted. The best available emission control techniques will be used. The project construction impacts are not unusual in comparison to most construction sites; construction sites that use good dust suppression techniques and low-emitting vehicles typically do not cause violations of air quality standards.

The primary emission sources during construction will include exhaust from construction equipment and vehicles and fugitive dust generated in areas disturbed by grading, excavating, and erection of facility structures. The projected construction schedule has a duration of 18 to 20 months, during which different areas within the proposed site and a nearby temporary laydown area will be disturbed. Estimated land disturbance for major construction activities is summarized in Section 2.0, Project Description.

Construction equipment and vehicle exhaust emissions were estimated using equipment lists and construction scheduling information provided by the project design engineering firm, which are presented in Section 2.0, Project Description, and Appendix 3.1D. The California Emissions Estimator Model (CalEEMod) was used to generate equipment-specific emission factors for all criteria pollutants for diesel-fueled construction equipment and for on-road vehicles. CalEEMod was developed in collaboration with California's air districts (including SCAQMD), and utilizes CARB's EMFAC model (for on-road emission sources), and OFFROAD model (for off-road emission sources). For this project, the latest emission factors from EMFAC2011 were input into CalEEMod, as well as project-specific mitigation options. Assumptions used in calculating project construction emissions included a 20-month construction period; 5 construction days per week; and a single-shift, 8-hour workday (except during the grading phase, where 6 construction days per week was assumed). The list of fueled equipment needed during each month of the construction effort (see Appendix 3.1D) served as the basis for estimating pollutant emissions throughout the term of construction and helped to identify the periods of probable maximum short-term emissions.

Fugitive dust emissions resulting from on-site soil disturbances were estimated using CalEEMod which, in turn, uses EPA AP-42 emission factors for construction activities, including bulldozing and dirt-pushing, travel on paved and unpaved roads, material handling, and wind erosion to storage of aggregate materials. For traveling on unpaved surfaces at the project site and temporary construction area activities, a combined dust control efficiency of 61 percent was assumed to be achieved by the mitigation measures of frequent watering and limiting speeds to 15 miles per hour.

Emissions from on-road delivery trucks and worker commute trips were estimated using CalEEMod (using EMFAC2011 emission factors), with the trip generation information presented in Section 2. Construction workers were assumed to commute to the proposed project site from locations within the greater Los Angeles area.

The short-term maximum emissions were calculated using Month 19 for construction equipment and Month 6 for fugitive dust. Activities in month 19 include building and facility construction. Activities in Month 6 are primarily grading and other site preparation activities. Annual emissions were based on the worst 12 consecutive months of the construction period, which were Months 4-15 of the 20-month schedule.

Maximum daily construction emissions are shown in Table 3.1-13. Maximum annual construction emissions are shown in Table 3.1-14.

TABLE 3.1-13
Maximum Daily Construction Emissions, Pounds per Day—Month 19 (Combustion), Month 6 (Fugitive Dust)

	NOx	CO	VOC	SOx	PM_{10}	$PM_{2.5}$
Onsite						
Construction Equipment	206	218	32	0.4	13	13
Fugitive Dust	—	—	—	—	206	218
Offsite						
Worker Travel, Truck Deliveries, Rail Deliveries	89	321	30	1	6	93
Total	**295**	**539**	**63**	**1**	**24**	**115**

TABLE 3.1-14
Maximum Annual Construction Emissions, Tons per Year

	NOx	CO	VOC	SOx	$PM_{2.5}$	PM_{10}
Onsite						
Construction Equipment	19.8	23.5	3.1	0.0	1.5	1.5
Fugitive Dust	—	—	—	—	0.2	0.4
Offsite						
Worker Travel, Truck Deliveries	8.1	30.3	2.6	0.0	0.5	7.5
Total	**28.0**	**53.8**	**5.7**	**0.0**	**2.2**	**9.4**

3.1.4.2 Emitting Units

Key operating parameters are summarized below. Additional information relating to the fuel characteristics, heat rate, and startup and operating limits of ESPFM may be found in Section 2.0, Facility Description, and Appendix 3.1A–H.

- GE 7FA Fast Start Combined-Cycle Unit, 325 MW (net)
  - 5,456 hours per year normal operation including 200 startup/shutdown cycles
  - Fueled exclusively with natural gas
- Rolls Royce Trent 60 Simple-Cycle Unit, 55 MW (net) (two units)
  - 4,800 hours per year normal operation including 480 startup/shutdown cycles (each)

  - Fueled exclusively with natural gas

- Auxiliary Boiler, 36 MMBtu/Hr (Nominal)
  - Up to 8,760 hours per year at 25% load
  - Fueled exclusively with natural gas

3.1.4.3 Turbine Commissioning

Gas turbine commissioning consists of no-load, partial-load, and full-load testing performed immediately after construction for the purposes of optimizing turbo machinery and gas turbine combustors, and optimizing and testing of the SCR systems. Several parameters—such as gas turbine load, degree of combustor tuning, and degree of SCR control—may be varied simultaneously during testing. Emissions during the commissioning year may be higher than those during a non-commissioning year for some pollutants due to the fact that the combustors may not be optimally tuned and the SCR systems may be only partially operational or not operational at all. The commissioning schedule will comprise several phases in which each of the CTGs will be operated at various loads; the degree of SCR and oxidation catalyst system control may vary during these periods as well. It will be assumed that the commissioning of the units will be simultaneous to address the worst-case scenario.

Average commissioning emission rates for each turbine are shown in Table 3.1-15, and details of the commissioning schedule and associated emissions for each turbine are presented in Appendix 3.1E.

TABLE 3.1-15
Commissioning Emissions

		Average Pollutant Emission Rates				
Unit	**Duration (Hours)**	**NOx (lb/hr)**	**CO (lb/hr)**	**VOC (lb/hr)**	**SO_2 (lb/hr)**	**PM_{10} (lb/hr)**
GE Turbine (Unit 9)	415	30.1	314.1	16.8	1.4	9.4
Trent Turbine (Unit 11)	121	44.1	116.7	10.0	0.4	7.9
Trent Turbine (Unit 12)	121	44.1	116.7	10.0	0.4	7.9

3.1.4.4 Operational Emissions

The emission sources of the project will be the three combustion turbine generators (CTGs), the duct burner for the combined cycle unit, and the auxiliary boiler, all of which will burn exclusively natural gas fuel. Maximum annual operational emissions from the combined cycle unit were based on 5,056 hours of full load operation, plus 200 hours including a startup, plus 200 hours including a shutdown. Maximum annual operational emissions from each simple cycle unit were based on 3,840 hours of full load operation, plus 480 hours including a startup, plus 480 hours including a shutdown.

Criteria pollutant emissions from the gas turbines are summarized in Table 3.1-16. Emissions of NOx, CO, and VOC from the CTGs were calculated from emission exhaust concentration limits (expressed as ppmv @ 15 percent O_2) and the exhaust flow rates from vendor performance data. The proposed NOx emission limits of 2.0 ppmv (for the combined cycle unit) and 2.5 ppmv (for the simple cycle units) reflect the application of SCR. The proposed VOC emission limit of 2.0 ppmv reflects the use of good combustion practices. The proposed CO emission limits of 2.0 ppmv (for the combined cycle unit) and 4.0 ppmv (for the simple cycle units) reflect the expected performance of the oxidation catalyst.

Maximum hourly PM_{10} emissions reflect expected turbine performance, based on emission limits from similar installations. For regulatory purposes, all of the particulate matter emitted from the fuel burning equipment is assumed to be less than 2.5 microns in diameter. All references to PM_{10} from project sources include $PM_{2.5}$ as well, even though some fraction of PM_{10} emissions are likely to be larger than 2.5 microns in size.

SO_2 emissions were calculated from the heat input (in MMBtu) and an SO_2 emission factor (in lb/MMBtu). Hourly SO_2 emissions were calculated based on the proposed maximum allowable fuel sulfur content of 0.75 grain per

100 standard cubic feet (scf). Annual SO_2 emissions were calculated based on the expected annual average fuel sulfur content of 0.25 grain per 100 standard cubic feet (scf).

TABLE 3.1-16
Maximum Emission Rates—Combustion Turbines

Pollutant	ppmv @ 15% O_2	lb/MMBtu	lb/hr
Unit 9 (GE Turbine plus duct burner)			
NOx	2.0	0.0074	17.9
SO_2[a]	0.4	0.0021	1.7
CO	2.0	0.0045	10.9
VOC	2.0	0.0026	6.2
$PM_{10}/PM_{2.5}$[b]	—	—	9.5
Trent Combustion Turbines (each)			
NOx	2.5	0.0092	4.8
SO_2[a]	0.4	0.0021	1.1
CO	4.0	0.0090	4.6
VOC	2.0	0.0026	1.3
$PM_{10}/PM_{2.5}$[b]	—	—	5.0

Note: NOx, CO, VOC, and PM_{10} emission rates exclude startups and shutdowns (see Table 3.1-17).

[a]Based on maximum natural gas sulfur content of 0.75 gr/100 scf. See text.

[b]Includes front and back half.

Combustion turbine performance was evaluated for a number of operating scenarios with different turbine loads (ranging from 50% load to 100% load), and ambient temperatures ranging from a low of 41°F to a high of 90°F. The maximum hourly emissions for all criteria pollutants from a turbine during normal operations are expected to occur under the conditions with the highest firing rate: 100% load, use of evaporative cooling, and 41°F ambient temperature (for the GE Turbine); and 100% load and 78°F ambient temperature (for the Trent Turbines).

Start-Up and Shutdown Emissions

GE Turbine: Two types of startups have been identified for the GE turbines: fast start and traditional. The principal difference between the two is the amount of time needed to bring the gas turbine to full operating load. Because the turbines will reach full load more quickly under fast start conditions, the oxidation and SCR catalysts will reach operating temperature more quickly as well. SO_2 and PM emissions are essentially the same for both startup types; thus, the differences between the two types of startups, from an emissions standpoint, are that the traditional startup takes longer (60 minutes instead of the 30 minutes for a fast start), and has higher VOC, CO, and NOx emissions.

The project owner expects that there will be up to 200 startup hours per year for the GE CTG. During a fast CTG startup, there are approximately 30 minutes with elevated emissions (emissions higher than during normal operation). Consequently, the hourly emission rates during CTG startups are based on 30 minutes of elevated emissions followed by 30 minutes of normal operating emission levels (for fast starts) and, as a worst case, 60 minutes of elevated emissions for a traditional start. In addition, there will be up to 200 shutdown hours per year. During a CTG shutdown, there are approximately 30 minutes with elevated emissions (emissions higher than during normal operation). Consequently, the hourly emission rates during CTG shutdowns are based on 30 minutes of normal operating emission levels followed by 30 minutes of elevated emission levels.

The detailed CTG startup hourly emission calculations are shown in Appendix 3.1A. The project owner expects that there could be as many as two startup hours and two shutdown hours per day. During start-up/shutdown operations, the CTG is assumed to operate at elevated NOx and CO concentration rates due to the phased-in effectiveness of the DLN combustors, SCR systems, and oxidation catalysts.

Trent Turbines: The project owner expects that there will be up to 480 startup hours per year for each Trent CTG. During a Trent CTG startup, there are approximately 30 minutes with elevated emissions (emissions higher than during normal operation). Consequently, the hourly emission rates during Trent CTG startups are based on 30 minutes of elevated emissions followed by 30 minutes of normal operating emission levels. In addition, there will be up to 480 shutdown hours per year per turbine. During a Trent CTG shutdown, there are approximately 20 minutes with elevated emissions (emissions higher than during normal operation). Consequently, the hourly emission rates during Trent CTG shutdowns are based on 40 minutes of normal operating emission levels followed by 20 minutes of elevated emission levels. For the Trent turbines, periodically there could be an hour when both a startup and a shutdown occur. For this hour, there would be 30 minutes of elevated emissions due to the startup, 10 minutes of normal operation emissions, followed by 20 minutes of elevated emissions due to a shutdown. While this situation is expected to occur very infrequently, from an hourly emission standpoint this would represent worst-case hourly emissions, and as such it is evaluated in the ambient air impact analysis for the proposed project.

The detailed CTG startup hourly emission calculations are shown in 3.1-17. The project owner expects that there could be as many as four startup hours and four shutdown hours per day per Trent CTG. During start-up/shutdown operations, the Trent CTG is assumed to operate at elevated NOx and CO concentration rates due to the phased-in effectiveness of the DLE combustors, SCR systems, and oxidation catalysts.

TABLE 3.1-17
El Segundo Power Facility Modification—Turbine Startup/Shutdown Emissions

Mode	Time (minutes)	Total Emissions Per Event (pounds)			
		NOx	**CO**	**VOC**	**PM**
GE Turbine					
Startup (fast start)	30	36	153	14	5
Startup (traditional)	60	62	291	23	5
Shutdown	30	29	317	32	2
Trent Turbines (each)					
Startup	30	28.0	87.5	6.7	3.8
Shutdown	20	7.1	60.0	4.7	2.2

The maximum expected emissions for each averaging period were used in the compliance demonstration modeling, and are summarized in Table 3.1-18.

TABLE 3.1-18

Emission Summary (Maximum for Each Averaging Period)

Equipment	NOx			Sox			CO			VOC			PM_{10}		
	Max lb/hr[a]	Max lb/day	Total TPY	Max lb/hr[a]	Max lb/day	Total TPY	Max lb/hr[a]	Max lb/day	Total TPY	Max lb/hr[a]	Max lb/day	Total TPY	Max lb/hr[a]	Max lb/day	Total TPY
Unit 9[b]	62.3	559.1	54.0	5.1	124.8	4.6	322.0	1322.8	79.0	34.6	240.7	21.1	9.5	237.5	25.9
Unit 11[c]	30.4	238.6	18.9	1.1	23.9	0.8	89.8	685.6	45.6	7.4	72.9	5.6	5.0	120.0	12.0
Unit 12[c]	30.4	238.6	18.9	1.1	23.9	0.8	89.8	685.6	45.6	7.4	72.9	5.6	5.0	120.0	12.0
Auxiliary Boiler[d]	0.1	2.4	0.4	0.0	0.4	0.1	0.3	8.0	1.5	0.0	0.9	0.2	0.3	1.6	0.3

[a]Maximum hourly turbine emissions based on startup emissions for NOx, shutdown emissions for CO, and worst case normal operations for other pollutants. See Appendix 3.1A, Table 3.1A-22 and 3.1A-24 for calculation of hourly emissions during startup/shutdown.

[b]Annual emissions based on 5,456 hours of operations including 200 startup and shutdown events.

[c]Annual emissions based on 4,800 hours of operations including 480 startup and shutdown events.

[d]Annual emissions based on 8,760 hours of operations at 25% load.

3.1.4.5 Non-Criteria Pollutant Emissions

A health risk assessment was performed to determine the potential for public health impacts of non-criteria pollutants emitted by the project. Emissions are summarized in Table 3.1-19. The health risk assessment itself is presented in Section 3.8, Public Health.

TABLE 3.1-19
Non-Criteria Pollutant Emission Totals for Modeling

	Emissions, lb/hr			
Pollutant	**Unit 9**	**Units 11/12 (each)**	**Aux Boiler**	**Total, TPY**
Turbines				
Ammonia	1.34E+01	1.99E+00		61.77
Propylene	1.82E+00	3.86E-01	1.85E-02	6.91
Hazardous Air Pollutants (HAPs)				
Acetaldehyde	9.65E-02	2.04E-02	1.08E-04	0.36
Acrolein	1.54E-02	3.27E-03	9.44E-05	0.06
Benzene	2.90E-02	6.13E-03	2.03E-04	0.11
1,3-Butadiene	1.04E-03	2.20E-04		0.00
Ethylbenzene	7.72E-02	1.64E-02	2.41E-04	0.29
Formaldehyde	8.69E-01	1.84E-01	4.30E-04	3.25
Hexane, n-	6.13E-01	1.30E-01	1.61E-04	2.29
Naphthalene	3.14E-03	6.64E-04	1.05E-05	0.01
PAHs (listed individually below)	N/A	N/A	1.40E-05	
Anthracene	8.00E-05	1.69E-05		0.00
Benzo(a)anthracene	5.35E-05	1.13E-05		0.00
Benzo(a)pyrene	3.29E-05	6.96E-06		0.00
Benzo(b)fluoranthrene	2.67E-05	5.66E-06		0.00
Benzo(k)fluoranthrene	2.60E-05	5.51E-06		0.00
Chrysene	5.96E-05	1.26E-05		0.00
Dibenz(a,h)anthracene	5.56E-05	1.18E-05		0.00
Indeno(1,2,3-cd)pyrene	5.56E-05	1.18E-05		0.00
Propylene oxide	7.00E-02	1.48E-02		0.26
Toluene	3.14E-01	6.64E-02	9.26E-04	1.17
Xylene	1.54E-01	3.27E-02	6.89E-04	0.58
Total HAPs*				8.39

*Ammonia and propylene are not HAPs so are not included in this total.

3.1.4.6 Greenhouse Gas Emissions

Potential maximum annual GHG emissions for the operational ESPFM were calculated using the calculation methods and emission factors from the USEPA GHG Reporting Regulation.[2] Table 3.1-20 presents the estimated GHG emissions due to project operations as carbon dioxide equivalent [CO_2e]. Emissions of methane, nitrous oxide, and sulfur hexafluoride have been converted to carbon dioxide equivalents using GHG warming potentials of 21, 310, and 23,900 respectively. The estimated emissions include the combustion emissions for the three turbines. They also include sulfur hexafluoride leakage emissions from three switchyard circuit breakers.

[2] 40 CFR 98 Subpart C, Tables C-1 and C-2.

One-time GHG emissions from construction activities are presented in Table 3.1-21.

Appendix 3.1-A presents supporting technical information and calculation spreadsheets used to develop emissions data for the various scenarios of the operational project.

TABLE 3.1-20
Project Greenhouse Gas Emissions

Unit	CO_2 metric tons/year	CH_4 metric tons/year	N_2O metric tons/year	SF_6 metric tons/year	CO_2eq metric tons/yr*	CO_2 metric tons/MWh
CTGs	967,315	18	2	<1	968,264	0.407

*Includes CH_4, N_2O, and SF_6.

TABLE 3.1-21
Construction Greenhouse Gas Emissions

Unit	CO_2, metric tons	CH_4, metric tons	N_2O, metric tons	CO_2eq, metric tons
Offroad Fuel Use	78	3.19E-03	6.38E-04	5,874
Worker Travel	307	1.30E-02	2.60E-03	6,548
Truck Deliveries	81	3.34E-03	6.68E-04	1,101
Total	**466**	**1.95E-02**	**3.91E-03**	**13,524**

3.1.4.7 Air Dispersion Modeling

An assessment of impacts from the ESPFM on ambient air quality has been conducted using EPA-approved air quality dispersion models, following the modeling protocol submitted to the agencies in November 2012 (See Appendix 3.1C) and subsequent discussions with District staff. These models are based on various mathematical descriptions of atmospheric diffusion and dispersion processes in which a pollutant source impact can be calculated over a given area.

The impact analysis was used to determine the worst-case ground-level impacts of the project. The results were compared with established state and federal ambient air quality standards and PSD significance levels. If the standards are not exceeded under worst-case conditions then it is inferred that, in the operation of the facility, no exceedances are expected under any conditions. In accordance with the air quality impact analysis guidelines developed by EPA (40 CFR Part 51, Appendix W: Guideline on Air Quality Models) and CARB (Reference Document for California Statewide Modeling Guideline, April 1989), the ground-level impact analysis includes the following assessments:

- Impacts in simple, intermediate, and complex terrain;
- Aerodynamic effects (downwash) due to nearby building(s) and structures; and
- Impacts from inversion breakup (fumigation).

Simple, intermediate, and complex terrain impacts were assessed for all meteorological conditions that would limit the amount of final plume rise. Plume impaction on elevated terrain, such as on the slope of a nearby hill, can cause high ground-level concentrations, especially under stable atmospheric conditions. Another dispersion condition that can cause high ground-level pollutant concentrations is caused by building downwash. Building downwash can occur when wind speeds are high and a building or structure is in close proximity to the emission stack. This can result in building wake effects where the plume is drawn down toward the ground by the lower pressure region that exists in the lee side (downwind) of the building or structure.

Fumigation conditions occur when the plume is emitted into a low-lying layer of stable air (inversion) that then becomes unstable, resulting in a rapid mixing of pollutants towards the ground. The low mixing height that results from this condition allows little diffusion of the stack plume before it is carried downwind to the ground. Although fumigation conditions rarely last as long as an hour, relatively high ground-level concentrations may be reached during that period. Fumigation tends to occur under clear skies and light winds, and is more prevalent in the summer.

The basic model equation used in this analysis assumes that the concentrations of emissions within a plume can be characterized by a Gaussian distribution about the centerline of the plume. Concentrations at any location downwind of a point source such as a stack can be determined from the following equation:

$$C(x, y, z, H) = \left(\frac{Q}{2\pi\sigma_y\sigma_z u}\right) * \left(e^{-1/2(y/\sigma y)^2}\right) * \left(\left[e^{-1/2(z-H/\sigma_z)^2}\right] + \left[e^{-1/2(z+H/\sigma_z)^2}\right]\right)$$

Where:

C = the concentration in the air of the substance or pollutant in question

Q = the pollutant emission rate

σ_y, σ_z = the horizontal and vertical dispersion coefficients, respectively, at downwind distance x

u = the wind speed at the height of the plume center

x,y,z = the variables that define the 3-dimensional Cartesian coordinate system used; the downwind, crosswind, and vertical distances from the base of the stack

H = the height of the plume above the stack base (the sum of the height of the stack and the vertical distance that the plume rises due to the momentum and/or buoyancy of the plume)

Gaussian dispersion models are approved by EPA for regulatory use and are based on conservative assumptions (i.e., the models tend to overpredict actual impacts by assuming steady-state conditions, no pollutant loss through conservation of mass, no chemical reactions, etc.). The EPA models were used to determine if ambient air quality standards would be exceeded, and whether a more accurate and sophisticated modeling procedure would be warranted to make the impact determination. The following sections describe:

- Screening modeling procedures;
- Refined air quality impact analysis;
- Existing ambient pollutant concentrations and preconstruction monitoring;
- Results of the ambient air quality modeling analyses; and
- PSD increment consumption.

3.1.4.8 Model Selection

The screening and refined air quality impact analyses were performed using the American Meteorological Society/EPA Regulatory Model Improvement Committee (AERMIC) model, also known as AERMOD (current version 12345). The AERMOD model is a steady-state, multiple-source, Gaussian dispersion model designed for use with stack emission sources situated in terrain where ground elevations can exceed the stack heights of the emission sources (i.e., complex terrain).[3] The model is capable of estimating concentrations for a wide range of averaging times (from 1 hour to 1 year). Inputs required by the AERMOD model include the following:

- Model options;
- Meteorological data;
- Source data; and
- Receptor data.

Model options refer to user selections that account for conditions specific to the area being modeled or to the emissions source that needs to be examined. Examples of model options include use of site-specific vertical

[3] AERMOD was adopted in November 2005 as a guideline model by EPA as a replacement for ISCST3. AERMOD incorporates an improved downwash algorithm as compared to ISCST3 (Federal Register, November 9, 2005; Volume 70, Number 216, Pages 68218-68261).

profiles of wind speed and temperature; consideration of stack and building wake effects; and time-dependent exponential decay of pollutants. The model supplies recommended default options for the user for some of these parameters.

AERMOD uses hourly meteorological data to characterize plume dispersion. The representativeness of the data is dependent on the proximity of the meteorological monitoring site to the area under consideration, the complexity of the terrain, the exposure of the meteorological monitoring site, and the period of time during which the data are collected. The District provided a meteorological data set appropriate for use with AERMOD. The data set combined surface meteorological data (e.g., wind speed and direction, temperature) from the District's LAX Airport monitoring station and upper air data from the Marine Corps Air Station Miramar (MCAS Miramar) in San Diego.

3.1.4.9 Good Engineering Practice Stack Height Analysis

For the purposes of modeling, a stack height beyond what is required by Good Engineering Practices (GEP) is not allowed (40 CFR Part 60 §51.164). However, this requirement does not place a limit on the actual constructed height of a stack. GEP as used in modeling analyses is the height necessary to ensure that emissions from the stack do not result in excessive concentrations of any air pollutant in the immediate vicinity of the source as a result of atmospheric downwash, eddies, or wakes that may be created by the source itself, nearby structures, or nearby terrain obstacles. In addition, the GEP stack height modeling restriction assures that any required regulatory control measure is not compromised by the effect of that portion of the stack that exceeds the GEP height. The EPA guidance ("Guideline for Determination of Good Engineering Practice Stack Height," Revised 6/85) for determining GEP stack height indicates that GEP is the greater of 65 meters or H_g, where H_g is calculated as follows:

$$H_g = H + 1.5L$$

Where:

H_g = Good Engineering Practice stack height, measured from the ground-level elevation at the base of the stack

H = height of nearby structure(s) measured from the ground-level elevation at the base of the stack

L = lesser dimension, height or maximum projected width, of nearby structure(s)

The turbine stack heights, at 100 feet, are less than the GEP limit of 65 meters (213 feet). Stack heights therefore do not need to be adjusted for GEP.

3.1.4.10 Receptor Grid Selection and Coverage

Receptor and source base elevations were determined from USGS National Elevation Dataset (NED) data in the GeoTIFF format at a horizontal resolution of 1 arc-second (approximately 30 meters). All coordinates were referenced to UTM North American Datum 1983 (NAD83), Zone 11. The AERMOD receptor elevations were interpolated among the DEM nodes according to standard AERMAP procedure. For determining concentrations in elevated terrain, the AERMAP terrain preprocessor receptor-output (ROU) file option was chosen; hills were not imported into AERMOD for CTDM-like processing.

Cartesian coordinate receptor grids were used to provide adequate spatial coverage surrounding the project area for assessing ground-level pollution concentrations, to identify the extent of significant impacts, and to identify maximum impact locations. A 250-meter resolution coarse receptor grid was developed and extended outwards at least 10 km (or more as necessary to calculate the significant impact area). For the full impact analyses, a nested grid was developed to fully represent the maximum impact area(s). This grid has 25-meter resolution along the facility fence-line in a single tier of receptors composed of four segments extending out to 100 meters from the fenceline, 100-meter resolution from 100 meters to 1,000 meters from the fenceline, and 250-meter spacing out to at least 10 km from the most distant source modeled, not to exceed 50 km from the project site. Additional refined receptor grids with 25-meter resolution were placed around the maximum first-high and maximum second-high coarse grid impacts and extended out 1,000 meters in all directions. Concentrations within the facility fenceline were not calculated. To simplify post-processing requirements, the PSD analyses did not include the receptor locations at which the significant impact levels were not exceeded for subject pollutants.

The regions imported in Geographical Coordinates for the USGS National Elevation Dataset (NED) data are bounded as follows:

> South West corner: UTM Zone 11 (NAD 83) 356,500.0 m, 3,741,600.0 m; and
> North East corner: UTM Zone 11 (NAD 83) 379,800.0 m, 3,764,700.0 m.

3.1.4.11 Meteorological Data Selection

The District provided a 5-year meteorological dataset (2005 through 2009) already processed by AERMET to generate AERMOD-compatible meteorological data for air dispersion modeling. The surface meteorological data were recorded at the District's LAX Airport monitoring station, and the upper air data were recorded at the MCAS Miramar (No. 03190). EPA defines the term "on-site data" to mean data that would be representative of atmospheric dispersion conditions at the source and at locations where the source may have a significant impact on air quality. Representativeness has been defined in the PSD Monitoring Guideline as data that characterize the air quality for the general area in which the proposed project would be constructed and operated. The meteorological data requirement originates in the Clean Air Act at Section 165(e)(1), which requires an analysis "of the ambient air quality at the proposed site and in areas which may be affected by emissions from such facility for each pollutant subject to regulation under [the Act] which will be emitted from such facility."

This requirement and EPA's guidance on the use of on-site monitoring data are also outlined in the *On-Site Meteorological Program Guidance for Regulatory Modeling Applications*.[4] The representativeness of the data depends on (a) the proximity of the meteorological monitoring site to the area under consideration, (b) the complexity of the topography of the area, (c) the exposure of the meteorological sensors, and (d) the period of time during which the data are collected. The District has determined, and the project owner concurs, that the District's LAX meteorological data are representative of conditions at the project site.

Representativeness is best evaluated when sites are climatologically similar, as are the project site and the LAX meteorological monitoring station. The LAX International meteorological monitoring station is in close proximity to the proposed project site (distance between the two locations is approximately 5 km with no significant intervening terrain features), and the same large-scale topographic features located to the east and north that influence the meteorological data monitoring station also influence the proposed project site in the same manner.

Upper air meteorological data are taken from soundings obtained at the Marine Corps Air Station at Miramar, California. No other upper air meteorological monitoring stations are located in the South Coast Air Basin. The next closest upper air station in California is located at Oakland International Airport.

3.1.4.12 Ambient Background Data Selection

Background ambient air quality data for the project area from the monitoring site most representative of the conditions that exist at the proposed project site were used to represent regional background concentrations. The District has determined that the LAX monitoring station provides the most representative ambient air quality background data for PM_{10}, NO_2, SO_2, O_3, and CO. The North Long Beach Station is the nearest for $PM_{2.5}$ observations.

The District has selected the 3-year period 2009–2011 for use in demonstrating compliance with District requirements; the same 3-year period is used to address CEC requirements.

Processed data files were obtained from the District. Data for periods of time with invalid data were replaced by the District using data substitution procedures consistent with EPA guidance. Data substitution ensures that there will be no gaps in the data. This will prevent exclusion of modeled high impact hours because of missing monitoring data.

[4] EPA, *Supplement A to the Guideline on Air Quality Models (Revised)*, 1987.

3.1.4.13 Construction Impacts

Section 3.1.4.1 describes the development of project emissions estimates over the planned 20-month construction period. An Excel workbook was created to estimate pollutant emissions from construction activities. Emissions from worker commuter trips to and from the project site and heavy trucks delivering materials to and from the site during specific construction activities were also included (see Appendix 3.1D).

Worst-case modeling was conducted for short-term averaging times using all combustion emissions from all construction equipment from Month 19 and dust emissions from activities in Month 6 (see Tables 3.1-13 and 3.1-14). Annual emissions were based on Months 4–15.

Based on information provided by the engineering design contractor and the emission estimates in Appendix 3.1D, the peak month in terms of air pollutant emissions is expected to be the 19th month of construction. All construction activities were assumed to occur during an 8-hour work day. The annual emissions were modeled for Months 4–15 after a determination that this consecutive 12-month period will have a higher level of construction activity, as well as higher exhaust and dust emissions, than any other over the entire construction period. The modeling was performed with no downwash. The emission sources for the construction site were grouped into two categories: exhaust emissions and construction dust emissions. The exhaust and construction dust emissions were modeled as four volume sources with a vertical dimension of 6 meters.

The PVMRM option of AERMOD was used to account for the role of ambient ozone levels on the atmospheric conversion rate of NOx emissions (initially mostly in the form of nitric oxide) to NO_2 (the pollutant addressed by ambient standards). Hourly ozone measurements at the LAX Airport monitoring station during the same three years of the meteorological input data set were used to support the PVMRM calculations.

Modeling results are shown in Table 3.1-22.

TABLE 3.1-22
Modeled Maximum Impacts During Construction

Pollutant	Averaging Period	Maximum Predicted Impact (μg/m^3)	Maximum Background Concentration (μg/m^3)	Total Concentration[a] (μg/m^3)	NAAQS (μg/m^3)	CAAQS (μg/m^3)
NO_2	1-hr	225.7	184.2	276.4[b]	—	339
	Fed. 1-hour	225.7	129.7[b]	263.5[d]	188	—
	Annual	28.2	24.5	52.7	100	57
SO_2	1-hr	1.3	67.6	68.9	196	655
	3-hr	0.9	41.6	42.5	1300	—
	24-hr	0.4	15.8	16.2	—	105
CO	1-hr	707	3,250	3,957	40,000	23,000
	8-hr	339	2,433	2,772	10,000	20.000
PM_{10}	24-hr	19	52	71	150	50
	Annual	3.6	25.6	29.2	—	20
$PM_{2.5}$	24-hr		30	50.1	35	—
	Annual		12.8	16.0	12.0	12

[a]The total concentration shown in this table is the sum of the maximum predicted impact and the maximum measured background concentration. Because the maximum impact will not occur at the same time as the maximum background concentration, the actual maximum combined impact will be lower.

[b]Background concentration for Federal 1-hour standard is 3-year average of 98th percentile of daily maximum 1-hour average concentration.

[c]Total Concentration for 1-hr NO_2 is the highest value of the sum of the modeled impact plus the corresponding ambient background concentration for that time of day.

[d]Total concentration for Fed. 1-hour NOx is the highest eight-highest value of the daily maximum of the sum of the modeled impact plus the corresponding ambient background concentration for that time of day.

Because the federal one-hour NO_2 standard and federal 24-hour $PM_{2.5}$ standard are statistically-based, and require averaging the concentrations over three years, the NO_2 impacts during the single year of construction would not be likely to cause a new violation of the federal one-hour NO_2 standard. Because construction is expected to last only 20 months, construction impacts would be much lower during the second year and zero during the third year of a compliance assessment with the federal one-hour NO_2 standard.

Table 3.1-22 shows that worst-case background concentrations of PM_{10} are already above the state standards. Table 3.1-22 also shows that worst-case background concentrations of $PM_{2.5}$ are already above the state and federal annual standards.

The project's construction emissions will result in potentially significant impacts for PM_{10} and $PM_{2.5}$. Mitigation measures to be used to minimize emissions during construction are described in detail in Appendix 3.1D. As discussed in Section 3.1.7, emission offsets will be provided prior to the commencement of construction that will fully mitigate these impacts.

Table 3.1-22 shows that construction emissions will not cause new exceedances of any other state or federal air quality standards.

3.1.4.14 Commissioning Impacts

Air quality impacts during the commissioning period were determined using the emission rates in Appendix 3.1E. One-hour average NO_2 impacts during commissioning were modeled using AERMOD_PVMRM and concurrent LAX ozone data. Modeled impacts are shown in Table 3.1-23.

TABLE 3.1-23
Modeled Maximum Impacts During Commissioning

Pollutant	Averaging Period	Maximum Predicted Impact (µg/m^3)	Background Concentration (µg/m^3)	Total Concentration[a] (µg/m^3)	NAAQS (µg/m^3)	CAAQS (µg/m^3)
NO_2	1-hr	66.1	184.2	250.3	—	339
	Fed. 1-hour	[b]	129.7[d]	—	188	—
	Annual	[c]	24.5	—	100	57
SO_2	1-hr	[c]	67.6	—	196	655
	3-hr		41.6	—	1300	—
	24-hr		15.8	—	—	105
CO	1-hr	797.4	3,250	4,047	40,000	23,000
	8-hr	654.9	2,433	3,088	10,000	20.000
PM_{10}	24-hr	1.8	52	54	150	50
	Annual	[c]	25.6	—	—	NA
$PM_{2.5}$	24-hr	1.8	30	32	35	—
	Annual	[c]	12.8	—	NA	NA

[a]The total concentration shown in this table is the sum of the maximum predicted impact and the maximum measured background concentration. Because the maximum impact will not occur at the same time as the maximum background concentration, the actual maximum combined impact will be lower.

[b]Not applicable, because commissioning is a once in a lifetime event and is thus not applicable to the form of the 1-hr NO2 NAAQS.

[c]Not applicable, because emissions for this pollutant/averaging period are not elevated above normal levels during commissioning.

[d]Background concentration for Federal 1-hour standard is 3-year average of 98th percentile of daily maximum 1-hour average concentration.

Table 3.1-23 shows that commissioning emissions will not cause new exceedances of any state or federal air quality standards (because commissioning is a temporary activity lasting a few weeks at most, the annual standards are not applicable). The table shows that worst-case background concentrations of PM_{10} are already above the state standard, although they are below the federal standard. However, the project's 24-hour PM_{10} impacts are lower than the federal significance threshold of 5 µg/m^3 (see Table 3.1-12). This means that the project's commissioning emissions will not contribute significantly to existing concentrations.

The project's commissioning emissions will not result in potentially significant air quality impacts.

3.1.4.15 Normal Operations Impact Analysis

Screening Modeling Analysis

To ensure the impacts analyzed were for maximum emission levels and worst-case dispersion conditions, a screening procedure was used to determine the inputs to the impact modeling for the new gas turbines. The screening procedure is used to identify the CTG operating conditions that would result in the maximum impacts on a pollutant-specific basis. The operating conditions examined in this screening analysis, along with their exhaust and emission characteristics, are shown in Appendix 3.1B, Table 3.1B-1. These operating conditions represent CTG operation at maximum, average, and minimum ambient temperatures, and at full load and minimum load (50 percent).

Ambient impacts for each of the operating cases were modeled using EPA's AERMOD model and three years of meteorological data, as described above. The results of the unit impact analysis are presented in Appendix 3.1B, Table 3.1B-2. The analysis showed that, except for PM_{10}, impacts for all pollutants and averaging periods were highest under cold temperature, peak load operating conditions for the GE turbine, and mild temperature, base load operating conditions for the Trent turbines; for PM_{10}, impacts were highest under cold temperature, low load operating conditions for the GE turbine, and under hot temperature, low load conditions for the Trent turbines.

Refined Analysis

The screening modeling analysis described above was used to determine which CTG operating parameters (emission rates and stack parameters) would be used in the subsequent refined analyses. Maximum modeled impacts from the gas turbines occur under different meteorological conditions and thus the worst-case conditions for both turbine types cannot occur simultaneously. However, the refined analysis assumed worst-case ambient conditions for both turbine types to ensure that the analysis was extremely conservative.

The techniques used in modeling one-hour average NO_2 concentrations were described in detail in the modeling protocol (See Appendix 3.1C) and as refined through additional conversations with and comments from the District staff. Compliance with the federal one-hour average NO_2 standard is demonstrated using Tier 9 of the options described in the protocol: the five-year average of the sum of the modeled 98^{th} percentile value for each year and the Seasonal Hour-Of-Day (defined as the three-year average of the third-highest concentrations for each hour of the day and season). The seasonal hour-of-day values were provided by the District.

NO_2/NOx ratios for the gas turbines were also reviewed and approved by the District. The ratios and their sources are summarized below in Table 3.1-24.

TABLE 3.1-24
NO_2/NOx Ratios Used in Refined Modeling

Unit(s)	Operating Condition	NO_2/NOx Ratio	Reference
GE turbine (Unit 9)	Normal	0.30	GE
	startup/commissioning	0.45	
Trent turbines (Units 11 and 12)	Normal	0.13	EPA's approved ratio for the Pio Pico Energy Center
	startup/commissioning	0.24	

Listed below are the operating assumptions used in developing the stack parameters and emission rates for each emissions unit and averaging period for the refined modeling analysis.

1-hour, 3-hour, 24-hour and annual averages (except PM_{10}/$PM_{2.5}$)

- GE turbine at peak load, cold temperature; Trent turbines at base load, mild temperature
- Auxiliary boiler in operation at 25% load, annual averaging period only

24-hour and annual averages, PM_{10}/$PM_{2.5}$

- GE turbine at low load, cold temperature; Trent turbines at low load, hot temperature
- Auxiliary boiler in operation at 25% load, annual averaging period only

Because the gas turbines are expected to start up frequently, normal one-hour average operation was modeled assuming that one or more gas turbines would be in startup. Three startup scenarios were evaluated for the one-hour averaging period: Unit 9 in startup and Units 11 and 12 in normal operation; Units 11 and 12 in startup with Unit 9 in normal operation; and all three units in startup. The 8-hour averaging period was assumed to include one hour of startup for each of the three new gas turbines. Emission rates used for this scenario were based on expected maximum NOx and CO emission rates during gas turbine startups and shutdowns. Gas turbine exhaust parameters for minimum load operation were used to characterize gas turbine exhaust during startups/shutdowns. The modeling inputs used for this analysis are shown in Appendix 3.1B, Table 3.1B-3. The results of this analysis are shown below in Table 3.1-25.

TABLE 3.1-25
Modeling Results for New Units (μg/m^3)

Pollutant	Averaging Period	Normal Operation	Fumigation–Inversion	Fumigation–Shoreline	Commissioning
NO_2	1-hr	25.1[a]	2.7	16.9	66.1
	98th percentile	23.1[a]	—	—	[d]
	Annual	0.5	[b]	[b]	[c]
SO_2	1-hr	1.2	1.0	4.5	
	3-hr	0.8	0.9	2.3	[c]
	24-hr	0.3	0.4	0.4	
CO	1-hr	109.0[a]	2.0	12.4	797.4
	8-hr	12.2[a]	1.3	2.6	654.9
PM_{10}/$PM_{2.5}$	24-hr	1.2	1.1	1.4	1.8
	Annual	0.3	[b]	[b]	[c]

[a]One-hour average NO_2 and CO and 8-hour average CO reflect startup impacts.

[b]Not applicable, because inversion breakup is a short-term phenomenon and as such is evaluated only for short-term averaging periods.

[c]Not applicable, because emissions are not elevated above normal levels during commissioning for this pollutant/averaging period.

[d]Commissioning not included in evaluation of compliance with federal 1-hour standard because commissioning is a once in a lifetime event and is thus not applicable to the form of the 1-hr NO_2 NAAQS.

3.1.4.16 Specialized Modeling Analyses.

Fumigation Modeling. Fumigation occurs when a stable layer of air lies a short distance above the release point of a plume and unstable air lies below. Under these conditions, an exhaust plume may be drawn to the ground, causing high ground-level pollutant concentrations. Although fumigation conditions rarely last as long as one hour, relatively high ground-level concentrations may be reached during that time. For this analysis, fumigation was assumed to occur for up to 90 minutes, per EPA guidance.

The SCREEN3 model was used to evaluate maximum ground-level concentrations for short-term averaging periods (24 hours or less). Although this modeling analysis is not required by SCAQMD regulations, guidance from the EPA was followed in evaluating fumigation impacts. The results of this analysis are shown in Table 3.1-25. The modeling files for this analysis are included in the modeling CD.

Gas Turbine Commissioning. There are several high-emissions scenarios possible during the gas turbine commissioning period. Maximum hourly emissions occur during the period prior to oxidation catalyst/SCR system installation, when the combustor is being tuned. During this commissioning phase, NOx emissions will be high because the SCR system is not installed/functioning and because the combustor will not be tuned for optimum performance. CO emissions will also be high because the oxidation catalyst system is not installed/functioning and because the combustor performance will not be optimized. Commissioning activities and expected emissions are shown in detail in Appendix 3.1E. Gas turbine exhaust parameters for minimum load operation were used to characterize gas turbine exhaust during commissioning activities. The maximum hourly NOx and CO emission rates during the commissioning period were also used for this modeling analysis. It was assumed that any auxiliary boiler operation during the highest-emitting gas turbine commissioning activities would be minimal so the auxiliary boiler is not included in the impact assessment for commissioning. The modeling inputs used for this analysis are shown in Appendix 3.1B, Table 3.1B-4. The results of this analysis are shown in Table 3.1-25. The modeling files for this analysis are included in the modeling CD.

Results of the Ambient Air Quality Modeling Analyses for New Units. The maximum impacts for the new gas turbines and auxiliary boiler—calculated from the refined, fumigation, startup/shutdown, and commissioning modeling analyses described above—are summarized in Table 3.1-25. The modeling files for this analysis are included in the modeling CD.

Results of the Ambient Air Quality Modeling Analyses for Entire Facility. The maximum impacts for the new gas turbines and auxiliary boiler, along with the maximum impacts for the gas turbine Units 5 and 7, are summarized in Table 3.1-26. Maximum impacts for all pollutants occur under commissioning conditions. However, commissioning is not included in the evaluation of compliance with the federal 1-hour NO_2 standard because that standard is based on a three-year averaging period and commissioning will not continue for three years.

The modeling inputs used to characterize the emissions from Units 5 and 7 under normal operating conditions and under startup conditions are shown in Appendix 3.1B, Tables 3.1B-5 and 3.1B-6, respectively. The modeling files for this analysis are included in the modeling CD.

TABLE 3.1-26
Modeling Results for Entire Facility (µg/m^3)

		Maximum Modeled Concentration, µg/m^3		
Pollutant	**Averaging Period**	**Units 9, 11 and 12**	**Units 5 and 7**	**All Units**
NO_2	1-hr	66.1[a]	21.0[c]	67.3[d]
	98th percentile	23.1[c]	17.9[c]	63.9[c]
	Annual	0.5	0.1	0.6
SO_2	1-hr	4.5[b]	3.1[b]	7.5[b]
	3-hr	2.3[b]	0.8[b]	3.1[b]
	24-hr	0.4[b]	0.1[b]	0.5[b]
CO	1-hr	797.5[a]	51.5[c]	849.0[d]
	8-hr	654.9[a]	37.8[c]	692.7[d]
$PM_{10}/PM_{2.5}$	24-hr	1.8[a]	0.4[d]	2.2[d]
	Annual	0.3	0.1	0.4

[a] Maximum impacts occur under commissioning conditions.

[b] Maximum impacts occur under shoreline fumigation conditions.

[c] Reported impacts reflect startup conditions.

[d] Units 9, 11 and 12 in commissioning, Units 5 and 7 in startup. No auxiliary boiler operation assumed; see text.

Ambient Air Quality Impact Analyses for New Units and Entire Facility. To determine a project's air quality impacts, the modeled concentrations are added to the maximum background ambient air concentrations and then compared to the applicable ambient air quality standards. To determine the background ambient air concentrations for a project site, it is necessary to review data collected at nearby monitoring stations. Background ambient air quality data for the project area from the monitoring site most representative of the conditions that exist at the proposed project site were used to represent regional background concentrations. The District has approved the use of background data from the LAX monitoring station (Westchester Parkway) as representative of background ambient air quality for PM_{10}, NO_2, SO_2 and CO in the project area. The North Long Beach Station is the nearest representative monitoring station for $PM_{2.5}$ observations.

The District has approved the three-year period 2009-2011 for use in demonstrating compliance with District requirements; the same 3-year period is used to address CEC requirements. Maximum monitored background concentrations for each year and over the three-year period are summarized in Table 3.1-27.

TABLE 3.1-27
Maximum Background Concentrations, 2009 – 2011 (µg/m³)

Pollutant	Averaging Period	2009	2010	2011	Maximum
NO_2[a]	1-hour	144.8	142.9	184.2	184.2
	Fed. 1-hour[c]	129.7	114.7	122.2	129.7
	Annual	—	22.6	24.5	24.5
SO_2[a]	1-hour	57.2	67.6	31.2	67.6
	Fed. 1-hour[d]	31.2	41.6	20.8	41.6
	24-hour	15.8	10.5	5.3	15.8
CO[a]	1-hour	3,250	3,250	2,875	3,250
	8-hour	2,211	2,433	3,377	2,433
PM10[a]	24-hour	52	37	41	52
	Annual	25.6	20.6	21.7	25.6
PM2.5[b]	24-hour[e]	34	28	28	30
	Annual	12.8	10.4	11.3	12.8

[a]LAX (Westchester Parkway) monitoring station.

[b]North Long Beach monitoring station.

[c] Federal 1-hour NO_2 is shown as the 98th percentile as that is the basis of the federal standard.

[d] Federal 1-hour SO_2 is shown as the 99th percentile as that is the basis of the federal standard.

[e]$PM_{2.5}$ 24-hr average concentrations shown are 98th percentile values rather than highest values because compliance with the standard is based on 98th percentile readings. Maximum value is 3-year average of the 98th percentile values.

Source: Background concentration data obtained from CARB ADAM Air Quality Data Statistics (*http://www.arb.ca.gov/adam/welcome.html*) and EPA AirData (*http://www.epa.gov/airdata/ad_rep_mon.html*)

Maximum ground-level impacts due to operation of the new gas turbines and auxiliary boiler were shown above in Table 3.1-27. These maximum modeled concentrations are combined with background ambient concentrations and compared with the state and federal ambient air quality standards in Table 3.1-28. The results indicate that the proposed new units will not cause or contribute to violations of any state or federal air quality standards, with the exception of the state PM_{10} standard and state and federal $PM_{2.5}$ standards. For these pollutants, existing concentrations already exceed the applicable standards.

TABLE 3.1-28
Modeled Maximum Impacts for New Units ($\mu g/m^3$)

Pollutant	Averaging Period	Maximum Impact	Background	Total Impact	State Standard	Federal Standard
NO_2	1-hr	66.1[a]	184.2	250.3	339	—
	98th percentile	23.1[c]	109.6[c]	120.7[f]	—	188
	Annual	0.5	24.5	25.0	57	100
SO_2	1-hr	4.5[b]	67.6	72.1	655	196
	3-hr	2.3[b]	67.6[d]	69.9	—	1300
	24-hr	0.4[b]	15.8	16.2	105	—
CO	1-hr	797.5[a]	3,250	4,048	23,000	40,000
	8-hr	654.9[a]	2,433	3,088	10,000	10,000
PM_{10}	24-hr[e]	1.8[a]	52	53.8	50	150
	Annual	0.3	25.6	25.9	20	—
$PM_{2.5}$	24-hr	1.8[a]	30[e]	31.8	—	35
	Annual	0.3	12.8	13.1	12	12.0

[a]Maximum impacts occur under commissioning conditions.

[b]Maximum impacts occur under fumigation conditions.

[c]Maximum impacts occur under startup conditions; background value is seasonal hour-of-day. See text.

[d]CARB no longer publishes 3-hour average SO_2 concentrations, so 1-hour average background is used as conservative estimate of 3-hour average background.

[e]Background concentration reflects 3-year average of the 98th percentile values based on form of standard. See 3.1-28

[f]Total impact is the five-year average of the sum of the modeled 98th percentile value for each year and the Seasonal Hour-Of-Day background (defined as the three-year average of the third-highest concentrations for each hour of the day and season), so values do not add directly.

Maximum ground-level impacts due to operation of the new units (gas turbine Units 9, 11 and 12 and the auxiliary boiler) in combination with gas turbine Units 5 and 7 are shown in Table 3.1-26. As with the analysis above, these maximum modeled concentrations are combined with background ambient concentrations and compared with the state and federal ambient air quality standards in Table 3.1-29. The results indicate that the proposed project will not cause or contribute to violations of any state or federal air quality standards, with the exception of the state PM_{10} standard and state and federal $PM_{2.5}$ standards. For these pollutants, existing concentrations already exceed the applicable standards.

TABLE 3.1-29
Modeled Maximum Impact for Entire Facility (μg/m^3)

Pollutant	Averaging Period	Maximum Impact	Background	Total Impact	State Standard	Federal Standard
NO_2	1-hr	67.3[a]	184.2	252.0	339	—
	98th percentile	63.9[b]	129.7	150.6	—	188
	Annual	0.6	24.5	25.1	57	100
SO_2	1-hr	7.5[c]	67.6	75.1	655	196
	3-hr	3.1[c]	67.6[d]	70.7	—	1300
	24-hr	0.5[c]	15.8	16.3	105	—
CO	1-hr	849.0[a]	3,250	4,099	23,000	40,000
	8-hr	692.7[a]	2,433	3,126	10,000	10,000
PM_{10}	24-hr[e]	2.2[a]	52	54.2	50	150
	Annual	0.4	25.6	26.0	20	—
$PM_{2.5}$	24-hr	2.2[a]	30[e]	32.2	—	35
	Annual	0.4	12.8	13.2	12	12

[a] Units 9, 11 and 12 in commissioning, Units 5 and 7 in startup. No auxiliary boiler operation assumed; see text.

[b] Reported impacts reflect startup conditions.

[c] Maximum impacts occur under shoreline fumigation conditions.

[d] CARB no longer publishes 3-hour average SO_2 concentrations, so 1-hour average background is used as conservative estimate of 3-hour average background.

[e] Background concentration reflects 3-year average of the 98th percentile values based on form of standard. See 3.1-28.

Additional Requirements

Because the project is subject to PSD review for NO_2 and CO (see Table 3.1-32), the project ambient air quality impacts must be below the PSD significant impact levels and applicable preconstruction monitoring thresholds for these pollutants or an increments analysis and/or preconstruction monitoring may be required. In addition, because PM_{10} background concentrations are above state standards, maximum modeled PM10 impacts from each unit must be below the significant change thresholds in Table A-2 of SCAQMD Rule 1303. Compliance with these additional ambient impact requirements is shown below in Tables 3.1-30 and 3.1-31 below. These results show that the annual NO_2 and all CO emissions impacts are below the PSD SILs and preconstruction monitoring thresholds, and the PM_{10} impacts are below the District significant change thresholds. However, the one-hour NO_2 impacts exceed the applicable NO_2 PSD SIL, so an increments analysis will be required. A separate protocol will be prepared for the NO_2 increments analysis.

TABLE 3.1-30
Comparison of Modeled Maximum Project Impacts with PSD SILS and Preconstruction Monitoring Thresholds (μg/m^3)

Pollutant	Averaging Period	Maximum Impact	PSD SIL	PSD Preconstruction Monitoring Threshold
NO_2	1-hr	23.1*	7.5	n/a
	Annual	0.5	1.0	14
CO	1-hr	109.0	2000	n/a
	8-hr	12.2	500	575

*Reported results reflect startup conditions.

TABLE 3.1-31
Comparison of Modeled Project Impacts with District Significant Change Thresholds ($\mu g/m^3$)

Equipment	24-hour Average PM_{10} Concentration	24-hour Average PM_{10} Significance Level	Annual PM_{10} Concentration	Annual PM_{10} Significance Level	Compliance (Yes/No)
Unit 9	0.79*	2.5	0.23	1.0	Yes
Unit 11	0.66*	2.5	0.24	1.0	Yes
Unit 12	0.66*	2.5	0.24	1.0	Yes
Auxiliary Boiler	0.3	2.5	0.09	1.0	Yes

*Maximum impacts occur under commissioning conditions.

3.1.5 Cumulative Air Quality Impacts

Two types of cumulative air quality impact analyses are often conducted in association with power plant projects: a CEQA analysis and a PSD analysis.

A CEQA cumulative impacts analysis examines potential cumulative air quality impacts that may result from the project and other reasonably foreseeable projects. Such an analysis is generally required only when project impacts are significant. To ensure that potential cumulative impacts of the project and other nearby projects are adequately considered, a cumulative impacts analysis has been conducted in accordance with the protocol included as Appendix 3.1C. The analysis demonstrates that the project will not cause or contribute to any significant cumulative air quality impacts.

The second type of cumulative impact analysis is part of the PSD review process, and is designed to ensure that industrial facilities that have the potential to cause locally elevated concentrations of air contaminants are adequately considered when determining the project's potential to cause or contribute to a violation of a federal air quality standard.

3.1.5.1 Nearby Sources

3.1.5.1.1 CEQA Cumulative Impacts Analysis

The CEC requires an analysis to determine the cumulative impacts of the project and other projects within a 6-mile radius that have received construction permits, but are not yet operational or that are in the permitting process or can be expected to be so in the near future. The District provided a list of such projects (see Appendix 3.1H).

The District's Facility Information Detail (FIND) database was used to identify additional information about the nearby projects on the District's list. All of the projects listed by the District were eliminated from further review for one or more of the reasons listed below.

- Source emissions of both NOx and PM below 5 TPY
- Project was change of ownership
- Project was administrative
- Project was change of conditions—associated emission increase below 5 TPY

3.1.5.1.2 PSD Cumulative Analysis

The project's impact area (the geographical area where modeling indicates that project impacts may exceed the NOx SIL of 7.5 µg/cu m) is a small, nearly circular area 1.5 km in radius centered on the turbine stacks. Half this circle is in the ocean; the other half extends halfway into the neighboring refinery (encompassing the tank farm, and just reaching the process units 1.5 km to the east); and just extending to include the Scattergood Generating Station.

Because of the size of the compliance margin (the difference between the facility impact, as shown in Table 3.1-29, and the federal standard), the impact gradient of the Scattergood Generating Station within the ESPFM's impact area is not expected to be significant enough to justify cumulative modeling.

3.1.5.2 Regional Impacts

Regional impacts are evaluated by assessing the project's contribution to regional emissions. Although the relative importance of VOC and NOx emissions in ozone formation differs from region to region and from day to day, state law requires reductions in emissions of both precursors to reduce overall ozone levels. The change in the sum of emissions of these pollutants, equally weighted, provides a rough estimate of the impact of the project on regional ozone levels. Similarly, a comparison of the emissions of PM_{10} and $PM_{2.5}$ precursor emissions from the project with regional PM_{10} and $PM_{2.5}$ precursor emissions provides an estimate of the impact of the project on regional PM_{10} and $PM_{2.5}$ levels.

Table 3.1-32 summarizes these comparisons. The project's emissions are compared with regional emissions in 2010. South Coast Air Basin emissions projections for 2010 were taken from CARB's web-based emission inventory projection software.

TABLE 3.1-32
Comparison of Project Emissions to Regional Precursor Emissions in 2010: Annual Basis*

Ozone Precursors – Annual Basis	
Total South Coast Air Basin Ozone Precursors, tons/year	522,388
Total Project Ozone Precursor Emission, tons/year	127
Ratio of Project to Basin Ozone Precursor Emissions	0.0002
PM_{10} Precursors – Annual Basis	
Total South Coast Air Basin PM_{10} Precursors, tons/year	416,210
Total Project PM_{10} Precursor Emissions, tons/year	151
Ratio of Project to Basin PM_{10} Precursor Emissions	0.0004
$PM_{2.5}$ Precursors – Annual Basis	
Total South Coast Air Basin $PM_{2.5}$ Precursors, tons/year	350,327
Total Project $PM_{2.5}$ Precursor Emissions, tons/year	151
Ratio of Project to Basin $PM_{2.5}$ Precursor Emissions	0.0004

*Basin-wide emissions calculated as 365 times daily emissions

3.1.5.3 Greenhouse Gas Cumulative Effects Analysis

In the absence of established thresholds of significance or methodologies for assessing impacts, this analysis of GHG emission impacts consists of quantifying project-related GHG emissions, determining their significance in comparison to the goals of AB 32, and discussing the potential impacts of climate change within the state as well as strategies for minimizing those impacts.

As the CEC's 2009 Integrated Energy Policy Report[5] noted:

> *The Energy Commission's 'Framework for Evaluating Greenhouse Gas Implications of Natural Gas-Fired Power Plants in California' found that as California's integrated electricity system evolves to meet GHG emissions reduction targets, the operational characteristics associated with increasing renewable generation will increase the need for flexible generation to maintain grid reliability. The report asserts that natural gas-fired power plants are generally well-suited for this role and that California cannot simply replace all natural gas fired power plants with renewable energy without endangering the safety and reliability of the electric system. The report acknowledges that California will need to modernize its natural gas generating fleet to reduce environmental impacts, however. Overall, the report found that the future*

[5] CEC-100-2009-003-CMF, December 5, 2007, accessed at http://www.energy.ca.gov/2009publications/CEC-100-2009-003/CEC-100-2009-003-CMF.PDF

of natural gas plants will likely fill five auxiliary roles: 1) intermittent generation support, 2) local capacity requirements, 3) grid operations support, 4) extreme load and system emergencies support, and 5) general energy support. The question remains as to the quantity, type, and location of natural gas-fired generation to fill remaining electricity needs once preferred resource targets are achieved. (p. 110)

Most renewable energy facilities such as wind and solar are "intermittent resources," meaning these resources are not available to generate in all hours and thus have limited operating capacity. For example, intermittent resources can be limited by meteorological conditions on an hourly, daily, and seasonal basis. Further, most renewable resources have no ability to provide regulation—the ability to ramp up and down quickly at the system operator's direction to ensure electric system reliability. In addition, the availability of intermittent resources is often unrelated to the load profile they serve. For example, some photovoltaic resources reach peak production around 12:00 noon, while the electrical demand sometimes peaks between 5:00 p.m. and 7:00 p.m.

"Firming" involves the use of fast-starting, flexible generation that is always available under all operating conditions to ramp up or ramp down, as necessary, to balance load and generation. Firming power is the cornerstone of system reliability. Thus, in the context of the California Environmental Quality Act, the CEC's Integrated Energy Policy Report, and other state GHG policy documents, the project would not be expected to cause a significant cumulative impact with respect to GHGs. Instead, the project supports the State's strategy to reduce fuel use and GHG emissions. Furthermore, even though it is possible to quantify how many gross GHG emissions are attributable to a project, the displacement by the project of emissions from less efficient generating resources makes it difficult to determine whether this will result in a net increase of these emissions, and, if so, by how much. Therefore, it would be speculative to conclude that any given project results in a cumulatively significant adverse impact resulting from GHG emissions.

The project can be operated without the limitations affecting intermittent renewable resources. The project will provide fast-starting, flexible generating resources that will supplement and support intermittent renewable resources without affecting electric system reliability. Accordingly, as a fast-starting, flexible generating resource, ESPFM will enhance the reliability of existing and future intermittent renewable resources and thus further California's RPS and GHG goals.

As directed by SB 97, the Resources Agency adopted Amendments to the CEQA Guidelines for greenhouse gas emissions (GHG CEQA Guidance) on December 30, 2009. On March 18, 2010, those amendments became effective.

The GHG CEQA Guidance included the following elements:

- Quantification of GHG emissions;
- Determination of whether the project may increase or decrease GHG emissions as compared to existing environmental setting;
- Determination of whether the project emissions exceed a threshold of significance determined by the lead agency;
- The extent to which the project complies with state, regional, or local plans for reduction or mitigation of GHGs; and
- Mitigation measures.

Certain GHG reduction strategies will require increases in natural gas consumption; for example, some fraction of electric generation from coal-fired power plants will need to be replaced by natural gas fired generation. As the 2007 IEPR and a 2009 CEC Siting Committee Report[6] acknowledged, "new gas-fired power plants are more efficient than older power plants, and they displace these older facilities in the dispatch order." The CEC's 2009

[6] CEC-700-2009-004, "Committee Guidance on Fulfilling California Environmental Quality Act Responsibilities for Greenhouse Gas Impacts In Power Plant Siting Applications," March 2009.

Framework report[7] further discussed the role of new gas-fired power plants in displacing GHG emissions, and furthering the State's efforts to reduce GHG emissions. The 2009 Framework report concludes that as California expands renewable energy generation to achieve its GHG emissions reduction goals, it cannot simply retire natural-gas fired power plants: rather, new natural-gas fired power plants may be needed.

Net GHG emissions for the integrated electric system will decline when new gas-fired power plants are added that (1) serve load growth or capacity needs more efficiently than the existing fleet; (2) improve the overall efficiency of the electric system; and/or (3) permit increased penetration of renewable generation.[8] Because of its location and operational characteristics, ESPFM will contribute to the reduction of GHG emissions because it will achieve all of these goals.

In the Presiding Member's Proposed Decision for the Avenal Energy Project (CEC-800-2009-006-PMPD), the Committee has established a three-part test to ensure that new natural gas fired power plants approved by the CEC will support the goals and policies of AB 32 and the related parts of California's GHG framework. The elements of this test are listed below.

(1) The project must not increase the overall system heat rate for natural gas plants.
(2) The project must not interfere with generation from existing renewable facilities nor with the integration of new renewable generation.
(3) Taking into account the factors listed in (1) and (2), the project must reduce system-wide GHG emissions and support the goals and policies of AB 32.

As a fast-starting, highly efficient facility, ESPFM will meet all three of these criteria. The proposed combined cycle unit would have a net heat rate of approximately 7,670 Btu/kWh (HHV), which leads to an estimated GHG emission rate of 0.407 MT CO_2/MWh. The project's capability for fast response will provide firming capability that will support the integration of new renewable generation. By displacing older, less efficient units, the project will reduce system-wide GHG emissions.

3.1.6 Consistency with Laws, Ordinances, Regulations, and Standards

This section considers consistency separately for federal, state, and local requirements.

3.1.6.1 Consistency with Federal Requirements

3.1.6.1.1 Prevention of Significant Deterioration Program

The PSD requirements apply, on a pollutant-specific basis, to any project that is a new major stationary source or a major modification to an existing major stationary source. A major source is a listed facility (one of 28 PSD source categories listed in the federal Clean Air Act) that emits at least 100 TPY, or any other facility that emits at least 250 TPY. PSD also applies to a stationary source that emits more than 100,000 TPY of greenhouse gases (GHGs). ESGS is an existing major stationary source.

The project will be a major modification because emissions of some pollutants will exceed the PSD significant emission threshold. Table 3.1-33 shows the pollutants that will trigger PSD review.

[7] CEC-700-2009-009, "Framework for Evaluating Greenhouse Gas Implications of Natural Gas-Fired Power Plants in California," May 2009.

[8] Ibid.

TABLE 3.1-33
PSD Significant Emission Thresholds

Pollutant	PSD Significant Emission Threshold (TPY)[a]	Project Emissions (TPY)	Significant? (Y/N)
SO_2	40	6.5	N
PM_{10}	15	51.1	N/A[b]
$PM_{2.5}$	10	51.1	N/A[b]
NO_2	40	93.5	Y
CO	100	176.0	Y
GHGs	75,000	968,000	Y
Lead	0.6	0.0	N

[a]40 CFR 51.165 (a)(1)(xxvii)

[b]The project area is a federal nonattainment area for these pollutants; PSD review does not apply.

PSD permits for major sources in the SCAQMD are issued by the District.

The PSD requirements for the subject pollutants are outlined below.

- Emissions of the PSD pollutants that trigger PSD review (NOx, CO and GHGs) will be controlled using BACT.
- Air quality impacts in combination with other increment-consuming sources must not exceed maximum allowable incremental increases for NO_2.
- Air quality impacts of all sources in the area plus ambient pollutant background levels cannot exceed NAAQS.
- Pre- and/or post-construction air quality monitoring may be required.
- The air quality impacts on soils, vegetation, and nearby PSD Class I areas (specific national parks and wilderness areas) must be evaluated. (Note: The ESGS is located in a Class II area.)

3.1.6.1.2 Nonattainment New Source Review

Nonattainment New Source Review jurisdiction has been delegated to the SCAQMD for all pollutants and is discussed further under local requirement conformance section below.

3.1.6.1.3 National Standards of Performance for New Stationary Sources

Establishes national standards of performance to limit the emissions of criteria pollutants (air pollutants for which EPA has established NAAQS) from new or reconstructed facilities in specific source categories. Applicability of these regulations depends on equipment size, process rate, and date of construction. The proposed project will be subject to Subpart KKKK, Standards of Performance for Stationary Gas Turbines (constructed after February 18, 2005). This new source performance standard applies to gas turbines with a heat input in excess of 1 MMBtu/hr that commence construction after February 18, 2005, and is therefore applicable to the proposed project’s gas turbines. Subpart KKKK limits NOx and SO_2 emissions from new gas turbines based on power output. The limits for gas turbines greater than 30 MW are 0.39 lb NOx per MW-hr and 0.58 lb SO_2 per MW-hr. The emission limits of proposed for this project are well below the Subpart KKKK limits, as shown in Table 3.1-34.

TABLE 3.1-34
Compliance with 40 CFR 60 Subpart KKKK

Pollutant	Proposed Permit Limits			Subpart KKKK Limit, lb/MW-hr
	ppmc	lb/hr	lb/MW-hr (max)	
Unit 9				
SO_2	0.42	5.0	0.017	0.58
NO_2	2.0	17.9	0.058	0.39
Units 11/12				
SO_2	0.42	3.3	0.026	0.58
NO_2	2.5	4.8	0.11	0.39

Compliance with the NSPS limits must be demonstrated through an initial performance test. Because the proposed project's gas turbines will be equipped with a continuous NOx emissions monitor, ongoing annual performance testing will not be required under the NSPS.

These standards are enforced at the local level with federal and state oversight.

3.1.6.1.4 National Emission Standards for Hazardous Air Pollutants

Establishes national emission standards to limit emissions of hazardous air pollutants (HAPs, or air pollutants identified by EPA as causing or contributing to the adverse health effects of air pollution but for which NAAQS have not been established) from facilities in specific source categories. These standards are implemented at the local level with federal oversight. Only 40 CFR 63 Subpart YYYY, the NESHAP for combustion turbines, which limits formaldehyde emissions from turbines located at majors sources of HAPs, is potentially applicable to the proposed project.

The sources added by ESPFM have a PTE of 3.2 TPY of formaldehyde, and 8.4 TPY of total HAPS (see Table 3.1-19). When existing Units 5 and 7 operate after implementation of ESPFM there will be a combined PTE of 4.1 TPY of formaldehyde, and 10.4 TPY of total HAPS (Appendix M, *Application for a Determination of Compliance and Permit to Construct for the El Segundo Power Redevelopment Project* (June 2007). Total post-project emissions of formaldehyde will be 7.3 TPY, and total HAPS will be 18.8 TPY. Therefore, the ESEC is not and will not be, a major source of HAPS and thereforethis NESHAP is not applicable to the proposed ESPFM.

3.1.6.1.5 Acid Rain Program

Requires the monitoring and reporting of emissions of acidic compounds and their precursors from combustion equipment owned by a utility. The principal source of these compounds is the combustion of fossil fuels. Therefore, Title IV established national standards to monitor, record, and, in some cases, limit SO_2 and NOx emissions from electrical power generating facilities. These standards are implemented at the local level with federal oversight. SCAQMD has received delegation authority to implement Title IV. ESPFM will comply with the acid rain program requirements and will file an acid rain permit application in accordance with the deadlines in SCAQMD Regulation XXXI.

3.1.6.1.6 Title V Operating Permits Program

Requires the issuance of operating permits that identify all applicable federal performance, operating, monitoring, recordkeeping, and reporting requirements. Title V applies to major facilities, Phase II acid rain facilities, subject solid waste incinerator facilities, and any facility listed by EPA as requiring a Title V permit. SCAQMD has received delegation authority for this program. An application for an amendment to the facility Title V permit was filed on March 14, 2013.

3.1.6.2 Consistency with State Requirements

As discussed in Section 3.1.3.2, state law established local air pollution control districts and air quality management districts with the principal responsibility for regulating emissions from stationary sources. The proposed project is under the local jurisdiction of the SCAQMD; therefore, compliance with SCAQMD regulations will assure compliance with state air quality requirements.

3.1.6.2.1 California Clean Air Act

AB 2595, the California Clean Air Act (CAA), was enacted by the California Legislature and became law in January 1989. The CAA requires the local air pollution control districts to attain and maintain both the federal and state ambient air quality standards at the "earliest practicable date." The CAA contains several milestones for local districts and CARB. SCAQMD was required to submit to CARB an air quality plan, with updates as necessary, defining the program for meeting the required emission reduction milestones in the South Coast Air Basin.

Air quality plans must demonstrate attainment of the state ambient air quality standards and must result in a five percent annual reduction in emissions of nonattainment pollutants (ozone, PM10, PM2.5, and associated precursors) in a given district (H&SC §40914). A local district may adopt additional stationary source control measures or transportation control measures, revise existing source-specific or new source review rules, or expand its vehicle inspection and maintenance program (H&SC §40918) as part of the plan. District air quality plans specify the development and adoption of more stringent regulations to achieve the requirements of the Act. The applicable regulations that will apply to the project are included in the discussion of District prohibitory rules in Section 3.1.6.3.

3.1.6.2.2 Greenhouse Gas Initiatives

In 2006, California enacted the California Global Warming Solutions Act of 2006 (AB 32). It requires the California Air Resources Board (CARB) to adopt standards that will reduce statewide GHG emissions to statewide GHG emissions levels in 1990, with such reductions to be achieved by 2020. To achieve this, CARB has a mandate to define the 1990 emissions level and achieve the maximum technologically feasible and cost-effective GHG emission reductions.

CARB adopted early action GHG reduction measures in October 2007 and established statewide emissions caps by economic "sectors" in 2008. CARB has adopted rules requiring quantification and reporting of GHG emissions. Finally, CARB has implemented a GHG Cap and Trade program, requiring facilities to purchase and surrender carbon allowances.

SB 1368, also enacted in 2006, and regulations adopted by the CEC and the Public Utilities Commission pursuant to the bill, prohibits utilities from entering into long-term commitments with any baseload facilities that exceed the Emission Performance Standard of 0.50 metric tonnes of CO2 per megawatt-hour (1,100 pounds CO2/MWh). Specifically, the Emission Performance Standard (EPS) applies to base load power from new power plants, new investments in existing power plants, and new or renewed contracts with terms of 5 years or more, including contracts with power plants located outside of California.

The ESPFM CO_2 emission rate of 0.407 MT/MWh would meet the Emission Performance Standard of 0.50 MT/MWh.

GHG Emissions During Project Construction

Construction of the proposed power plant will involve the use of fuel-consuming equipment for construction and transportation and will produce greenhouse gas emissions. GHG emissions during construction are provided in Appendix 3.1D.

These small GHG emissions increases from construction activities will not be significant. The construction period is only about 20 months long, and the emissions will be intermittent during that period. Additionally, the mitigation measures proposed for the project (such as limiting idling times) will minimize GHG emissions during the construction phase of the project.

GHG Emissions During Project Operation

In the absence of established thresholds of significance or methodologies for assessing impacts, this analysis of GHG emission impacts consists of quantifying project-related GHG emissions, determining their significance in comparison to the goals of AB 32, and discussing the potential impacts of climate change within the state as well as strategies for minimizing those impacts.

As the CEC's 2007 Integrated Energy Policy Report noted:

> New natural gas-fueled electricity generation technologies offer efficiency, environmental, and other benefits to California, specifically by reducing the amount of natural gas used—and with less natural gas burned, fewer greenhouse gas emissions. Older combustion and steam turbines use outdated technology that makes them less fuel- and cost-efficient than newer, cleaner plants… The 2003 and 2005 IEPRs noted that the state could help reduce natural gas consumption for electric generation by taking steps to retire older, less efficient natural gas power plants and replace or repower them with new, more efficient power plants. (CEC-100-2007-008-CMF, December 5, 2007, p. 184)

The California Public Utilities Commission (CPUC) and CEC joint recommendations to CARB state that renewable integration will be a "cornerstone" of emission reductions. (*Final Opinion and Recommendation on Greenhous Gas Regulatory Strategies*) Similarly, the CARB AB 32 scoping plan anticipates the implementation of a 33 percent Renewable Portfolio Standard (RPS) and includes the RPS as an emission reduction measure. (CARB, *Final AB 32 Scoping Plan*, Decebmer 2008).

Most renewable energy facilities such as wind and solar are "intermittent resources," meaning these resources are not available to generate in all hours and thus have limited operating capacity. For example, intermittent resources can be limited by meteorological conditions on an hourly, daily, and seasonal basis. Further, most renewable resources have no ability to provide regulation, the ability to ramp up and down quickly at the system operator's direction to ensure electric system reliability. In addition, the availability of intermittent resources is often unrelated to the load profile they serve. For example, some photovoltaic resources reach peak production around 12:00 noon while the electric system typically peaks between 5:00 p.m. and 7:00 p.m.

The proposed turbines can be operated without the limitations affecting intermittent renewable resources. The proposed turbines will provide fast-starting, flexible generating resources that will assist SCE to firm intermittent renewable resources and thus integrate renewable resources into SCE's generation portfolio without affecting electric system reliability. The project will allow SCE to take advantage of renewable resources that are out on the market, but are volatile, from a system operations perspective, and require significant, flexible resources to firm its power for system reliability. Accordingly, as a fast-starting, flexible generating resource, the project will enhance the reliability of existing and future intermittent renewable resources and thus further SCE's RPS and GHG goals.

The project will help provide "firming" sources for SCE's existing and future intermittent renewable resources in support of SCE's RPS and GHG goals. "Firming" involves the use of fast-starting, flexible generation that is always available under all operating conditions to ramp up or ramp down, as necessary, to balance load and generation. Firming power is the cornerstone of system reliability. Thus, in the context of CEQA, the CEC's Integrated Energy Policy Report, and other state GHG policy documents, the project would not be expected to cause a significant cumulative impact. Instead, the project supports the state's strategy to reduce fuel use and GHG emissions. Further, even though it is possible to quantify how many gross GHG emissions are attributable to a project, it is difficult to determine whether this will result in a net increase of these emissions, and, if so, by how much. Therefore, it would be speculative to conclude that any given project results in a cumulatively significant adverse impact resulting from GHG emissions.

At this time, neither the state nor the AQMD has adopted thresholds of significance or methodologies for analyzing GHG emission impacts under CEQA. In the absence of adopted guidelines, projects may be judged on whether they will hinder the emission-reduction goals of AB 32.

Certain GHG reduction strategies will require increases in natural gas consumption; for example, some fraction of electric generation from coal-fired power plants will need to be replaced by natural gas-fired generation. Even though GHG emissions from a specific project can be quantified, it is difficult to determine whether operation of the project itself would result in a net increase or decrease of GHG emissions, much less to quantify the impact. Therefore, it would be speculative to conclude that any particular electricity generation project will result in a cumulatively significant adverse impact resulting from GHG emissions.

3.1.6.3 Consistency with Local Requirements

The SCAQMD has been delegated responsibility for implementing local, state, and federal air quality regulations in the South Coast Air Basin. The proposed project is subject to District regulations that apply to new stationary sources, to the prohibitory regulations that specify emission standards for individual equipment categories, and to the requirements for evaluation of impacts from non-criteria pollutants. Facility compliance with applicable District requirements is evaluated below.

3.1.6.3.1 New Source Review Requirements

The SCAQMD's New Source Review (NSR) rule (Regulation XIII, New Source Review) establishes the criteria for siting new and modified emission sources; this rule is applicable to the proposed project. There are three basic requirements within the NSR rules. First, BACT and Lowest Achievable Emission Rate (LAER) requirements must be applied to any new emission unit with potential emissions above specified threshold quantities. Second, all potential emission increases of nonattainment pollutants or precursors from the proposed source above specified thresholds must be offset by real, quantifiable, surplus, permanent, and enforceable emission decreases in the form of ERCs. Third, an ambient air quality impact analysis must be conducted to confirm that the project does not cause or contribute to a violation of a national or California AAQS or jeopardize public health.

3.1.6.3.2 BACT

A comparison of potential emissions with the BACT thresholds in SCAQMD Rule 1303 is presented in Table 3.1-35. This table shows that the proposed gas turbines are required to use best available control technology (BACT) for NOx, VOC, SO_2 and PM_{10}. Emissions from the proposed auxiliary boiler are below the BACT threshold in the District's NSR rule.

TABLE 3.1-35
Applicability of BACT Requirements Under NSR

Pollutant	BACT Threshold, lb/day	Unit Emissions, lb/day	BACT Required?
Gas Turbine, Unit 9			
NOx	0	559.1	Yes
VOC	0	240.7	Yes
SO_2	0	124.8	Yes
PM_{10}	0	237.5	Yes
Gas Turbines, Units 11 & 12, each			
NOx	0	238.6	Yes
VOC	0	72.9	Yes
SO_2	0	23.9	Yes
PM_{10}	0	120.0	Yes
Auxiliary Boiler			
NOx	0	2.4	Yes
VOC	0	0.9	Yes
SO_2	0	0.4	Yes
PM_{10}	0	1.6	Yes

A detailed BACT analysis was conducted to evaluate available control options for the proposed gas turbines under both PSD and NSR requirements; the analysis is presented in Appendix 3.1F. A summary of the proposed BACT is provided in Table 3.1-36.

TABLE 3.1-36
Summary of Proposed BACT

Pollutant	Control Technology	Concentration
NOx, GE Turbine	Water injection and SCR and non-use of carbon control and capture system (CCS)	2.0 ppmvd @ 15% O_2 (1-hr avg)
NOx, Trent Turbines	Water injection and SCR and non-use of carbon control and capture system (CCS)	2.5 ppmvd @ 15% O_2 (1-hr avg)
NOx, Auxiliary Boiler	Ultra-Low-NOx burner and FGR	9 ppmvd @ 3% O_2 (15-minute avg)
CO, GE Turbine	Catalytic Oxidation	2.0 ppmvd @ 15% O_2 (1-hr avg)
CO, Trent Turbines	Catalytic Oxidation	4.0 ppmvd @ 15% O_2 (1-hr avg)
CO, Auxiliary Boiler	Good combustion practices	50 ppmvd @ 3% O_2 (15-minute avg)
VOC, Turbines	Good combustion practices	2.0 ppmvd @ 15% O_2 (1-hr avg)
VOC, Auxiliary Boiler	Good combustion practices	NA
SO_2, combustion	Pipeline Natural Gas	NA
PM_{10}/$PM_{2.5}$, combustion	Pipeline Natural Gas	NA
GHGs, GE turbine	Efficient combined-cycle gas turbine	NA
GHGs, Trent Turbines	Efficient simple-cycle gas turbine	NA

3.1.6.3.3 Offsets

The project is exempt from District offset requirement of 1303(b)(2) because Rule 1304(a)(2) applies to this project. Rule 1304(a)(2) exempts affected sources from the modeling requirement of Rule 1303(b)(1) and the offset requirement of Rule 1303(b)(2).

The modeling requirement of Rule 1303(b)(1) and the offset requirement of Rule 1303(b)(2) do not apply to certain sources, including "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. The new equipment must have a maximum electrical power rating (in megawatts) that does not allow basinwide electricity generating capacity on a per-utility basis to increase. If there is an increase in basin-wide capacity, only the increased capacity must be offset."

The project is comprised of three turbines and an auxiliary boiler. The Trent turbines are advanced gas turbines, using an Inlet Spray Intercooling system to reduce ambient inlet temperature and decrease the energy required for compression[9]; and the GE turbine is a combined cycle turbine. The auxiliary boiler is a necessary adjunct to the GE turbine, providing it with the fast-start capability necessary to allow an efficient combined-cycle unit to start up as rapidly as is necessary for this project. By shortening the turbine startup period, during which the SCR system does not reduce emissions to complying levels, the boiler is "other equipment, to the extent that such equipment will allow compliance with Rule 1135 or other Regulation XX rules."

[9] Because of advanced design features, the Trent turbines have a heat rate of approximately 9,000 BTU/kWh (HHV), which is lower than then 9,400 – 10,000 BTU/kWh range for traditional simple-cycle designs.

The three turbines have a combined capacity of no more than 447 MW. They will replace the existing Unit 4 (335 MW), plus the 112 MW remaining for Unit 3 following the previously approved ESPR Project. The project will not allow basinwide electricity generating capacity on a per-utility basis to increase. The project therefore qualifies for the exemption.

CEC policies require nonattainment pollutants, and their precursors, be offset at a 1:1 ratio, or otherwise mitigated in an equivalent way. This requirement will be met through RECLAIM credits (for NOx), and through District-provided offsets (for other nonattainment pollutants), as discussed below.

3.1.6.3.4 Air Quality Impact Analysis

Under the SCAQMD new source review regulations, an air quality impact analysis must be performed to confirm that the emission increases for a project will not interfere with the attainment or maintenance of an applicable ambient air quality standard or cause additional violations of a standard anywhere the standard is already exceeded. The modeling results presented in Section 3.1.4.16 show that the proposed project will not interfere with the attainment or maintenance of the applicable air quality standards or cause additional violations of any standards.

3.1.6.3.5 New Source Review Requirements for Air Toxics

The SCAQMD's New Source Review (NSR) rule for air toxics (Regulation XIV, Rule 1401, New Source Review of Toxic Air Contaminants) describes the requirements, procedures, and standards for evaluating the potential impact of toxic air contaminants (TAC) from new sources and modifications to existing sources. The rule also requires a demonstration that the source will not exceed the applicable health risk thresholds. ESPFM will comply with the requirements of this rule. An air toxics health risk assessment consistent with SCAQMD requirements under Rule 1401 is provided in Section 3.8 of this PTA, Public Health and Safety.

3.1.6.3.6 New Source Performance Standards

The District's New Source Performance Standards (Regulation X, Standards of Performance for New Stationary Sources) incorporates the federal NSPS from 40 CFR Part 60. The applicability and requirements of and compliance with the New Source Performance Standards are discussed above under the federal regulations section.

3.1.6.3.7 Federal Programs and Permits

The federal Title IV acid rain program requirement and Title V operational permit requirements are in SCAQMD's Rule XXXI (Acid Rain Permit Program) and Regulation XXX (Title V Permits). The applicability and requirements of and compliance with these programs and permits are discussed above under the federal regulations section.

3.1.6.3.8 Public Notification

Because the proposed ESPFM project emissions will exceed the trigger levels in Rule 212(g), public notice is required and the project pwner expects that the Air Pollution Control Officer will provide this notice in a timely manner.

3.1.6.3.9 Permit Fees

The SCAQMD requirements regarding permit fees are specified in Regulation III. This regulation establishes the filing and permit review fees for specific types of new sources, as well as annual renewal fees and penalty fees for existing sources. The project owner has paid the application filing fees, and will pay other applicable fees in accordance with these requirements.

3.1.6.3.10 Prohibitions

The SCAQMD prohibitions for specific types of sources and pollutants are addressed in Regulation IV. The prohibition rules that apply to the proposed ESPFM project are listed below.

RULE 401-Visible Emissions

This rule limits visible emissions to an opacity of less than 20% (No.1 on the Ringelmann Chart, as published by the U.S. Bureau of Mines). With the use of natural gas, DLN and DLE combustors, and SCR systems, it is unlikely that there will be visible emissions following the early stages of the commissioning period. However, in the unlikely event that visible emissions do occur, anything greater than 20% opacity is not expected to last for greater than three minutes. During normal operation, no visible emissions are expected. The small package boiler will burn only natural gas, and is unlikely to cause visible emissions. Therefore, based on the above and on experience with other CTGs, compliance with this rule is expected.

RULE 402-Nuisance

This rule requires that a person not discharge from any source whatsoever such quantities of air contaminants or other material that cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public; or that cause, or have a natural tendency to cause, injury or damage to business or property. The new CTGs will be operated with natural gas, DLN and DLE combustors, and SCR systems to comply with BACT and are not expected to create a public nuisance based on experience with similar CTGs. The small package boiler will burn only natural gas, and is unlikely to create a public nuisance. Therefore, compliance with Rule 402 is expected.

RULE 403-Fugitive Dust

The purpose of this rule is to reduce the amount of particulate matter entrained in the ambient air as a result of man-made fugitive dust sources by requiring actions to prevent, reduce, or mitigate fugitive dust emissions. 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 project owner will be taking steps to prevent and/or reduce or mitigate fugitive dust emissions from the project site. Such measures include covering loose material on haul vehicles, watering, and using chemical stabilizers when necessary. The installation and operation of the CTGs and boiler are expected to comply with this rule.

RULE 407-Liquid and Gaseous Air Contaminants

This rule limits CO emissions to 2,000 ppmvd and SO_2 emissions to 500 ppmvd, averaged over 15 minutes. For CO, the GE and Trent CTGs will be required to meet BACT limits for CO of 2.0 and 4.0 ppmvd at 15% O_2, 1-hr average, respectively, and will be conditioned as such. The boiler will be required to meet a limit of 50 ppm. For SO_2, equipment that complies with Rule 431.1 is exempt from the SO_2 limit in Rule 407. The project owner will be required to comply with Rule 431.1, and thus the SO_2 limit in Rule 407 will not apply. Accordingly, compliance 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% CO_2, averaged over 15 minutes. The equipment is expected to meet this limit based on the calculations shown below.

<u>GE Turbine</u>

Estimated exhaust gas	=	543,892 DSCFM = 32.6 mmscf/hr (90ºF, low load)
Maximum PM_{10} Emissions	=	9.5 lb/hr
Estimated CO_2 in exhaust	=	3%

$$\text{Grain Loading} = \frac{(9.5\ \text{lb/hr})(7000\ \text{gr/lb})}{32.6\text{EE6 scf/hr}} \times \frac{12}{3} = 0.0082\ \text{gr/dscf} << 0.1\ \text{gr/dscf}$$

Trent 60 Turbines

Estimated exhaust gas	=	174,000 DSCFM = 10.4 mmscf/hr (90ºF, low load)
Maximum PM_{10} Emissions	=	5.0 lb/hr
Estimated CO_2 in exhaust	=	3%

$$\text{Grain Loading} = \frac{(5.0\ \text{lb/hr})(7000\ \text{gr/lb})}{10.4\ \text{EE6 scf/hr}} \times \frac{12}{3} = 0.013\ \text{gr/dscf} << 0.1\ \text{gr/dscf}$$

Auxiliary Boiler

Estimated exhaust gas	=	6,100 DSCFM = 0.37 mmscf/hr (full load)
Maximum PM_{10} Emissions	=	0.3 lb/hr
Estimated CO_2 in exhaust	=	12%

$$\text{Grain Loading} = \frac{(0.3\ \text{lb/hr})(7000\ \text{gr/lb})}{0.37\ \text{EE6 scf/hr}} \times \frac{12}{12} = 0.006\ \text{gr/dscf} << 0.1\ \text{gr/dscf}$$

RULE 431.1-Sulfur Content of Gaseous Fuels

The facility will use pipeline-quality natural gas that will comply with the 16 ppmv sulfur limit, calculated as H_2S, specified in this rule. Natural gas supplied by the Gas Company also has a sulfur content of less than 0.75 gr/100 scf on a short-term basis and 0.25 gr/100scf on a long-term basis, which is equivalent to a sulfur concentration ranging from approximately 12 to 4 ppmv. Accordingly, compliance is expected.

RULE 474-Fuel Burning Equipment-Oxides of Nitrogen

Superseded by NOx RECLAIM.[10]

RULE 475-Electric Power Generating Equipment

This rule applies to power-generating equipment rated greater than 10 MW installed after May 7, 1976. Requirements specify that the equipment must comply with a PM_{10} mass emission limit of 11 lbs/hr or a PM_{10} concentration limit of 0.01 grains/dscf. Compliance is demonstrated if either the mass emission limit or the concentration limit is met. The PM_{10} mass emissions from the GE CTG are estimated to be 9.5 lbs/hr. The estimated grain loading is less than 0.01 grain/dscf (see calculations under Rule 409 analysis). The PM_{10} mass emissions from each Trent 60 CTG are estimated to be 5 lbs/hr. The estimated grain loading is less than 0.01 grain/dscf (see calculations under Rule 409 analysis). Therefore, compliance is expected. Compliance will be verified through performance tests.

RULE 476-Steam Generating Equipment

Superseded by NOx RECLAIM.[11]

3.1.7 Mitigation Measures

Mitigation will be provided for project emissions in the form of offsets and the installation of BACT, as required under SCAQMD regulations. The cumulative air quality impacts analysis described in Section 3.1.5 shows that the project will not result in significant cumulative impacts.

As discussed in Section 3.1.6.3, the project's sources will be subject to RECLAIM. Under RECLAIM, NOx offsets are provided on an ongoing basis at a 1:1 ratio.

[10] SCAQMD Rule 2001(j).

[11] SCAQMD Rule 2001(j).

The project is exempt from District offset requirements under Rule 1304(b). This regulation is intended to provide incentives to replace existing electric utility boilers with combined cycle and advanced turbine units. Under this program, the District determines the creditable emission reductions associated with the replaced boilers, and places them in the District's internal emission offset bank; the District then provides offsets required by the project from the bank. The amount of offsets provided from District offset accounts is the same as would have been provided by the project owner that did not qualify for the exemption; all emission increases of VOC, SOx, and PM_{10} will be offset under this program.

Additionally, it is the CEC's policy to require mitigation for the full amounts of all nonattainment pollutants and their precursors at a ratio of at least 1:1. Accordingly, the full project emissions of NOx, VOC, PM_{10}, $PM_{2.5}$, and SO_2 will be mitigated. Mitigation for CO will not be required because of the current attainment designation of the SCAQMD air basin for this pollutant.

Table 3.1-37 summarizes the offset requirements applicable to the project.

As discussed above, the project's GHG impacts are not significant. GHG regulatory offset requirements will be addressed through acquisition of allowances under CARB's Cap-and-Trade program.

TABLE 3.1-37
ESPFM Offset Requirements

Pollutant	Project Emissions (TPY)	District Offset Requirements (TPY)	CEC Mitigation Requirements (TPY)
NOx	93.5	RECLAIM	RECLAIM
CO	2702.1	—	—
VOC	33.0	Fully offset from SCAQMD's Internal Bank	33.0
SO_2	6.5		6.5
PM_{10}	51.1		51.1
GHGs	968,000	—	Cap & Trade Allowances

3.1.8 Permits Required and Permit Schedule

Under Regulation II of its Rules and Regulations, SCAQMD regulates the construction, alteration, replacement, and operation of new stationary emissions sources and modifications to existing sources. As part of the application review process, the District's Air Pollution Control Officer will conduct a Determination of Compliance (DOC) review upon receipt of the PTA for the proposed ESPFM project. This DOC for the project will be provided by SCAQMD as part of the CEC review to confirm that the project will meet all of the District's rules and regulations. A preliminary DOC (PDOC) is expected within approximately 180 days after acceptance of the application is complete. The PDOC will be circulated for public comment, and a final DOC (FDOC) will be issued by the SCAQMD after comment has been considered and addressed. Upon receiving CEC's final license, the SCAQMD will be responsible for issuing a Permit to Construct (PTC) and Permit to Operate (PTO) for ESPFM. This permitting process allows the SCAQMD to adequately review new and modified air pollution sources to ensure compliance with all applicable prohibitory rules and to ensure that appropriate emission controls will be used. A PTC allows for the construction of the air pollution source and remains in effect until the PTO application is granted, denied, or canceled. Once the project has completed construction and commences operations, SCAQMD will require verification that ESPFM conforms to the PTC application and, following such verification, will issue a PTO. The PTO specifies conditions that the air pollution source must meet to comply with all air quality standards and regulations.

The SCAQMD has also received delegation from EPA to administer the federal Title IV and Title V programs for sources within its jurisdiction. The project will be subject to acid rain program requirements. The District's permit program is an integrated program; the ATC is also the amended Title V permit.

EPA has delegated authority to the SCAQMD to issue PSD permits. The PTC, when issued, will serve as the PSD permit as well.

3.1.9 References

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3.2 Biological Resources

This section describes and evaluates potential effects the proposed changes may have on biological resources. Compliance with applicable LORS is also addressed.

3.2.1 Amendment Overview

As discussed in detail in Section 2.0, Project Description, this PTA proposes modifications to the ESEC that necessitate evaluation of environmental impacts and potential amendments to existing COCs. The proposed PTA is for decommissioning, demolishing, and replacing the existing Units 3 and 4 steam boiler plants with approximately 449 MW gross / 435 MW net of new natural-gas-fired electrical generating capacity, consisting of one combined-cycle train and two simple-cycle gas turbines. The air-cooled, combined-cycle train (CC Fast) will consist of a GTG (Unit 9), a an HRSG, and one STG (Unit 10), rated at 325 MW net. The simple cycle turbines (Units 11 and 12) will consist of two air-cooled Trent 60 ISE advanced aeroderivative gas turbines, each rated at 55 MW net / 58 MW gross. The GE turbine will be supported by a small (36 MMBtu/hr) auxiliary boiler that will be incorporated into the operation of the CC Fast. Removal of existing Units 3 and 4 will eliminate the remaining once-through ocean water cooling system at the ESGS site. The ESPFM will improve electricity generation by adding fast-start and dispatch flexibility capability to support southern California grid load balancing. Total site capacity (including the new equipment previously permitted) will not exceed 1,020 MW net—the rated capacity of previously retired Units 1 and 2, plus the capacity of the soon-to-be-retired Unit 3 and operating Unit 4, which will also be retired as part of the ESPFM.

3.2.2 Affected Environment

3.2.2.1 ESEC Amendments

The proposed ESPFM will result in modifications to the ESEC license (00-AFC-14C). Decommissioning, demolishing, and removing existing Units 3 and 4 and replacing them with new Units 9, 10, 11 and 12 will not result in new impacts to biological resources beyond those identified in the CEC's amended license for 00-AFC-14C and as described in Section 2.0. It is anticipated that demolition of Units 3 and 4 and construction of Units 9–12 will require grading and excavation activities similar to the demolition of Units 1 and 2 and construction activities associated with Units 5 through 8 and their supporting equipment and structures. For the most part, subsurface activities are expected to occur in areas of the site that have been previously disturbed as part of historical power plant operations at the site, including the most current subsurface activities required for the demolition of Units 1 and 2 and construction of Units 5 through 8.

In addition, CH2M HILL staff (Jennifer Scholl, Senior Technical Consultant) participated in two site visits on January 24, 2013, and February 19, 2013. During these visits, CH2M HILL staff, accompanied by NRG representatives, walked areas of the site not currently impacted by construction activities and it was noted that only minimal vegetation presently exists within the facility since most of the facility is either paved, graveled, or under construction. While there is some vegetation growing on the slope along the northern plant boundary and along the eastern fence line, this vegetation consists of non-native species (ice plant, evergreens, and ornamental shrubs, etc.), which are not considered species or habitat requiring protection. As part of the installation of Units 5 through 8, perimeter landscaping will be installed in accordance with VISUAL and LAND COCs. The resource protection measures included in existing COCs BIO-6 through BIO-12 and BIO-14 are adequate to address potential impacts to biological resources from implementation of the ESPFM. The following is a brief description of the existing biological resources COCs:

- **BIO-6** Designated Biologist
- **BIO-7** Designated Biologist Duties
- **BIO-8** Designated Biologist
- **BIO-9** Biological Resources Mitigation Implementation and Monitoring Plan
- **BIO-10** Worker Environmental Awareness Program
- **BIO-11** U.S. Army Corps of Engineers Permit

- **BIO-12** USFWS Biological Opinion
- **BIO-14** Facility Closure

ESEC LLC will continue to comply with the requirements set forth in these COCs.

To determine the impacts of the proposed ESPFM modifications on aquatic and terrestrial resources at the ESGS site, past biological resource surveys conducted for the 2007 ESPR Dry Cooling Amendment (Shaw 2007, AECOM 2010) were reviewed together with updated species lists generated from queries of the California Natural Diversity Database (CNDDB), California Native Plant Society (CNPS), and U.S. Fish and Wildlife Service (USFWS). Table 3.2-1 presents an updated comparison of special-status species that potentially occur at the site compared to those with potential to occur at the site in 2007 (CNDDB 2011, USFWS 2013, CNPS 2013). Sixteen additional species were identified as potentially occurring in the project area during the information review. Figure 3.2-1 shows the results of the queries related to the ESPFM. In addition, CH2M HILL staff conducted a site reconnaissance on January 24, 2013, and February 19, 2013, to assess current conditions including wildlife habitat, special-status species, and wetlands. No new habitats, wetlands, or special-status species were observed during the reconnaissance survey.

TABLE 3.2-1
Summary of Changes/Additions of Potentially Occurring Special Status Species in the Project Area (USGS Venice quad)

Scientific Name	2007 Fed/State Status	2013 Fed/State Status	Comments	Suitable Habitat (Y/N)
Wildlife				
American badger *Taxidea taxus*	N/A	—/CSC	New addition from 2011 CNDDB search.	N
pocketed free-tailed bat *Nyctinomops femorosaccus*	—/S2S3	—/CSC		N
Big free-tailed bat *Nyctinomops macrotis*	N/A	—/CSC	New addition from 2011 CNDDB search.	N
Pallid bat *Antrozous pallidus*	N/A	—/CSC	New addition from 2011 CNDDB search.	N
Western mastiff bat *Eumops perotis californicus*	N/A	—/CSC	New addition from 2011 CNDDB search. Unlikely to roost in project area.	Unlikely
Pacific pocket mouse *Perognathus longimembris pacificus*	FE/CSC	FE/CSC	Not included in AFC. Extirpated.	N
South Coast marsh vole *Microtus californicus stephensi*	N/A	—/CSC	New addition from 2011 CNDDB search.	N
Southern California saltmarsh shrew *Sorex ornatus salicornicus*	N/A	—/CSC	New addition from 2011 CNDDB search.	N
western snowy plover *Charadrius alexandrius nivosus*	FT/—	FT/CSC	New state status. Still extirpated from the project area.	N
California least tern *Sterna antillarum browni*	FE/SE	FE/SE, FP	New status as state fully protected.	N
California brown pelican *Pelecanus occidentalis californicus*	FE/SE	—/—,FP	De-listed by state and federal. Now fully protected in CA. Not included in AFC, presumed extant. Roost at Marina del Rey breakwater is 2nd largest in southern CA.	Y
Light-footed clapper rail *Rallus longirostris levipes*	N/A	FE/SE, FP	New addition from 2013 USFWS list.	N

TABLE 3.2-1
Summary of Changes/Additions of Potentially Occurring Special Status Species in the Project Area (USGS Venice quad)

Scientific Name	2007 Fed/State Status	2013 Fed/State Status	Comments	Suitable Habitat (Y/N)
Burrowing owl *Athene cunicularia*	N/A	—/CSC	New addition from 2011 CNDDB search.	N
Least Bell's vireo *Vireo bellii pusillus*	N/A	FE/SE	New addition from 2013 USFWS list.	N
Southwestern willow flycatcher *Empidonax traillii extimus*	N/A	FE/SE	New addition from 2013 USFWS list.	N
tricolored blackbird *Agelaius tricolor*	—/CSC	—/CSC		N
coastal California gnatcatcher *Polioptila californica californica*	FT/CSC	FE/CSC	Now listed as federally endangered.	N
Belding's savannah sparrow *Passerculus sandwichensis beldingi*	—/SE	—/SE		N
Coast (San Diego) horned lizard *Phrynosoma coronatum [=blainvillii]*	—/CSC, S3S4	—/CSC		N
Silvery legless lizard *Anniella pulchra pulchra*	N/A	—/CSC	New addition from 2011 CNDDB search.	N
Western pond turtle *Emys marmorata*	N/A	—/CSC	New addition from 2011 CNDDB search.	N
California red-legged frog *Rana draytonii*	N/A	FE/CE	New addition from 2013 USFWS list.	N
Mohave tui chub *Gila bicolor mohavensis*	FE/SE	FE/SE,FP	Now fully protected in CA. Extirpated.	N
sandy beach tiger beetle *Cicindela hirticollis gravida*	—/S1	—/S1	Extirpated.	N
monarch butterfly *Danaus plexippus*	—/S3	—/S3	Still presumed extant.	Y
Palos Verdes blue butterfly *Glaucopsyche lygdamus palosverdesensis*	FE/S1	FE/S1	Possibly extirpated.	N
Riverside fairy shrimp *Streptocephalus wootoni*	N/A	FE/—	New addition from 2013 USFWS list.	N
Vernal pool fairy shrimp *Branchinecta lynchi*	N/A	FT/—	New addition from 2013 USFWS list.	N
Plants				
Coastal dunes milk-vetch *Astraglus tener* var. *titi*	--/CNPS 1B.1	FE/CNPS 1B.1	Now listed as federally endangered.	N
Parish's brittlescale *Atriplex parishii*	--/CNPS 1B.1	--/CNPS 1B.1		N
South Coast saltscale *Atriplex pacifica*	--/CNPS 1B.2	--/CNPS 1B.2		N

TABLE 3.2-1
Summary of Changes/Additions of Potentially Occurring Special Status Species in the Project Area (USGS Venice quad)

Scientific Name	2007 Fed/State Status	2013 Fed/State Status	Comments	Suitable Habitat (Y/N)
Davidson's saltscale *Atriplex serenana* var. *davidsonii*	--/CNPS 1B.2	--/CNPS 1B.2		N
southern tarplant *Centromadia parryi* ssp. *australis*	--/CNPS 1B.1	--/CNPS 1B.1		N
Coulter's goldfields *Lasthenia glabrata* ssp. *coulteri*	--/CNPS 1B.1	--/CNPS 1B.1		N
salt marsh bird's-beak *Cordylanthus maritimus* ssp. *maritimus*	--/S2.1	FE/CE,1B.2	New state and federal status.	N
Mud nama *Nama stenocarpum*	N/A	--/CNPS 2.2	New addition from 2011 CNPS inventory.	N
prostrate navarretia *Navarretia prostrata*	--/S2.1	--/CNPS 1B.1	New status.	N
coast woolly-heads *Nemacaulis denudata* var. *denudata*	--/CNPS 1B.2	--/CNPS 1B.2		N
California Orcutt grass *Orcuttia californica*	—/CNPS 1B.1	FE/CE, CNPS 1B.1	Now listed as state candidate and federal endangered.	N
Lyon's pentachaeta *Pentachaeta lyonii*	--/S1.1	FE/CE, CNPS 1B.1	Now listed as state candidate and federal endangered.	N
Brand's phacellia *Phacelia stellaris*	--/S1.1, CNPS 1B.1	FC/CNPS 1B.1	Now listed as federal candidate.	N
estuary seablite *Suaeda esteroa*	--/CNPS 1B.2	--/CNPS 1B.2		N
San Bernardino aster *Symphyotrichum defoliatum*	--/CNPS 1B.2	--/CNPS 1B.2		N

Notes: CSC – California State Species of Concern, FC – Federal Candidate, FE – Federal Endangered, FT- Federal Threatened, SE – California State Candidate as Endangered, SE – California State Endangered, ST – California State Threatened, CNPS – California Native Plant Society ranking.

3.2.3 Environmental Analysis

As discussed in Section 2.0, Project Description, the demolition and removal of Units 3 and 4 and the installation and operation of new gas turbine Units 9, 11, and 12 and steam turbine Unit 10 will result in similar grading, excavation, foundation, and underground infrastructure activities as were required for the previous demolition of Units 1 and 2 and the previous construction of Units 5 through 8 and their supporting equipment and structures. For the most part, subsurface activities required for ESPFM will to occur in areas of the site that have been previously disturbed as part of historical power plant operations, including the areas recently excavated for demolition of Units 1 and 2 and construction of Units 5 through 8, and therefore, impacts beyond those described in 00-AFC-14 (and the previous PTAs) are not anticipated. During the site visits conducted on January 24, 2013 and February 19, 2013, CH2M HILL staff, noted that only minimal vegetation presently exists within the facility since most of the facility is either paved, graveled, or under construction. While there is some vegetation growing on the slope along the northern plant boundary and along the eastern fence line, this vegetation consists of non-native species (ice plant, evergreens, and ornamental shrubs. etc) and is not considered species or habitat requiring protection. Therefore, the ESPFM will not result in the permanent alteration of any existing sensitive habitat and impacts to special-status species are not expected to occur, including the 16 additional species, listed in Table 3.2-1, and identified during the updated information review and as observed during recent site visits in January and February 2013. Therefore, the resource protection measures included in existing COCs BIO-6 through BIO-12 and BIO-14 are adequate to address potential impacts to biological resources and the ESPFM demolition and construction activities will be conducted in accordance with these COCs and applicable LORS.

3.2.3.1 Offsite Construction Laydown and Construction Worker Parking Areas

The preferred offsite laydown area, located at 777 W. 190th Street in the City of Gardena, was incorporated into ESEC in the 2010 PTA decision and will continue to be used for ESPFM. Construction laydown and parking areas will also be established within the ESGS site boundary, as well as at offsite areas identified in the CEC Final Decision and shown on Figure 2-10. The 190th Street area is less than ten miles southeast of the ESGS and is easily accessible to the I-405 and I-110 North freeways from Vermont Avenue and 190th Street as well as to ESEC-approved traffic/truck routes. This site, zoned M2, commercial, has approximately ten usable acres and includes a 5,500 square-foot industrial building. The approximately 12.1-acre site paved with asphalt has nightlighting and includes a perimeter security fence. No site preparation other than minor clean-up is required prior to use. Therefore, subsurface ground disturbance is not required and no biological resource impacts will result from using offsite construction laydown and parking areas.The existing COCs ensure that construction-related activities at the approved laydown areas will comply with appropriate biological resource protection plans.

3.2.4 Cumulative Impacts

The proposed ESPFM covered under this PTA will result in similar subsurface activities as was required for the previous demolition of Units 1 and 2 and construction of Units 5 through 8 and their supporting equipment and structures. ESPFM subsurface demolition and construction activities are expected to occur in areas of the ESGS site that have been previously disturbed as part of historical power plant operations at the site and impacts beyond those described in 00-AFC-14 (and the previous PTAs) are not anticipated. The proposed project changes will not result in any significant cumulative impacts to biological resources beyond those addressed in the CEC Final Decision and subsequent amendments. The cumulative impacts to biological resources, which were identified by CEC staff as part of the previously permitted project, focused on potential cumulative impacts associated with once-through cooling. The proposed elimination of once-through cooling associated with the ESPFM presents a net benefit to marine biological resources and eliminates the previously permitted project's main contribution to cumulative impacts on biological resources. In addition, the removal of beach delivery option eliminates potential impacts to nearshore habitats and species.

Therefore, the resource protection measures included in existing COCs BIO-6 through BIO-12 and BIO-14 are adequate to address potential impacts to biological resources and therefore will not result in any significant cumulative impacts beyond those addressed in the CEC Final Decision for 00-AFC-14.

3.2.5 Laws, Ordinances, Regulations and Standards

The CEC Final Decision found the project to be in compliance with applicable biology LORS. As described in this PTA, the proposed ESPFM is consistent with applicable biology-related LORS and the Amendment will not alter the assumptions or conclusions in the CEC Final Decision and no additional or revised LORS compliance requirements have been identified.

3.2.6 Conditions of Certification

Existing COCs BIO-6 through BIO-12 and BIO-14 are adequate to address ESPFM without being amended, with the exception of the minor changes below that focus on the single fuel tank being removed as part of this PTA. These COCs are provided below.

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

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

The Designated Biologist must meet the following minimum qualifications:

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

If a Designated Biologist needs to be replaced, then the specified information of the proposed replacement must be submitted to the CPM at least ten working days prior to the termination or release of the preceding Designated Biologist.

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

1. Advise the project owner's Construction/Operation Manager, supervising construction and operations engineer on the implementation of the biological resources Conditions of Certification;
2. Be available to supervise or conduct mitigation, monitoring, and other biological resources compliance efforts, particularly in areas requiring avoidance or containing sensitive biological resources, such as special status species or their habitat;
3. Clearly mark sensitive biological resource areas and inspect these areas at appropriate intervals for compliance with regulatory terms and conditions;
4. Notify the project owner and the CPM of any non-compliance with any biological resources Condition of Certification; and
5. Respond directly to inquiries of the CPM regarding biological resource issues.

Verification: The Designated Biologist shall maintain written records of the tasks described above, and summaries of these records shall be submitted in the Monthly Compliance Reports.

As necessary during project operation, the Designated Biologist shall submit record summaries in the Annual Compliance Report.

BIO-8 Designated Biologist Authority: The project owner's Construction/Operation Manager shall act on the advice of the Designated Biologist to ensure conformance with the biological resources Conditions of Certification.

If required by the Designated Biologist, 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 adverse impact to biological resources if the activities continued:
2. Inform the project owner and the Construction/Operation Manager when to resume activities; and
3. Notify the CPM if there is a halt of any activities due to conflicts with biological resources, and advise the CPM of any corrective actions that have been taken, or will be instituted, as a result of the halt.

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

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

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

The BRMIMP shall include:

1. All new Biological Resource conditions included in the Energy Commission's Final Decision as amended;
2. All biological resources mitigation, monitoring, and compliance measures proposed and agreed to by the project owner;
3. A list and a map of locations of all sensitive biological resources to be impacted, avoided, or mitigated by project construction and operation;
4. A list of all terms and conditions set forth by USACE permits and necessary state LARWQCB certifications, should these become necessary throughout the life of the project;
5. Detailed descriptions of all measures that will be implemented to avoid and/or minimize impacts to sensitive species and reduce habitat disturbance;
6. All locations, on a map of suitable scale, of areas requiring temporary protection and avoidance during construction;
7. Duration for each type of monitoring and a description of monitoring methodologies and frequency;
8. Performance standards to be used to help decide if/when proposed mitigation is or is not successful;
9. All performance standards and remedial measures to be implemented if performance standards are not met;
10. A discussion of biological resource-related facility closure measures;
11. A process for proposing plan modifications to the CPM and appropriate agencies for review and approval;
12. A copy of any State or USFWS Biological Opinion or NMFS consultation, and incorporation of all terms and conditions into the final BRMIMP, should a biological opinion become necessary any time throughout the life of the project; <u>and</u>

~~13. Protocols for dealing with wildlife that gain access the barges, beach delivery ramp, and other project features whereby their well being could be at risk; and~~

13. Vegetation restoration that provides for planting seacliff buckwheat (*Eriogonum parviflorum*), eradication of ice plant (*Carpobrotus chilensis*), and is coordinated with Visual Resources landscaping requirements.

Verification: At least 30 days prior to start of any site mobilization ~~activities related to the beach front or the beach delivery system~~, the project owner shall provide the CPM with the final version of the BRMIMP for this project, and the CPM will determine the plans acceptability. The project owner shall notify the CPM five (5) working days before implementing any CPM approved modifications to the BRMIMP.

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

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

The Worker Environmental Awareness Program must:

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

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

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

BIO-11 U.S. Army Corps of Engineers Permit: The project owner shall acquire any USACE permit required and incorporate its terms and conditions into the BRMIMP.

Verification: No less than 30 days prior to the start of any site mobilization activities related to the beach front or the beach delivery system, the project owner shall submit to the CPM a copy of the USACE permit required to construct any project related features. Permit terms and conditions will be incorporated into the BRMIMP.

BIO-12 USFWS Biological Opinion: If formal or informal consultation between the USFWS and USACE occurs, the project owner shall incorporate into the BRMIMP any resulting biological resources recommendations.

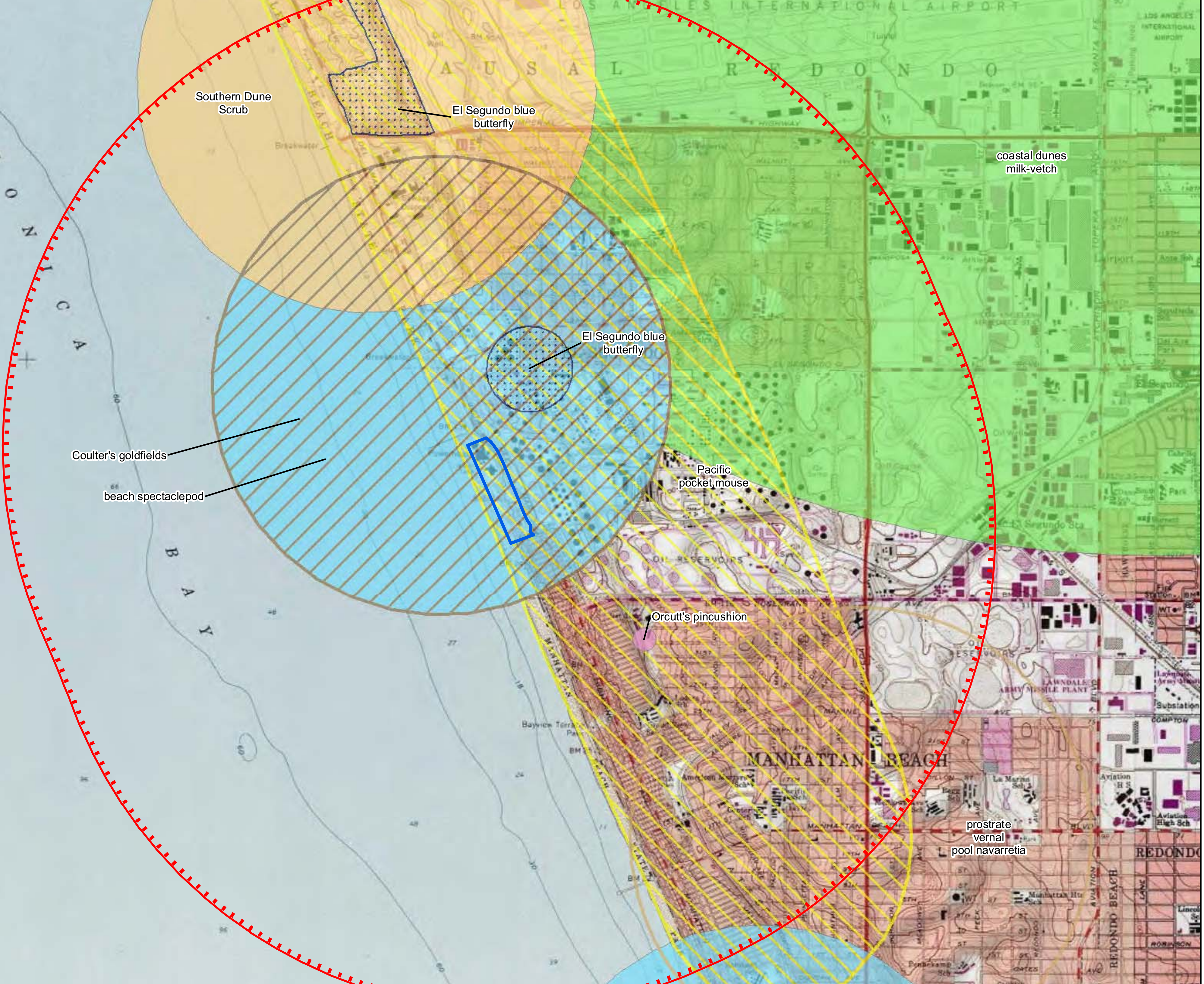
Verification: No less than 30 days prior to the start of any site mobilization ~~activities related to the beach front or the beach delivery system~~, the project owner must provide the CPM with a copy of the USFWS recommendations. All terms and conditions resulting from the consultation will be incorporated into the BRMIMP.

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

Verification: No less than 30 days prior to the start of any site mobilization activities ~~related to the beach front or the beach delivery system~~, the project owner will provide the CPM with a copy of the final Regional Water Quality Control Board certification. The terms and conditions of the certification will be incorporated into the project’s BRMIMP.

BIO-14 Facility Closure: The project owner will incorporate into the planned permanent or unexpected permanent closure plan measures that address the local biological resources. The biological resource facility closure measures will also be incorporated into the project BRMIMP.

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



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3.3 Cultural Resources

This section describes and evaluates potential effects the proposed changes may have on cultural resources. Compliance with applicable LORS is also addressed.

3.3.1 Amendment Overview

As discussed in detail in Section 2.0, Project Description, this PTA proposes modifications to the ESEC that necessitate evaluation of environmental impacts and potential amendments to existing COCs. The proposed PTA is for decommissioning, demolishing, and replacing the existing Units 3 and 4 steam boiler plants with approximately 449 MW gross / 435 MW net of new natural-gas-fired electrical generating capacity, consisting of one combined-cycle train and two simple-cycle gas turbines. The air-cooled, combined-cycle train (CC Fast) will consist of a GTG (Unit 9), a an HRSG, and one STG (Unit 10), rated at 325 MW net. The simple cycle turbines (Units 11 and 12) will consist of two air-cooled Trent 60 ISE advanced aeroderivative gas turbines, each rated at 55 MW net / 58 MW gross. The GE turbine will be supported by a small (36 MMBtu/hr) auxiliary boiler that will be incorporated into the operation of the CC Fast. Removal of existing Units 3 and 4 will eliminate the remaining once-through ocean water cooling system at the ESGS site. The ESPFM will improve electricity generation by adding fast-start and dispatch flexibility capability to support southern California grid load balancing. Total site capacity (including the new equipment previously permitted) will not exceed 1,020 MW net—the rated capacity of previously retired Units 1 and 2, plus the capacity of the soon-to-be-retired Unit 3 and operating Unit 4, which will also be retired as part of the ESPFM.

3.3.2 Affected Environment

3.3.2.1 ESEC Amendments

The proposed ESPFM will result in modifications to the ESEC license (00-AFC-14C). Decommissioning, demolishing, and removing existing Units 3 and 4 and replacing them with new Units 9, 10, 11 and 12 will not result in new impacts to cultural resources beyond those identified in the CEC's amended license for 00-AFC-14C and as described in Section 2.0. It is anticipated that demolition of Units 3 and 4 and construction of Units 9–12 will require grading and excavation activities similar to the demolition of Units 1 and 2 and construction activities associated with Units 5 through 8 and their supporting equipment and structures. Demolition of Units 1 and 2, construction of Units 5 through 8, and construction of balance of plant facilities (entrance road modification, transmission tower installation, 45th Street berm construction and neighboring tank farm area grading, and demineralization water treatment and storage) has resulted in the investigation of subsurface soil for cultural resources in substantially the entire facility, with the exception of the Units 3 and 4 powerblock area and SCE switchyard. It is anticipated that the cultural resource observations beneath Units 3 and 4, if discovered, will not be significant based on the extensive inspection by the Cultural Resource Specialist and Monitors during the ESEC construction. The resource protection measures included in existing COCs CUL-1 through CUL-7 are adequate to address potential impacts to cultural resources during construction. The following is a brief description of the cultural resources existing COCs:

- **CUL-1** Designated Cultural Resources Specialist
- **CUL-2** Project Maps Showing Ground Disturbance
- **CUL-3** Cultural Resources Monitoring and Mitigation Plan
- **CUL-4** Cultural Resources Report
- **CUL-5** Worker Environmental Awareness Program
- **CUL-6** Cultural Resources Monitoring
- **CUL-7** Designated Cultural Resource Specialist Authority
- **CUL-8** Water Pipeline Realignment

ESEC LLC will continue to comply with the requirements set forth in these COCs.

3.3.3 Environmental Analysis

As discussed in Section 2.0, Project Description, the demolition and removal of Units 3 and 4 and the installation and operation of new Units 9 through 12 will result in similar grading, excavation, foundation, and underground infrastructure activities as were required for the demolition of Units 1 and 2 and the construction of Units 5 through 8. Furthermore, because subsurface activities required for ESPFM are expected to occur in areas of the ESGS site that have been previously disturbed as part of historical power plant operations at the site, including the most current subsurface activities required for the demolition of Units 1 and 2 and construction of Units 5 through 8, no impacts beyond those described in 00-AFC-14 are anticipated. Therefore, the resource protection measures included in existing COCs CUL-1 through CUL-7 are adequate to address potential impacts to cultural resources and the demolition and construction activities will be conducted in accordance with these COCs and all applicable LORS.

3.3.3.1 Offsite Construction Laydown and Construction Worker Parking Areas

The preferred offsite laydown area, located at 777 W. 190th Street in the City of Gardena, was incorporated into ESEC in the 2010 PTA decision and will continue to be used for ESPFM. Construction laydown and parking areas will also be established within the ESGS site boundary, as well as at offsite areas identified in the CEC Final Decision and shown on Figure 2-10. The 190th Street area is less than ten miles southeast of the ESGS and is easily accessible to the I-405 and I-110 North freeways from Vermont Avenue and 190th Street as well as to ESEC-approved traffic/truck routes. This site, zoned M2, commercial, has approximately ten usable acres and includes a 5,500 square-foot industrial building. The approximately 12.1-acre site paved with asphalt has nightlighting and includes a perimeter security fence. No site preparation other than minor clean-up is required prior to use. The existing COCs ensure that construction-related activities at the approved laydown areas will comply with appropriate cultural resource protection plans and no cultural resource impacts will result from using offsite construction laydown and parking areas.

3.3.4 Cumulative Impacts

The proposed ESPFM covered under this PTA will result in similar subsurface activities required for the previous demolition of Units 1 and 2 and previous construction of Units 5 through 8 and their supporting equipment and structures. ESPFM subsurface demolition and construction activities are expected to occur in areas of the ESGS site that have been previously disturbed as part of historical power plant operations at the site and impacts beyond those described in 00-AFC-14 are not anticipated. Therefore, the resource protection measures included in existing COCs CUL-1 through CUL-7 are adequate to address potential impacts to cultural resources and therefore will not result in any significant cumulative impacts beyond those addressed in the CEC Final Decision for 00-AFC-14.

3.3.5 Laws, Ordinances, Regulations and Standards

The CEC Final Decision found the project to be in compliance with applicable cultural resources LORS. As described in this Amendment, the proposed ESPFM is consistent with applicable cultural-related LORS and the Amendment will not alter the assumptions or conclusions in the CEC Final Decision and no additional or revised LORS compliance requirements have been identified.

3.3.6 Conditions of Certification

Existing COCs CUL-1 through CUL-7 are adequate to address ESPFM without being amended, with the exception of the minor changes below that focus on the single fuel tank being removed, construction of the offsite reclaimed water line, and any references to work or delivery on the beach as part of this PTA. These COCs are provided below.

CUL-1 Designated Cultural Resources Specialist: Prior to the start of ground disturbance, the project owner shall submit the resume of the proposed Cultural Resources Specialist (CRS), and one alternate CRS, if an alternate is proposed, to the CPM for review and approval. The CRS will be responsible for implementation of all cultural resources conditions of certification and may obtain qualified cultural resource monitors (CRMs) to monitor as necessary on the project.

The resume for the CRS and alternate, shall include information that demonstrates that the minimum qualifications specified in the U.S. Secretary of Interior Guidelines, as published by the CFR 36, CFR Part 61 are met. In addition, the CRS shall have the following qualifications:

a. The technical specialty of the CRS shall be appropriate to the needs of the project and shall include, a background in anthropology, archaeology, history, architectural history or a related field;

b. At least three years of archaeological or historic, as appropriate, resource mitigation and field experience in California; and

The resume shall include the names and phone numbers of contacts familiar with the work of the CRS on referenced projects and demonstrate that the CRS has the appropriate education and experience to accomplish the cultural resource tasks that must be addressed during ground disturbance, grading, construction and operation. In lieu of the above requirements, the resume shall demonstrate to the satisfaction of the CPM, that the proposed CRS or alternate has the appropriate training and background to effectively implement the conditions of certification.

CRMs shall meet the following qualifications:

a. A BS or BA degree in anthropology, archaeology, historic archaeology or a related field and one year experience monitoring in California; or

b. An AS or AA in anthropology, archaeology, historic archaeology or a related field and four years experience monitoring in California; or

c. Enrollment in upper division classes pursuing a degree in the fields of anthropology, archaeology, historic archaeology or a related field and two years of monitoring experience in California.

The project owner shall ensure that the CRS completes any monitoring, mitigation and curation activities necessary; fulfills all the requirements of these conditions of certification; ensures that the CRS obtains technical specialists, and CRMs, if needed; and that the CRS evaluates any cultural resources that are newly discovered or that may be affected in an unanticipated manner for eligibility to the California Register of Historic Resources (CRHR).

Verification: The project owner shall submit the subject qualifications at least 45 days prior to the start of ground disturbance. At least 10 days prior to a termination or release of the CRS, the project owner shall submit the resume of the proposed replacement CRS. At least 20 days prior to ground disturbance, the CRS shall submit written notification identifying anticipated CRMs for the project stating they meet the minimum qualifications required by this condition. If additional CRMs are needed later, the CRS shall submit written notice one week prior to any new CRMs beginning work.

CUL-2 Project Maps Showing Ground Disturbance: Prior to the start of ground disturbance, the project owner shall provide the CRS and the CPM with maps and drawings showing the footprint of the power plant and all linear facilities. Maps will include the appropriate USGS quadrangles and a map at an appropriate scale (e.g., 1:2000 or 1" = 200') for plotting individual artifacts. If the CRS requests enlargements or strip maps for linear facility routes, the project owner shall provide copies to the CRS and CPM.

If the footprint of the power plant or linear facilities changes, the project owner shall provide maps and drawings reflecting these changes, to the CRS and the CPM for approval. Maps shall identify all areas of the project where ground disturbance is anticipated.

If construction of the project will proceed in phases, maps and drawings, not previously submitted, shall be submitted prior to the start of each phase. Written notification identifying the proposed schedule of each project phase shall be provided to the CRS and CPM.

At a minimum, the CRS shall consult weekly with the project construction manager to confirm area(s) to be worked during the next week, until ground disturbance is completed.

The project owner shall notify the CRS and CPM of any changes to the scheduling of the construction phases.

Verification: The project owner shall submit the subject maps and drawings at least 40 days prior to the start of ground disturbance.

If there are changes to any project related footprint, revised maps and drawings shall be provided at least 15 days prior to start of ground disturbance for those changes.

If project construction is phased, the project owner shall submit the subject maps and drawings 15 days prior to each phase.

A current schedule of anticipated project activity shall be provided to the CRS on a weekly basis during ground disturbance and also provided in each Monthly Compliance Report (MCR).

The project owner shall provide written notice of any changes to scheduling of construction phases within 5 days of identifying the changes. A copy of the current schedule of anticipated project activities shall be submitted in each MCR.

CUL-3 Cultural Resources Monitoring and Mitigation Plan: Prior to the start of ground disturbance, the project owner shall submit the Cultural Resources Monitoring and Mitigation Plan (CRMMP), as prepared by the CRS, to the CPM for approval. The CRMMP shall identify general and specific measures to minimize potential impacts to sensitive cultural resources. Copies of the CRMMP shall reside with the CRS, alternate CRS, each monitor, and the project owner's on-site manager. No ground disturbance shall occur prior to CPM approval of the CRMMP, unless specifically approved by the CPM.

The CRMMP shall include, but not be limited to, the following elements and measures.

1. The following statement shall be added to the Introduction: Any discussion, summary, or paraphrasing of the conditions in this CRMMP is intended as general guidance and as an aid to the user in understanding the conditions and their implementation. If there appears to be a discrepancy between the conditions and the way in which they have been summarized described, or interpreted in the CRMMP, the conditions, as written in the Final Decision, supersede any interpretation of the Conditions in the CRMMP. The cultural resources conditions of certification are attached as an appendix to this CRMMP.
2. A proposed general research design that includes a discussion of research questions and testable hypotheses applicable to the project area. A refined research design will be prepared for any resource where data recovery is required.
3. Specification of the implementation sequence and the estimated time frames needed to accomplish all project-related tasks during ground disturbance, construction, and post-construction analysis phases of the project.
4. Identification of the person(s) expected to perform each of the tasks, their responsibilities; and the reporting relationships between project construction management and the mitigation and monitoring team.
5. A discussion of the inclusion of Native American observers or monitors, the procedures to be used to select them, and their role and responsibilities.
6. A discussion of all avoidance measures such as flagging or fencing, to prohibit or otherwise restrict access to sensitive resource areas that are to be avoided during construction and/or operation, and identification of areas where these measures are to be implemented. The discussion shall address how these measures will be implemented prior to the start of construction and how long they will be needed to protect the resources from project-related effects.

7. A discussion of the requirement that all cultural resources encountered will be recorded on a DPR form 523 and mapped (may include photos). In addition, all archaeological materials collected as a result of the archaeological investigations (survey, testing, data recovery) shall be curated in accordance with The State Historical Resources Commission's "Guidelines for the Curation of Archaeological Collections," into a retrievable storage collection in a public repository or museum. The public repository or museum must meet the standards and requirements for the curation of cultural resources set forth at Title 36 of the Federal Code of Regulations, Part 79.
8. A discussion of any requirements, specifications, or funding needed for curation of the materials to be delivered for curation and how requirements, specifications and funding will be met. The name and phone number of the contact person at the institution. Include a statement in the discussion of requirements that the project owner will pay all curation fees and that any agreements concerning curation will be retained and available for audit for the life of the project.
9. A discussion of the availability and the designated specialist's access to equipment and supplies necessary for site mapping, photographing, and recovering any cultural resource materials encountered during construction.
10. A discussion of the proposed Cultural Resource Report (CRR) which shall be prepared according to Archaeological Resource Management Report (ARMR) Guidelines.

Verification: The project owner shall submit the subject CRMMP at least 30 days prior to the start of ground disturbance. Per ARMR Guidelines the author's name shall appear on the title page of the CRMMP. Ground disturbance activities may not commence until the CRMMP is approved. At least 30 days prior to ground disturbance, a letter shall be provided to the CPM indicating that the project owner will pay curation fees for any materials collected as a result of the archaeological investigations (survey, testing, data recovery).

CUL-4 Cultural Resources Report: The project owner shall submit the Cultural Resources Report (CRR) to the CPM for approval. The CRR shall report on all field activities including dates, times and locations, findings, samplings and analysis. All survey reports, DPR 523 forms and additional research reports not previously submitted to the California Historic Resource Information System (CHRIS) shall be included as an appendix to the CRR.

Verification: The project owner shall submit the subject CRR within 90 days after completion of ground disturbance (including landscaping). Within 10 days after CPM approval, the project owner shall provide documentation to the CPM that copies of the CRR have been provided to the curating institution (if archaeological materials were collected), the State Historic Preservation Officer (SHPO) and the CHRIS.

CUL-5 Worker Environmental Awareness Program: Worker Environmental Awareness Program (WEAP) shall be provided, on a weekly basis, to all new employees starting prior to and for the duration of, ground disturbance.

The training may be presented in the form of a video. The training shall include:

1. A discussion of applicable laws and penalties under the law;
2. Samples or visuals of artifacts that might be found in the project vicinity;
3. Information that the CRS, alternate CRS, and CRMs have the authority to halt construction to the degree necessary, as determined by the CRS, in the event of a discovery or unanticipated impact to a cultural resource;
4. Instruction that employees are to halt work on their own in the vicinity of a potential cultural resources find, and shall contact their supervisor and the CRS or CRM; redirection of work will be determined by the construction supervisor and the CRS;
5. An informational brochure that identifies reporting procedures in the event of a discovery;
6. An acknowledgement form signed by each worker indicating that they have received the training; and
7. A sticker that shall be placed on hard hats indicating that environmental training has been completed.

Verification: The project owner shall provide in the Monthly Compliance Report the WEAP Certification of Completion form of persons who have completed the training in the prior month and a running total of all persons who have completed training to date.

CUL-6 Cultural Resources Monitoring: The CRS, alternate CRS, or monitors shall monitor ground disturbance full time in the vicinity of the project site, linear facilities and ground disturbance at laydown areas or other ancillary areas to ensure there are no impacts to undiscovered resources and to ensure that known resources are not impacted in an unanticipated manner. In the event that the CRS determines that full-time monitoring is not necessary in certain locations, a letter or e-mail providing a detailed justification for the decision to reduce the level of monitoring shall be provided to the CPM for review and approval prior to any reduction in monitoring.

CRMs shall keep a daily log of any monitoring or cultural resource activities and the CRS shall prepare a weekly summary report on the progress or status of cultural resources-related activities. The CRS may informally discuss cultural resource monitoring and mitigation activities with Energy Commission technical staff.

The CRS shall notify the project owner and the CPM, by telephone or e-mail, of any incidents of non-compliance with any cultural resources conditions of certification within 24 hours of becoming aware of the situation. The CRS shall also recommend corrective action to resolve the problem or achieve compliance with the conditions of certification. Cultural resources monitoring activities are the responsibility of the CRS. Any interference with monitoring activities, removal of a monitor from duties assigned by the CRS or direction to a monitor to relocate monitoring activities by anyone other than the CRS shall be considered non-compliance with these conditions of certification.

A Native American monitor shall be obtained to monitor ground disturbance in areas where Native American artifacts may be discovered. Informational lists of concerned Native Americans and Guidelines for monitoring shall be obtained from the Native American Heritage Commission. Preference in selecting a monitor shall be given to Native Americans with traditional ties to the area that will be monitored.

Verification:

1. During the ground disturbance phases of the project, if the CRS wishes to reduce the level of monitoring occurring at the project, a letter identifying the area(s) where the CRS recommends the reduction and justifying the reductions in monitoring shall be submitted to the CPM for review and approval.
2. During the ground disturbance phases of the project, the project owner shall include in the MCR to the CPM copies of the weekly summary reports prepared by the CRS regarding project-related cultural resources monitoring. Copies of daily logs shall be retained onsite and made available for audit by the CPM.
3. Within 24 hours of recognition of a non-compliance issue, the CRS shall notify the CPM by telephone of the problem and of steps being taken to resolve the problem. The telephone call shall be followed by an e-mail or fax detailing the non-compliance issue and the measures necessary to achieve resolution of the issue. Daily logs shall include forms detailing any instances of non-compliance with conditions of certification. In the event of a non-compliance issue, a report written no sooner than two weeks after resolution of the issue that describes the issue, resolution of the issue and the effectiveness or the resolution measures, shall be provided in the next MCR.
4. One week prior to ground disturbance in areas where there is a potential to discover Native American artifacts, the project owner shall send notification to the CPM identifying the person(s) retained to conduct Native American monitoring. If efforts to obtain the services of a qualified Native American monitor are unsuccessful, the project owner shall immediately inform the CPM who will initiate a resolution process.

CUL-7 Designated Cultural Resource Specialist Authority: The CRS, alternate CRS and the CRMs shall have the authority to halt construction if previously unknown cultural resource sites or materials are encountered, or if known resources may be impacted in a previously unanticipated manner. Redirection of ground disturbance shall be accomplished under the direction of the construction supervisor.

If such resources are found or impacts can be anticipated, the halting or redirection of construction shall remain in effect until all of the following have occurred:

1. The CRS has notified the project owner, and the CPM has been notified within 24 hours of the find description and the work stoppage;
2. The CRS, the project owner, and the CPM have conferred and determined what, if any, data recovery or other mitigation is needed;
3. Any necessary data recovery and mitigation has been completed.

Verification: At least 30 days prior to the start of ground disturbance, the project owner shall provide the CPM with a letter confirming that the CRS, alternate CRS and CRMs have the authority to halt construction activities in the vicinity of a cultural resource find, and that the CRS or project owner will notify the CPM immediately (no later than the following morning of the incident or Monday morning in the case of a weekend) of any halt of construction activities, including the circumstance and proposed mitigation measures. The project owner shall provide the CRS with a copy of the letter granting the authority to halt.

~~**CUL-8 Water Pipeline Realignment:** The route for the water lines shall extend down Grand Avenue to Eucalyptus St. to El Segundo Blvd, which is within the water pipeline study area, bordered by El Segundo Blvd., Loma Vista St., Grand Ave. and Eucalyptus St. (Applicant has conducted a cultural resources assessment in the pipeline study area and within the area defined as the proposed project). If the water lines and associated pipelines are to be located anywhere but in an area originally defined as part of the proposed project, a cultural resource assessment shall be conducted prior to any ground disturbance. The cultural resource assessment shall consist of a records search and a pedestrian survey. This approach gives equal emphasis to prehistoric and historic resources and an evaluation of significance. A Native American monitor from a group with historic ties to the affected area shall be retained as part of the cultural resources team during any surveys or subsurface investigation.~~

~~**Verification**: Forty days prior to the start of any ground disturbance or project site preparation at the newly identified location of the waterlines and associated pipelines, the project owner shall submit the following for approval by the CPM: (1) the results of the records search and the results of the survey; (2) an evaluation, including site records, of all cultural resources within or adjacent to the project Area of Potential Effects; and (3) the information shall also include the name and tribal affiliation of the Native American monitor.~~

3.4 Geology and Paleontology

This section describes and evaluates potential effects the proposed changes may have on geology and paleontology resources. Compliance with applicable LORS is also addressed.

3.4.1 Amendment Overview

As discussed in detail in Section 2.0, Project Description, this PTA proposes modifications to the ESEC that necessitate evaluation of environmental impacts and potential amendments to existing COCs. The proposed PTA is for decommissioning, demolishing, and replacing the existing Units 3 and 4 steam boiler plants with approximately 449 MW gross / 435 MW net of new natural-gas-fired electrical generating capacity, consisting of one combined-cycle train and two simple-cycle gas turbines. The air-cooled, combined-cycle train (CC Fast) will consist of a GTG (Unit 9), a an HRSG, and one STG (Unit 10), rated at 325 MW net. The simple cycle turbines (Units 11 and 12) will consist of two air-cooled Trent 60 ISE advanced aeroderivative gas turbines, each rated at 55 MW net / 58 MW gross. The GE turbine will be supported by a small (36 MMBtu/hr) auxiliary boiler that will be incorporated into the operation of the CC Fast. Removal of existing Units 3 and 4 will eliminate the remaining once-through ocean water cooling system at the ESGS site. The ESPFM will improve electricity generation by adding fast-start and dispatch flexibility capability to support southern California grid load balancing. Total site capacity (including the new equipment previously permitted) will not exceed 1,020 MW net—the rated capacity of previously retired Units 1 and 2, plus the capacity of the soon-to-be-retired Unit 3 and operating Unit 4, which will also be retired as part of the ESPFM.

3.4.2 Affected Environment

3.4.2.1 ESEC Amendments

The proposed ESPFM will result in modifications to the ESEC license (00-AFC-14C). Decommissioning, demolishing, and removing existing Units 3 and 4 and replacing them with new Units 9, 10, 11, and 12 will not result in new impacts to geology and paleontology resources beyond those identified in the CEC's amended license for 00-AFC-14C and as described in Section 2.0. It is anticipated that demolition of Units 3 and 4 and construction of Units 9–12 will require grading and excavation activities similar to the demolition of Units 1 and 2 and construction activities associated with Units 5 through 8 and their supporting equipment and structures. Demolition of Units 1 and 2, construction of Units 5 through 8, and construction of balance of plant facilities (entrance road modification, transmission tower installation, 45th Street berm construction and neighboring tank farm area grading, and demineralization water treatment and storage) has resulted in the investigation of subsurface soil for paleontological resources in substantially the entire facility, with the exception of the Units 3 and 4 powerblock area and SCE switchyard. It is anticipated that the paleontological resource observations beneath Units 3 and 4, if discovered, will not be significant based on the extensive inspection by the paleonotological resource specialist and monitors during the ESEC construction. The resource protection measures included in existing COCs GEO-1 through GEO-6 and PAL-1 through PAL-7 are adequate to address potential impacts to geology and paleontology resources. The following is a brief description of the geology and paleontology existing COCs:

GEO-1: Engineering Geologist/Geotechnical Engineer
GEO-2: Liquefaction Analysis
GEO-3: Slope Stability Analysis
GEO-4: Coastal or Geotechnical
GEO-5: Building Code Compliance
GEO-6: Seawall Design
PAL-1: Paleontological Resource Specialist (PRS)
PAL-2: Paleontology Resource Maps
PAL-3: Paleontological Resources Monitoring and Mitigation Plan (PRMMP)
PAL-4: Worker Environmental Awareness Program (WEAP)
PAL-5: Resource Monitoring

PAL-6: Curation Agreement
PAL-7: Paleontological Resources Report (PRR)

ESEC LLC will continue to comply with the requirements set forth in these COCs.

3.4.3 Environmental Analysis

As discussed in Section 2.0, Project Description, the demolition and removal of Units 3 and 4 and the installation and operation of new Units 9, 10, 11, and 12 will result in similar grading, excavation, foundation, and underground infrastructure activities as was required for the demolition of Units 1 and 2 and the construction of Units 5 through 8. Further, because subsurface activities required for ESPFM are expected to occur in areas of the site that have been previously disturbed as part of historical power plant operations at the site, including the most current subsurface activities required for the demolition of Units 1 and 2 and construction of Units 5 through 8, no impacts beyond those described in 00-AFC-14 are anticipated. Therefore, the resource protection measures included in existing COCs GEO-1 through GEO-6 and PAL-1 through PAL-7 are adequate to address potential impacts to geology and paleontology resources and the ESPFM demolition and construction activities will be conducted in accordance with these CECs all applicable LORS.

3.4.3.1 Offsite Construction Laydown and Construction Worker Parking Areas

The preferred offsite laydown area, located at 777 W. 190th Street in the City of Gardena, was incorporated into ESEC in the 2010 PTA decision and will continue to be used for ESPFM. Construction laydown and parking areas will also be established within the ESGS site boundary, as well as at offsite areas identified in the CEC Final Decision and shown on Figure 2-10. The 190th Street area is less than ten miles southeast of the ESGS and is easily accessible to the I-405 and I-110 North freeways from Vermont Avenue and 190th Street as well as to ESEC-approved traffic/truck routes. This site, zoned M2, commercial, has approximately ten usable acres and includes a 5,500 square-foot industrial building. The approximately 12.1-acre site paved with asphalt has nightlighting and includes a perimeter security fence. No site preparation other than minor clean-up is required prior to use. The existing COCs ensure that construction-related activities at the approved laydown areas will comply with appropriate geology and palentonolgy resource protection plans and no geology or paleontology resource impacts will result from using offsite construction laydown and parking areas.

3.4.4 Cumulative Impacts

The proposed ESPFM covered under this PTA will result in similar subsurface activities required for the demolition of Units 1 and 2 and construction of Units 5 through 8. ESPFM subsurface demolition and construction activities are expected to occur in areas of the ESGS site that have been previously disturbed as part of historical power plant operations at the site and impacts beyond those described in 00-AFC-14 are not anticipated. Therefore, the resource protection measures included in existing COCs GEO-1 through GEO-6 and PAL-1 through PAL-7 are adequate to address potential impacts to geology and paleontology resources and therefore will not result in any significant cumulative impacts beyond those addressed in the CEC Final Decision for 00-AFC-14.

3.4.5 Laws, Ordinances, Regulations and Standards

The CEC Final Decision found the project to be in compliance with applicable geology and paleontology LORS. As described in this PTA, the proposed ESPFM is consistent with applicable geology and paleontology-related LORS and the Amendment will not alter the assumptions or conclusions in the CEC Final Decision and no additional or revised LORS compliance requirements have been identified.

3.4.6 Conditions of Certification

Existing COCs existing are adequate to address ESPFM, with the exception of the minor changes below that focus on the new entrance road. In addition, those COCs for which compliance has been demonstrated as part of 00-AFC-14C have been deleted and updates to regulatory standards are reflected as proposed changes. These COCs are provided below.

GEO-1: Prior to the start of construction, the project owner shall assign to the project an engineering geologist(s) and a geotechnical engineer(s) certified by the State of California, to carry out the duties required by the 2010 ~~2001~~ edition of the California Building Code (CBC) Appendix Chapter 33, Section 3309.4. The certified engineering geologist(s) and geotechnical engineer(s) assigned must be approved by the CBO and submitted to the Compliance Project Manager (CPM) for concurrence.

Verification: At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CPM) prior to the start of construction, the project owner shall submit to the CBO for approval the resume and license number(s) of the certified engineering geologist(s) and geotechnical engineer(s) assigned to the project. The submittal should include a statement that CPM concurrence is needed. The CBO and CPM will approve or disapprove of the engineering geologist(s) and geotechnical engineer(s) and will notify the project owner of its findings within 15 days of receipt of the submittal. If the engineering geologist(s) and geotechnical engineer(s) are subsequently replaced, the project owner shall submit for approval the resume(s) and license number(s) of the newly assigned individual(s) to the CBO and CPM. The CBO and CPM will approve or disapprove of the engineering geologist(s) and geotechnical engineer(s) and will notify the project owner of the findings within 15 days of receipt of the notice of personnel change.

GEO-2: Prior to the initiation of ground disturbance, the owner shall have a liquefaction analysis conducted for the power plant site and adjacent existing cut slope to the east. The liquefaction analysis shall be implemented by following the recommended procedures contained in *Recommended Procedures for Implementation of California Division of Mines and Geology Special Publication 117, Guidelines for Analyzing and Mitigating Liquefaction Hazards in California* dated March 1999. (The document is available through the Southern California Earthquake Center at the University of Southern California.)

Verification: The project owner shall include in the application for a grading permit (see Condition of Certification GEO-5) a report of the liquefaction analysis and a summary of how the results of this analysis were incorporated into the project foundation and grading plan design for the CBO's review and comment. A copy of the liquefaction analysis and summary of incorporated results shall be sent to the CPM prior to grading.

GEO-3: Prior to completion of the final design of the project, the owner shall have a slope stability analysis conducted for the existing cut slope east of Units 1 and 2 and 3 and 4. The analysis shall consider both static and earthquake conditions, as well as the effects of any liquefaction of the foundation soils. Since cohesionless soils may be present, the proposed 1.5:1 perimeter excavation should also be evaluated for stability, but only for static conditions.

Verification: The project owner shall include in the application for a grading permit (see Condition of Certification GEO-5 below) a report of the slope stability analysis and a summary of how the results of this analysis were incorporated into the project foundation and grading plan for the CBO's review and comment. A copy of the CBO's comments shall be sent to the CPM prior to grading.

GEO-4: Applicant shall designate and use a Coastal or Geotechnical Engineer, or geologist familiar with geomorphology, to conduct a shoreline monitoring program and assess erosion on the beach area and at the foot of the revetment on an annual basis for at least ten years. Applicant shall report such results to the CPM and California Coastal Commission annually. (Readers' note: Compliance with this COC is being implemented as part of ESEC and is not necessary to apply to ESPFM).

A detailed baseline survey is required, along with some historical research including air photos, a summary of past beach nourishment and shoreline damage. Sand sampling and testing shall be conducted. A series of onshore/offshore shore-normal transects every few hundred feet shall be conducted 4 times per year. Annually, photos from set positions can be taken (e.g. from the groin and from a high elevation in the plant). Shoreline response during and after a major storm will be documented.

After ten continuous years of monitoring, the owner shall prepare and submit a final report. The final report will serve as the annual report for year ten and will include a summary of findings over the 10-year period. Based on the ten-year summary report, the final report will include recommendations for either:

a. Continued monitoring on an annual basis in accordance with the established protocol if there is evidence of an adverse shoreline erosion condition;

b. Modifications to the monitoring program and continuation of the program, if modifications are warranted to increase, decrease, otherwise adjust the type and frequency of data collected; or,

c. Suspension of monitoring due to absence of an adverse shoreline erosion condition related to construction and operation of the ESPR.

Verification: At least thirty days prior to commencing construction, the Applicant shall designate the geologist and submit for approval the resumes of the engineer or geologist to the CBO and CPM. The engineer or geologist shall be experienced in shoreline monitoring, and understand coastal processes. Applicant shall submit as part of its annual compliance report the results of the assessment. Applicant shall also, at that time, forward the results to the California Coastal Commission and the City of El Segundo with a copy of the transmittal letter to the CPM. During the first 3 years following commencement of construction, the Applicant shall submit the above mentioned quarterly reports. The tenth annual report shall contain the final report.

GEO-5: The assigned engineering geologist(s) shall carry out the duties required by the 2010 ~~1998~~ CBC, Appendix Chapter 33, Section 3309.4 Engineered Grading Requirements, and Section 3318.1 – Final Reports. Those duties are:

a. Prepare the Engineering Geology Report. This report shall accompany the Plans and Specifications when applying to the CBO for the grading permit.

b. Monitor geologic conditions during construction.

c. Prepare the Final Engineering Geology Report.

The *Engineering Geology Report* required by the 2010~~1998~~ CBC Appendix Chapter 33, Section 3309.3 Grading Designation, shall include an adequate description of the geology of the site, conclusions, and recommendations regarding the effect of geologic conditions on the proposed development, and an opinion on the adequacy of the site for the intended use as affected by geologic factors.

The *Final Engineering Geology Report* to be completed after completion of grading, as required by the2010 ~~1998~~ CBC Appendix Chapter 33, Section 3318.1, shall contain the following: A final description of the geology of the site and any new information disclosed during grading; and the effect of same on recommendations incorporated in the approved grading plan. The engineering geologist shall submit a statement that, to the best of his or her knowledge, the work within their area of responsibility is in accordance with the approved Engineering Geology Report and applicable provisions of this chapter.

Verification:

1. Within 15 days after submittal of the application(s) for grading permit(s) to the CBO, the project owner shall submit a signed statement to the CPM stating that the Engineering Geology Report has been submitted to the CBO as a supplement to the plans and specifications and that the recommendations contained in the report are incorporated into the plans and specifications.

2. Within 90 days following completion of the final grading, the project owner shall submit copies of the Final Engineering Geology Report required by the 1998 CBC Appendix Chapter 33, Section 3318 Completion of Work, to the CBO and to the CPM.

GEO-6: The design for additional seawall or perimeter wall, including any necessary modifications to the existing seawall, shall be performed by a coastal engineer, geotechnical engineer, or engineering geologist, familiar with coastal processes and in accordance with the requirements of the California Coastal Commission Procedural Memo #19 (July 29, 1992).

If additional seawall is installed, performance of the seawall, with respect to shoreline erosion, will need to be addressed and verified in the shoreline monitoring program described under GEO-4. The wall should be textured and colored appropriately to minimize visual impacts.

Verification: Once a seawall design plan is available, the Applicant shall obtain approval of the design and construction methods from the CBO who will forward all approved plans and comments to the CPM. The CPM shall then forward this information to the Coastal Commission and the City of El Segundo.

PAL-1: The project owner shall provide the CPM with the resume and qualifications of its Paleontological Resource Specialist (PRS) and Paleontological Resource Monitors (PRMs) for review and approval. If the approved PRS or one of the PRMs is replaced prior to completion of project mitigation and report, the project owner shall obtain CPM approval of the replacement.

The resume shall include the names and phone numbers of contacts. The resume shall also demonstrate to the satisfaction of the CPM, the appropriate education and experience to accomplish the required paleontological resource tasks.

As determined by the CPM, the PRS shall meet the minimum qualifications for a vertebrate paleontologist as described in the Society of Vertebrate Paleontologists (SVP) guidelines of 1995. The experience of the PRS shall include the following:

a. Institutional affiliations or appropriate credentials and college degree;
b. Ability to recognize and recover fossils in the field;
c. Local geological and biostratigraphic expertise;
d. Proficiency in identifying vertebrate and invertebrate fossils;
e. Publications in scientific journals; and
f. The PRS shall have at least three years of paleontological resource mitigation and field experience in California, and at least one year of experience leading paleontological resource mitigation and field activities.

The PRS shall obtain qualified paleontological resource monitors to monitor as necessary on the project. Paleontological resource monitors (PRMs) shall have the equivalent of the following qualifications:

a. BS or BA degree in geology or paleontology and one year experience monitoring in California; or
b. AS or AA in geology, paleontology or biology and four years experience monitoring in California; or
c. Enrollment in upper division classes pursuing a degree in the fields of geology or paleontology and two years of monitoring experience in California.

Verification: 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.At least 20 days prior to ground disturbance, the PRS or project owner shall provide a letter with resumes naming anticipated monitors for the project and stating that the identified monitors meet the minimum qualifications for paleontological resource monitoring required by the condition. If additional monitors are obtained during the project, the PRS shall provide additional letters and resumes to the CPM for approval. The letter shall be provided to the CPM no later than one week prior to the monitor beginning on-site duties.

Prior to the termination or release of a PRS, the project owner shall submit the resume of the proposed new PRS to the CPM for review and approval.

PAL-2: The project owner shall provide to the PRS and the CPM, for approval, maps and drawings showing the footprint of the power plant and all linear facilities. Maps shall identify all areas of the project where ground disturbance is anticipated. If the PRS requests enlargements or strip maps for linear facility routes, the project owner shall provide copies to the PRS and CPM. The site grading plan and the plan and profile drawings for the utility lines would normally be acceptable for this purpose. The plan drawings should show the location, depth, and extent of all ground disturbances and can be 1 inch = 40 feet to 1 inch = 100 feet range. If the footprint of the power plant or linear facility changes, the project owner shall provide maps and drawings reflecting these changes to the PRS and CPM.

If construction of the project will proceed in phases, maps and drawings may be submitted prior to the start of each phase. A letter identifying the proposed schedule of each project phase shall be provided to the PRS and CPM. Prior to work commencing on affected phases, the project owner shall notify the PRS and CPM of any construction phase scheduling changes.

At a minimum, the PRS shall consult weekly with the project superintendent or construction field manager to confirm area(s) to be worked during the next week, until ground disturbance is completed.

Verification:

1. At least 30 days prior to the start of ground disturbance, the project owner shall provide the maps and drawings.
2. If there are changes to the footprint of the project, revised maps and drawings shall be provided at least 15 days prior to the start of ground disturbance.
3. If there are changes to the scheduling of the construction phases, the project owner shall submit a letter to the CPM within 5 days of identifying the changes.

PAL-3: The PRS shall prepare, and the project owner shall submit to the CPM for review and approval, a Paleontological Resources Monitoring and Mitigation Plan (PRMMP) to identify general and specific measures to minimize potential impacts to significant paleontological resources. Approval of the PRMMP by the CPM shall occur prior to any ground disturbance. The PRMMP shall function as the formal guide for monitoring, collecting and sampling activities and may be modified with CPM approval.

This document shall be used as a basis for discussion in the event that on-site decisions or changes are proposed. Copies of the PRMMP shall reside with the PRS, each monitor, the project owner's on-site manager, and the CPM.

The PRMMP shall be developed in accordance with the guidelines of the Society of the Vertebrate Paleontologists (SVP, 1995) and shall include, but not be limited to, the following:

1. Assurance that the performance and sequence of project-related tasks, such as any literature searches, pre-construction surveys, worker environmental training, fieldwork, flagging or staking; construction monitoring; mapping and data recovery; fossil preparation and recovery; identification and inventory; preparation of final reports; and transmittal of materials for curation will be performed according to the PRMMP procedures;
2. Identification of the person(s) expected to assist with each of the tasks identified within the PRMMP and all conditions for certification;
3. A thorough discussion of the anticipated geologic units expected to be encountered, the location and depth of the units relative to the project when known, and the known sensitivity of those units based on the occurrence of fossils either in that unit or in correlative units;
4. An explanation of why, how, and how much sampling is expected to take place and in what units. Include descriptions of different sampling procedures that shall be used for fine-grained and coarse-grained beds;
5. A discussion of the locations of where the monitoring of project construction activities is deemed necessary, and a proposed schedule for the monitoring;
6. A discussion of the procedures to be followed in the event of a significant fossil discovery, including notifications;
7. A discussion of equipment and supplies necessary for recovery of fossil materials and any specialized equipment needed to prepare, remove, load, transport, and analyze large-sized fossils or extensive fossil deposits;
8. Procedures for inventory, preparation, and delivery for curation into a retrievable storage collection in a public repository or museum, which meets the Society of Vertebrate Paleontologists standards and requirements for the curation of paleontological resources; and
9. Identification of the institution that has agreed to receive any data and fossil materials recovered, requirements or specifications for materials delivered for curation and how they will be met, and the name and phone number of the contact person at the institution; and,
10. A copy of the paleontological conditions of certification.

Verification: At least thirty (30) days prior to ground disturbance, the project owner shall provide a copy of the PRMMP to the CPM. The PRMMP shall include an affidavit of authorship by the PRS, and acceptance of the project owner evidenced by a signature.

PAL-4 Employee Awareness Training Program: Prior to ground disturbance and for the duration of construction, the project owner and the PRS shall prepare and conduct weekly CPM-approved training for all project managers, construction supervisors and workers who operate ground disturbing equipment or tools. Workers to be involved in ground disturbing activities in sensitive units shall not operate equipment prior to receiving worker training. The training program may be combined with other training programs prepared for cultural and biological resources, hazardous materials, or any other areas of interest or concern.

The Worker Environmental Awareness Program (WEAP) shall address the potential to encounter paleontological resources in the field, the sensitivity and importance of these resources, and the legal obligations to preserve and protect such resources. In-person training shall be provided for each new employee involved with ground disturbing activities, while these activities are occurring in highly sensitive geologic units, as detailed in the PRMMP. The in-person training shall occur within four days following a new hire for highly sensitive sites and as established by the PRMMP for sites of moderate, low, and zero sensitivity. Provisions will be made to provide the WEAP training to workers not fluent in English.

The training shall include:

1. A discussion of applicable laws and penalties under the law;
2. For training in locations of high sensitivity, the PRS shall provide good quality photographs or physical examples of vertebrate fossils that may be expected in the area;
3. Information that the PRS or PRM has the authority to halt or redirect construction in the event of a discovery or unanticipated impact to a paleontological resource;
4. Instruction that employees are to halt or redirect work in the vicinity of a find and to contact their supervisor and the PRS or PRM;
5. An informational brochure that identifies reporting procedures in the event of a discovery;
6. A Certification of Completion of WEAP form signed by each worker indicating that they have received the training; and
7. A sticker that shall be placed on hard hats indicating that environmental training has been completed.

Verification:

a. At least 30 days prior to ground disturbance, the project owner shall submit the proposed WEAP including the brochure with the set of reporting procedures the workers are to follow.

b. At least 30 days prior to ground disturbance, the project owner shall submit the script and final video to the CPM for approval if the project owner is planning on using a video for interim training.

c. If an alternate paleontological trainer is requested by the owner, the resume and qualifications of the trainer shall be submitted to the CPM for review and approval. Alternate trainers shall not conduct training prior to CPM authorization.

d. The project owner shall provide in the Monthly Compliance Report the WEAP copies of the Certification of Completion forms with the names of those trained, and the trainer, for each training offered that month. The Monthly Compliance Report shall also include a running total of all persons who have completed the training to date.

PAL-5: The PRS and PRM(s) shall monitor consistent with the PRMMP, all construction related grading, excavation, trenching, and auguring in areas where potentially fossil bearing materials have been identified. In the event that the PRS determines full time monitoring is not necessary in locations that were identified as potentially fossil-bearing in the PRMMP, the PRS shall notify and seek the concurrence of the CPM.

The PRS and PRM(s) shall have the authority to halt or redirect construction if paleontological resources are encountered. The project owner shall ensure that there is no interference with monitoring activities unless directed by the PRS. Monitoring activities shall be conducted as follows:

1. Any change of monitoring different from the accepted schedule presented in the PRMMP shall be proposed in a letter from the PRS and the project owner to the CPM prior to the change in monitoring. The letter shall include the justification for the change in monitoring and submitted to the CPM for review and approval.
2. PRM(s) shall keep a daily log of monitoring of paleontological resource activities. The PRS may informally discuss paleontological resource monitoring and mitigation activities with the CPM at any time.
3. The PRS shall immediately notify the project owner and the CPM of any incidents of non-compliance with any paleontological resources conditions of certification. The PRS shall recommend corrective action to resolve the issues or achieve compliance with the conditions of certification.
4. For any significant paleontological resources encountered, either the project owner or the PRS shall notify the CPM immediately (no later than the following morning after the find, or Monday morning in the case of a weekend) of any halt of construction activities.

Verification: The PRS shall prepare a summary of the monitoring and other paleontological activities that will be placed in the Monthly Compliance Reports. The summary will include the name(s) of PRS or monitor(s) active during the month; general descriptions of training and construction activities and general locations of excavations, grading, etc. A section of the report will include the geologic units or subunits encountered; descriptions of sampling within each unit; and a list of fossils identified in the field. A final section of the report will address any issues or concerns about the project relating to paleontologic monitoring including any incidents of non-compliance and any changes to the monitoring plan that have been approved by the CPM. If no monitoring took place during the month, the project shall include a justification in summary as to why monitoring was not conducted.

The PRS shall submit the summary of monitoring and paleontological activities in the Monthly Compliance Report.

PAL-6: The project owner, through the designated PRS, shall ensure the recovery, preparation for analysis, analysis, identification and inventory, the preparation for curation, and the delivery for curation of all significant paleontological resource materials encountered and collected during the monitoring, data recovery, mapping, and mitigation activities related to the project.

Verification: The project owner shall maintain in their compliance file copies of signed contracts or agreements with the designated PRS and other qualified research specialists. The project owner shall maintain these files for a period of three years after completion and approval of the CPM-approved PRR. The project owner shall be responsible to pay curation fees for fossils collected and curated as a result of paleontological monitoring and mitigation.

PAL-7: The project owner shall ensure preparation of a Paleontological Resources Report (PRR) by the designated PRS. The PRR shall be prepared following completion of the ground disturbing activities. The PRR shall include an analysis of the recovered fossil materials and related information and submitted to the CPM for review and approval.

The report shall include, but not be limited to, a description and inventory of recovered fossil materials; a map showing the location of paleontological resources encountered; determinations of sensitivity and significance; and a statement by the PRS that project impacts to paleontological resources have been mitigated.

Verification: Within ninety (90) days after completion of ground disturbing activities, including landscaping, the project owner shall submit the Paleontological Resources Report under confidential cover.

Certification of Completion of Worker Environmental Awareness Program
~~El Segundo Power Redevelopment Project~~ El Segundo Power Facility Modification (00-AFC-14C)

This is to certify these individuals have completed a mandatory California Energy Commission approved Worker Environmental Awareness Program (WEAP). The WEAP includes pertinent information on Cultural, Paleontology and Biology Resources for all personnel (i.e. construction supervisors, crews and plant operators) working on-site or at related facilities. By signing below, the participant indicates that they understand and shall abide by the guidelines set forth in the Program materials. Please include this completed form in your Monthly Compliance Report.

3.5 Hazardous Materials

This section describes and evaluates potential effects the proposed changes may have on hazardous materials storage and handling. Compliance with applicable LORS is also addressed.

3.5.1 Amendment Overview

As discussed in detail in Section 2.0, Project Description, this PTA proposes modifications to the ESEC that necessitate evaluation of environmental impacts and potential amendments to existing COCs. The proposed PTA is for decommissioning, demolishing, and replacing the existing Units 3 and 4 steam boiler plants with approximately 449 MW gross / 435 MW net of new natural-gas-fired electrical generating capacity, consisting of one combined-cycle train and two simple-cycle gas turbines. The air-cooled, combined-cycle train (CC Fast) will consist of a GTG (Unit 9), a an HRSG, and one STG (Unit 10), rated at 325 MW net. The simple cycle turbines (Units 11 and 12) will consist of two air-cooled Trent 60 ISE advanced aeroderivative gas turbines, each rated at 55 MW net / 58 MW gross. The GE turbine will be supported by a small (36 MMBtu/hr) auxiliary boiler that will be incorporated into the operation of the CC Fast. Removal of existing Units 3 and 4 will eliminate the remaining once-through ocean water cooling system at the ESGS site. The ESPFM will improve electricity generation by adding fast-start and dispatch flexibility capability to support southern California grid load balancing. Total site capacity (including the new equipment previously permitted) will not exceed 1,020 MW net—the rated capacity of previously retired Units 1 and 2, plus the capacity of the soon-to-be-retired Unit 3 and operating Unit 4, which will also be retired as part of the ESPFM.

3.5.2 Affected Environment

3.5.2.1 ESEC Amendments

The proposed ESPFM will result in modifications to the El ESEC license (00-AFC-14C). Decommissioning, demolishing, and removing existing Units 3 and 4 and replacing them with new Units 9, 10, 11, and 12 will not employ any new hazardous materials or generate new or additional wastes from those identified in the CEC's amended license for 00-AFC-14 and described in Section 2.0. Implementation of the ESPFM will require lower amounts of hazardous materials such as hydrazine; chlorine, a neutralizing amine to control dissolved oxygen and pH in the feed water; and sodium phosphate because these chemicals are associated with once-through cooling and are therefore no longer required. The elimination of once-through cooling also eliminates the need for chlorine to control biological growth. However, consistent with the current operating conditions at the ESGS site, the demolition and removal of Units 3 and 4 and the installation and operation of new Units 9, 10, 11, and 12 may result in minimal changes to the frequency of aqueous ammonia deliveries.

The ESPFM adds oxygenated treatment to support the air-cooled condenser. Oxygenated treatment reduces iron corrosion and transport to the HRSG. In addition, ammonia is required for pH control of the feed water as well as a peroxide solution to maintain oxygen concentrations in the condensate and feed water. While there is a potential for the ESPFM to result in changes in the frequency of ammonia deliveries, system upgrades and changes in operating conditions will not be required. Because of this change in treatment systems, the need for an oxygen scavenger (hydrazine) and neutralizing amine to control dissolved oxygen and pH in the feed water, as well as the use of sodium phosphate in the HRSG boiler water to control pH will be eliminated.

Implementation of new Units 9, 10, 11, and 12 will employ air-cooled condensers used for steam turbine exhaust stream heat rejection, which will rely on a mixed-bed resin system for treatment of make-up water for the water/steam cycle. The mixed-bed resin system is not regulated by the U.S. Department of Transporation when shipped domestically by land; however, it is listed an "immediate health hazard" under SARA Title III, and is considered a hazardous chemical as defined by OSHA Hazard Communication Standard, 29 CFR 1910.1200.

The Hazardous Materials Management Program subject to the approved COCs HAZMAT -1 through HAZMAT -3 is adequate to address any new potential impacts of the ESPFM. The following is a brief description of the areas covered by each existing COC:

- **HAZ-1** Hazardous Materials Inventory
- **HAZ-2** Business Plan Revision
- **HAZ-3** Risk Management Plan Revisions

ESEC LLC has implemented standard operating procedures that require that all hazardous materials storage, handling, use, and disposal be maintained to reflect current site conditions. As such, ESEC LLC will continue to comply with the requirements set forth in these COCs and will provide updates regarding the location of project components and implementation of onsite hazardous materials management programs, as necessary.

3.5.2.2 Hazardous Materials Storage and Use

The demolition and removal of Units 3 and 4 and the installation and operation of new Units 9, 10, 11, and 12 will result in minimal changes to the existing aqueous ammonia system as described in Section 2.0. There is a potential for the ESPFM to result in changes in the frequency of aqueous ammonia deliveries; however, system upgrades and changes in operating conditions will not be required. In addition, as described in Section 2.0, a variety of chemicals will be stored and used during construction and operation of the facility. The storage, handling, and use of these chemicals will be conducted in accordance with all applicable LORS and existing COCs. In addition, the removal of Units 3 and 4 and subsequent discontinuation of the once-through cooling system eliminates the need to store and use chlorine for biological growth control. The elimination of chlorine use will result in lower potential hazardous material handling impacts. Therefore, implementation of the ESPFM will result in lower potential for impacts from hazardous materials storage and use and implementation of existing mitigated by conformance with the requirements included in COCs HAZ-1 through HAZ-3.

3.5.2.3 Offsite Laydown and Parking Areas

The preferred offsite laydown area, located at 777 W. 190th Street in the City of Gardena, was incorporated into ESEC in the 2010 PTA decision and will continue to be used for ESPFM. Construction laydown and parking areas will also be established within the ESGS site boundary, as well as at offsite areas identified in the CEC Final Decision and shown on Figure 2-10. The 190th Street area is less than ten miles southeast of the ESGS and is easily accessible to the I-405 and I-110 North freeways from Vermont Avenue and 190th Street as well as to ESEC-approved traffic/truck routes. This site, zoned M2, commercial, has approximately ten usable acres and includes a 5,500 square-foot industrial building. The approximately 12.1-acre site paved with asphalt has nightlighting and includes a perimeter security fence. No site preparation other than minor clean-up is required prior to use. The existing COCs ensure that construction-related activities at the approved laydown areas will comply with appropriate hazardous materials storage and handling requirements and are adequate to address any potential impacts.

3.5.3 Cumulative Impacts

The proposed ESPFM covered under this PTA will require less hazardous materials and, therefore, will not result in any significant cumulative impacts from hazardous materials storage, use, or disposal beyond those addressed in the CEC's Final Decision (00-AFC-14).

3.5.4 Laws, Ordinances, Regulations, and Standards

The CEC Final Decision found the project to be in compliance with all applicable LORS. As described in this PTA, the proposed ESPFM is consistent with applicable hazardous materials handling-related LORS and the Amendment will not alter the assumptions or conclusions made in the CEC's Final Decision and no additional or revised LORS compliance have been identified.

3.5.5 Conditions of Certification

Existing COCs HAZ-1 through HAZ-3 are adequate to address the ESPFM without being amended with the exception of changing the identified Unit numbers and entity names. These COCs are provided below.

HAZ-1 Hazardous Materials Inventory: The project owner shall obtain the advance approval of the CPM if the facility intends to store, handle, use or move (or combination of these activities) a material, in quantities that exceed those specified in Title 40, CFR Part 355, Subpart J section 355.50.

Verification: The project owner shall provide to the CPM, in the Annual Compliance Report, a list of those hazardous materials designated as regulated substances as set forth in Title 40, CFR Part 355, Subpart J section 355.50. The list shall also include maximum quantities of these substances at the facility. Copies of the list should also be provided to the City of El Segundo Fire Department (CESFD) and the City of Manhattan Beach Fire Department (CMBFD).

HAZ-2 Business Plan Revision: The project owner shall update its existing Business Plan.

Verification: At least 45 days prior to the start-up of the ESPFM ~~ESPR~~ ~~project~~ Units 9, 10, 11, and 12 ~~5, 6 and 7~~, the owner shall undertake a hazardous materials floor plan exercise for each shift at the plant with the CESFD and provide a copy of the revised Business Plan, commented on by the CESFD, to the CPM. A copy of the revised Plan shall also be provided to the CMBFD.

HAZ-3 Risk Management Plan Revision: The project owner shall revise the existing CalARP Program Risk Management Plan (RMP). Similarly, the project owner shall also revise its existing RMP pursuant to the USEPA RMP Program. Both RMPs shall be expanded to include discussions to prevent and control the accidental release of ammonia from the pipeline. Those discussions shall elaborate on the various safety devices selected for the pipeline including double sleeve construction, provisions for backup safety devices, protective shut-in actions, emergency support systems, monitoring programs and personnel training, as a minimum. The shut-in actions shall include responses to pipeline overpressures and also leaks. Backup safety devices to be considered for the pipeline shall include sprinklers, sprays, deluge systems or equivalent systems. Special emphasis shall be placed on the deployment of such devices in the vicinity of the overpass at Vista Del Mar Boulevard in order to eliminate any vulnerabilities at that location.

Verification: At least 45 days prior to start-up of Units 9, 10, 11, and 12 ~~5, 6 and 7~~, the project owner shall furnish a final copy of each updated RMP to the CPM, CESFD and CMBFD. An initial draft of the CalARP RMP shall be provided to the CPM and the CESFD for review and comments. The final CalARP RMP shall be approved by the CPM. Similarly, an initial draft of the USEPA RMP shall be provided to the CPM and the CESFD for review and comments, at the time it is submitted to the USEPA for review. The final copy of the USEPA RMP shall reflect recommendations of the CPM and the CESFD.

3.6 Land Use

This section describes and evaluates potential effects the proposed changes may have on land uses. Land uses in the vicinity of the ESGS site were reviewed to assess whether there have been any changes since the CEC Final Decision in 2005 and the subsequent PTAs. Compliance with applicable LORS is also addressed.

3.6.1 Amendment Overview

As discussed in detail in Section 2.0, Project Description, this PTA proposes modifications to the ESEC that necessitate evaluation of environmental impacts and potential amendments to existing COCs. The proposed PTA is for decommissioning, demolishing, and replacing the existing Units 3 and 4 steam boiler plants with approximately 449 MW gross / 435 MW net of new natural-gas-fired electrical generating capacity, consisting of one combined-cycle train and two simple-cycle gas turbines. The air-cooled, combined-cycle train (CC Fast) will consist of a GTG (Unit 9), a an HRSG, and one STG (Unit 10), rated at 325 MW net. The simple cycle turbines (Units 11 and 12) will consist of two air-cooled Trent 60 ISE advanced aeroderivative gas turbines, each rated at 55 MW net / 58 MW gross. The GE turbine will be supported by a small (36 MMBtu/hr) auxiliary boiler that will be incorporated into the operation of the CC Fast. Removal of existing Units 3 and 4 will eliminate the remaining once-through ocean water cooling system at the ESGS site. The ESPFM will improve electricity generation by adding fast-start and dispatch flexibility capability to support southern California grid load balancing. Total site capacity (including the new equipment previously permitted) will not exceed 1,020 MW net—the rated capacity of previously retired Units 1 and 2, plus the capacity of the soon-to-be-retired Unit 3 and operating Unit 4, which will also be retired as part of the ESPFM.

3.6.2 Affected Environment

The ESPFM land use study area is bounded by the Pacific Ocean to the west and an area extending 1 mile from the site boundary. The project site is close to industrial, residential, commercial and open space uses. The ESGS site is consistent with existing and planned land uses as well as city zoning designations at and around the site. The recently released City of El Segundo Specific Plan, which specifies current zoning requirements for the downtown area of El Segundo (north of El Segundo Boulevard to Mariposa Avenue), did not impact the current zoning of the site.

Land uses in the vicinity of the ESGS site include the Chevron Marine Terminal to the north, where crude oil is offloaded from an underwater pipeline and transferred to the Chevron Oil Refinery, the largest refinery on the west coast; Hyperion Wastewater Treatment Plant, the largest wastewater treatment facility in the Los Angeles metropolitan area; and the Los Angeles Department of Water and Power Scattergood Generating Station, which is an 818 MW net electricity generating station with three generating units and a once-through cooling water system. North of the Chevron Refinery are residences in the City of El Segundo. Dockweiler State Beach is located to the northwest of the plant site. Los Angeles International Airport (LAX) is located approximately 2.5 miles north of the site. Residences and commercial uses within the City of Manhattan Beach, including a Manhattan Beach State Park are located south of the site. El Segundo City Beach and Santa Monica Bay (Pacific Ocean) are located west of the site.

The ESGS site is located within the City of El Segundo’s designated coastal zone. This portion of the City’s coastal zone consists of a narrow ribbon of land approximately 0.8 mile in length and 200 yards in width, for a total area of approximately 50 acres. The majority of this portion of the El Segundo’s coastal zone is industrially developed, as described above, in addition to a narrow shoreline and small retail service station. The narrow sandy beach west of ESGS and Chevron Terminal is publicly owned by the California State Lands Commission and is maintained by the County of Los Angeles (City of El Segundo, 1992). The County of Los Angeles maintains a bicycle path (South Bay Bike Trail) that runs along this narrow shoreline and connects with County bike paths in the city of Los Angeles to the north and the city of Manhattan Beach to the south. Public access to the beach is provided north of ESGS through Dockweiler State Beach. No designated scenic resources are identified within the study area. Operation of the existing facility, ESGS, subject to the CEC Final Decision 00-AFC-14 and subsequent amendments complies with Coastal Act Section 50260 which encourages use of existing coastal dependent industrial sites within the coastal zone. No major changes to the land use designations in the vicinity of the ESGS site have occurred since preparation of 00-AFC-14 and the subsequent PTAs.

3.6.3 ESEC Amendments

The proposed ESPFM will result in modifications to the ESEC license (00-AFC-14C). Decommissioning, demolishing, and removing existing Units 3 and 4 and replacing them with new Units 9, 10, 11, and 12 will not result in new land use impacts above those identified in the CEC's amended license for 00-AFC-14 and as described in Section 2.0. Implementing the project changes proposed in the PTA, including the decommissioning, demolishing, and removing existing Units 3 and 4; installing Units 9, 10, 11, and 12; and constructing a new combined use administrative building will not result in increases in land use impacts from those identified in the CEC's amended license for 00-AFC-14C.

There are currently 14 COCs that apply to these ESEC modifications described in this PTA. Of these conditions, several require minor changes to ensure that the work to implement the project changes is properly regulated and that no significant adverse environmental impacts occur. Proposed changes are explained. Several COCs were never used or are no longer applicable. As such, project owner proposes that they be deleted. The following list of existing COCs also includes the rational for changes to appropriately address mitigating potential impacts associated with implementation of the ESPFM.

LAND-1 Conformance with Local Jurisdiction Requirements – ***Proposed Change:*** Ongoing compliance with this COC is recommended for the changes proposed by this PTA. Project owner proposes a minor change to this CEC to specify the requirements listed in this COC remain in effect for the ESPFM.

LAND-2 Confirmation of Staging Areas – ***Proposed Change:*** Ongoing compliance with this COC is recommended for the changes proposed by this PTA. Project owner proposes a minor change to this CEC to specify the requirements listed in this COC remain in effect for the ESPFM. Offsite staging and laydown is planned to accommodate ESPFM changes.

LAND-3 Exhaust Stack FAA Marking/Lighting – ***No Change:*** This COC is written such that ongoing compliance is required for all new exhaust stacks at ESEC. Thus, it is already written in a manner that will require it be complied with for the ESPFM changes.

LAND-4 Sewer Line Construction – ***No Changes – Proposed Deletion:*** This COC relates to the construction of a sewer pipeline interconnection. There are no proposed sewer pipeline or connection plans as part of the ESPFM and therefore, consideration of deleting this COC is warranted.

LAND-5 Notification of Use of Abandoned Fuel Tank Farm (Parcel 2) – ***No Change:*** This COC is written such that ongoing compliance is required in the event that Parcel 2 is used to accommodate ESPFM components and therefore, should remain in effect.

LAND–6 Use of Parcel 2 Abandoned fuel storage tank area – ***No Change :*** This COC is written such that ongoing compliance is required in the event that the abandoned storage tank area is used to accommodate ESPFM components and therefore, should remain in effect.

LAND-7 Final Grading and Drainage Plans – ***Proposed Change:*** Ongoing compliance with this COC is recommended for the changes proposed by this PTA. Project owner proposes a minor change to this CEC to specify the requirements listed in this COC remain in effect for the ESPFM.

LAND–8 California State Lands Commission Lease – ***No Changes:*** This COC relates to use of lands subject to leases from the State Lands Commission. With the proposed changes in the PTA, once-through cooling and other direct power plant relations to State Lands will terminate. Further, the beach delivery option was never selected and therefore this condition has not become applicable and is now outdated and not required. Nonetheless, ESEC LLC will provide the relevant copy of the lease to the CEC

LAND–9 Perimeter Landscaping – ***No Change:*** The proposed changes to ESEC in the PTA do not necessitate any changes to perimeter landscaping and public use. For that reason, this condition does not require any changes for the PTA.

LAND-10 Bikeway Construction Notifications – *Proposed Change:* This COC contains language related to the beach delivery option that was never implemented. The condition has proven useful regarding any needed interuptions to the bike path. For that reason, rather than proposing deletion since beach delivery was not selected, project owner proposes slightly amending the condition to make it generally applicable when bike path must be blocked.

LAND-11 Bikeway Restoration – *No Change:* This COC should continue to be adhered to if and when the project is obligated to disturb the conditions of the bike path. The condition is written now to be generally applicable.

LAND-12 Beach Restoration- *Proposed Deletion:* This COC was proposed specifically and only in case the beach delivery option was selected. Since that option was not selected to construct Units 5, 6, 7 and 8, this condition was never implemented and never will be. Thus, it should be deleted.

LAND-13 California State Lands Commission Lease – *Proposed Deletion:* This COC was proposed specifically and only in case the beach delivery option was selected. Since that option was not selected to construct Units 5, 6, 7 and 8, this COC was never implemented and never will be. Thus, it should be deleted.

LAND-14 Emergency Service Vehicle and Equipment Passage – *Proposed Deletion:* This COC was proposed specifically and only in case the beach delivery option was selected. Since that option was not selected to construct Units 5, 6, 7 and 8, this COC was never implemented and never will be. Thus, it should be deleted.

ESEC LLC will continue to comply with the requirements set forth in these COCs.

3.6.4 Environmental Analysis

As discussed in Section 2.0, Project Description, the demolition and removal of Units 3 and 4 and the installation and operation of new Units 9, 10, 11, and 12 will result in similar grading, excavation, foundation, and underground infrastructure activities as were required for the demolition of Units 1 and 2 and the construction of Units 5 through 8. Furthermore, because subsurface activities required for the ESPFM are expected to occur in areas of the site that have been previously disturbed as part of historical power plant operations at the site, including the most current subsurface activities required for the demolition of Units 1 and 2 and construction of Units 5 through 8, no impacts beyond those described in 00-AFC-14 are anticipated. Therefore, the resource protection measures included in existing COCs LAND-1 through LAND-3 and LAND-5 through LAND-11 are adequate to address potential land use impacts, and the ESPFM demolition and construction activities will be conducted in accordance with these COCs all applicable LORS.

3.6.4.1 Offsite Construction Laydown and Construction Worker Parking Areas

The preferred offsite laydown area, located at 777 W. 190th Street in the City of Gardena, was incorporated into ESEC in the 2010 PTA decision and will continue to be used for ESPFM. Construction laydown and parking areas will also be established within the ESGS site boundary, as well as at offsite areas identified in the CEC Final Decision and shown on Figure 2-10. The 190th Street area is less than ten miles southeast of the ESGS and is easily accessible to the I-405 and I-110 North freeways from Vermont Avenue and 190th Street as well as to ESEC-approved traffic/truck routes. This site, zoned M2, commercial, has approximately ten usable acres and includes a 5,500 square-foot industrial building. The approximately 12.1-acre site paved with asphalt has nightlighting and includes a perimeter security fence. No site preparation other than minor clean-up is required prior to use. The intended use of this site for construction laydown and parking is consistent with the current use of the property and is not in conflict with surrounding properties and businesses. Furthermore, the existing COCs ensure that land use-related activities at the laydown areas will comply with existing land use plans and policies.

3.6.5 Cumulative Impacts

The proposed project changes will not result in any significant cumulative impacts to land use beyond those addressed in the CEC Final Decision (00-AFC-14). As part of preparation of this PTA, the relevant planning agencies were contacted and confirmed that there are no planned actions that would interfere with maintaining the land use conformance of ESPFM and, therefore, there will be no cumulative impacts. The project owner will continue to work closely with Los Angeles County and local cities to monitor and anticipate any future community organized events such as charity walks, bike rides, or clean-ups to minimize the impact of disruption of the bike path from construction or operation of the ESPFM.

3.6.6 Laws, Ordinances, Regulations, and Standards

The CEC Final Decision found the project to be in compliance with all applicable LORS. As described in this PTA, the proposed ESPFM is consistent with applicable land use-related LORS and the Amendment will not alter the assumptions or conclusions made in the CEC's Final Decision and no additional or revised LORS compliance have been identified.

3.6.7 Conditions of Certification

Land use impacts are subject to approved COCs LAND-1 through LAND-3 and LAND-5 through LAND-11 are adequate to address any new potential impacts of ESPFM. COCs LAND-4 and LAND 12 through LAND-14 are specific to components that have been fully implemented subject to the CEC FINAL Decision (00-AFC-14). The analysis concludes that only revisions to the COCs, removing those where compliance has been completed, set forth in the previously permitted project are necessary and no new COCs are required. These COCs are provided below.

Proposed changes to the land use COCs are provided below using strikethrough (~~text~~) to show text proposed for deletion and underlining (<u>text</u>) to show text proposed to be added. Several conditions require slight adjustment to facilitate the proposed changes to the facility and ensure that ESEC continues to have no significant adverse impacts.

LAND-1 Conformance with Local Jurisdiction Requirements – ***Proposed Change***
LAND-2 Confirmation of Staging Areas – ***Proposed Change***
LAND-3 Exhaust Stack FAA Marking/Lighting – ***No Change***
LAND-4 Sewer Line Construction – ***No Change***
LAND-5 Notification of Use of Abandoned Fuel Tank Farm (Parcel 2) – ***No Changes***
LAND–6 Use of Parcel 2 Abandoned fuel storage tank area – ***No Changes***
LAND-7 Final Grading and Drainage Plans – ***Proposed Change***
LAND–8 California State Lands Commission Lease – ***No Change***
LAND–9 Perimeter Landscaping – ***No Change***
LAND-10 Bikeway Construction Notifications – ***Proposed Change***
LAND-11 Bikeway Restoration – ***No Change***
LAND-12 Beach Restoration - ***Proposed Deletion***
LAND-13 California State Lands Commission Lease – ***Proposed Deletion***
LAND-14 Emergency Service Vehicle and Equipment Passage – ***No Change***

The rationale for these changes was provided in section 3.6.3 above. The proposed changes to the land use COCs are:

LAND-1: The project owner shall ensure that the project and its associated facilities are in compliance with the affected local jurisdiction's applicable adopted county or municipal code requirements for the project site's development (e.g., setbacks, zone district requirements, design criteria, height, sign requirements, etc.). <u>The project owner shall also ensure the same local jurisdictional requirement compliance for the ESPFM changes.</u>

The project owner shall submit to the applicable city/county planning department for review and comment, a development plan showing site dimensions, design and exterior elevation(s) and any other item(s) that may be required by the local jurisdiction's planning department to conduct a ministerial review of the project and its associated facilities in accordance with the jurisdiction's site development requirements. The city/county planning department shall have 60 calendar days to review the plan(s) and provide written comments to the project owner. The project owner shall provide a copy of the city/county planning department's written comments and a copy of the development plan to the CPM.

Verification: At least 90 calendar days prior to the site mobilization on the power plant project site and its associated facilities, and also for the ESPFM changes, the project owner shall submit the proposed development plan to the affected jurisdiction for review and comment. The project owner shall provide any comment letters received from the local jurisdiction along with the proposed development plan to the CPM for review and approval.

LAND-2: The project owner shall identify the secured lay down/staging area(s) for the project prior to site mobilization and shall also identify the secured lay down/staging area(s) for the ESPFM changes, The project owner shall provide a plot plan and location map showing the lay down/staging area(s) to the affected local jurisdiction(s) planning department(s) (i.e. County of Los Angeles, the City of El Segundo, City of Manhattan Beach, etc.) and to the Executive Director of the California Coastal Commission if located within the State designated Coastal Zone for review and comment. The local jurisdiction(s) and the Executive Director (if applicable) shall have 60 calendar days to review the lay down/staging area(s) and provide written comments to the project owner. The project owner shall provide a copy of the local jurisdiction's and the Executive Director's (if applicable) written comments and a copy of the secure lay down/staging area(s) to the CPM for review and approval.

Verification: The project owner shall provide a copy of the lay down/staging area(s) to the affected local jurisdiction and the Executive Director of the California Coastal Commission (if applicable) for written comment. At least 30 days prior to the start of site mobilization, the project owner shall provide any plan(s), map(s) showing the secured laydown and staging area(s) along with any comment letters from the local jurisdiction and the California Coastal Commission to the CPM for review and approval.

LAND-3: The project owner shall provide appropriate evidence of compliance with Federal Aviation Administration (FAA) regulations regarding the marking and/or lighting of the project's new exhaust stacks.

Verification: Pursuant to the schedule contained in Condition of Certification TRANS-6, the project owner shall submit copies of the FAA Form 7460-1 with copies of the FAA response to Form 7460-1 to the CPM.

LAND-4: The project owner shall either bore the proposed sewer line under 45th Street in the City of Manhattan Beach or use conventional excavation techniques using steel cover plates to allow traffic to have access to the Strand parking lot at all times. The time period necessary to complete the 45th Street sewer excavation/trenching and connection shall be kept to a minimum. The Applicant shall obtain the required encroachment permit(s) from the local government of jurisdiction(s). The sewer line shall be constructed during the off-peak season of September to May. (Readers' note: Compliance with this COC is being implemented as part of ESEC and is not necessary to apply to ESPFM).

Verification: The project owner shall submit to the City of Manhattan Beach Public Works Department an encroachment permit application for their review and approval and to the CPM for final approval. The permit application shall include a description of the method that would be used to complete any excavations in 45th Street. The application shall include the proposed time to begin and complete the sewer line connection. Also, the permit application shall illustrate how the construction crew and traffic control will ensure that access to the parking lot is not disrupted.

The project owner shall monitor the construction of the sewer line in the 45th Street right-of-way at all times and promptly notify the City of Manhattan Beach Public Works Department and CPM of any difficulties experienced.

Prior to any ground disturbance within the 45th Street public right-of-way a copy of the City of Manhattan Beach approved/issued encroachment permit shall be submitted to the CPM. The CPM or City of Manhattan Beach designated representative may conduct random site visits to verify compliance, and the CPM may temporarily stop construction to ensure access is maintained.

LAND-5: The project owner shall provide written notification to the CPM when any plans for use of the abandoned fuel tank farm area (Parcel 2) are developed and indicate whether the project owner believes such plans are subject to the Energy Commission's permitting authority in accordance to the Warren-Alquist Act. The written notification shall include a description of the development and an analysis of which agency has proper jurisdiction over the development according to the enacted laws, ordinances and standards in effect at the time such development is to be proposed.

Verification: The project owner shall provide written notification to the planning departments of the City of El Segundo and the City of Manhattan Beach and to the Executive Director of the California Coastal Commission who shall have 30 calendar days to provide written comments to the CPM to review. At least 60 days prior to submitting any applications to any other agency for development of the abandoned fuel tank farm area (Parcel 2); the project owner shall provide a copy of the written notification to the CPM. The project owner shall also provide copies of the written notification sent to the Cities of El Segundo, Manhattan Beach and to the Executive Director of the California Coastal Commission to the CPM.

LAND–6: The abandoned fuel storage tanks on Parcel 2 shall be removed prior to the start of commercial operation of the new generating units. Any site remediation and/or soil restoration activities required by appropriate authorities shall be completed following tank removal. (Readers' note: Compliance with this COC is being implemented as part of ESEC and is not necessary to apply to ESPFM).

Following site remediation, the tank farm area shall be paved and landscaped in accordance with the landscape plan submitted and approved pursuant to condition of certification, VIS-2. The tank farm uses will be restricted to parking in the designated parking areas and approved uses in the paved area south of the designated parking area. Approved uses include temporary equipment staging and overflow parking during maintenance evolutions. The paved area shall not be used for permanent storage of vehicles, equipment or materials.

Verification: The project owner shall submit a detailed schedule for the removal of the fuel storage tanks, site remediation and/or soil restoration to the CPM for review and approval prior to the start of construction.

LAND-7: The project owner shall provide copies of final grading and drainage plans to the planning departments of the Cities of El Segundo and Manhattan Beach. This requirements shall also apply to the ESPFM changes

Verification: Pursuant to the schedule contained in Condition of Certification CIVIL-1 the project owner shall also submit copies of the proposed drainage structures and grading plan to the City of El Segundo planning department and the City of Manhattan Beach planning department concurrent with their submittal to the Chief Building Official (CBO) and CPM.

~~**LAND–8**: The project owner shall maintain lease rights for the tideland and submerged land owned by the State of California leased via the California State Lands Commission.~~

~~Project owner shall provide copies to the CPM of all new or amended leases and all relevant correspondence between the project owner and the State Lands Commission regarding lease terms.~~

~~**Verification**: The project owner shall provide the CPM with a copy of submitted lease applications filed with the State Lands Commission and other relevant correspondence. The project owner shall submit to the CPM a copy of all new or amended lease agreements with the California State Lands Commission.~~

LAND–9: The project owner shall provide copies of the final perimeter landscape plan(s) to the CPM. The landscape plans shall identify the area to be designated for public use, subject to restrictions for security and public safety as determined by the CPM. The project owner shall install public park-type benches within the public use area along the west property line of the ESGS property.

Verification: The public park-type benches shall be installed pursuant to the schedule contained in Condition of Certification VIS-2. Within 14 days after completion of the public use area, the project owner shall contact the CPM to request a final inspection.

LAND-10: The project owner shall not prohibit public access and use of the Los Angeles County maintained Class 1 bicycle trail known as the "Marvin Braude Bikeway" (bikeway) ~~during beach delivery activities~~ except as stipulated below for the project:

A. Prior to the start of pre-construction activity involving the bikeway, the project owner shall contact the Los Angeles County Department of Public Works and provide for its review a schedule for bike trail closure and trail use interruption, the detour route, the location of delineators or barricades to channelize individuals past the work site, and the placement of public signage (e.g., construction warning signs).

B. Prior to the first closure of the bikeway to perform necessary project pre- construction or construction activity, the project owner shall:

   a. Provide the final schedule and timing of bike trail closures to the Department of Public Works Construction Division and Bikeway Coordinator, and CPM.

   b. Provide a detour plan to the Department of Public Works Construction Division, Bikeway Coordinator and CPM showing a safe bicycle route around the project site for bicyclists.

   c. Provide the Department of Public Works Construction Division and Bikeway Coordinator 30-calendar days to review and provide written comments to the project owner on a. and b. above.

   d. Provide to the CPM a copy of the transmittal letter submitted to the Department of Public Works Construction Division and Bikeway Coordinator requesting their review of the items identified in a. and b. above.

   e. Provide to the CPM a copy of the Department of Public Works Construction Division and Bikeway Coordinator written comments on the items identified in a. and b. above for approval.

   f. Notify the Bikeway Coordinator within 24-hours after any reopening of the bikeway.

C. If the bikeway's existing width must be reduced in size to perform necessary project construction activity, the project owner shall provide the following:

   Eight (8) feet of bicycle trail width shall be maintained around the project site to the greatest extent possible. The project owner shall post construction signs warning "CONSTRUCTION AHEAD" and "BIKEWAY NARROWS" in advance of the project site on all approaches along with delineators and barricades for channelization.

   If a minimum of eight feet of paved bicycle trail cannot be provided, construction signs warning "CONSTRUCTION AHEAD" and "WALK BIKE" shall be posted in advance of the project site on all approaches. Where bicyclists are instructed to walk their bikes, flagmen shall be present at all approaches. Delineators or barricades shall also be placed to channelize pedestrians past the work site.

   Vertical clearance to obstructions across the clear width of the bicycle trail shall be a minimum of 8 feet.

D. Required public signage shall be posted at least 14-calendar days prior to the start of pre-construction activity involving the bikeway. The Department of Public Works Construction Division and Bikeway Coordinator, and the CPM shall be notified that signage has been installed within 24-hours after posting.

E. To the extent feasible, the project owner shall make the bicycle trail open to the public on weekends and holidays. The bicycle trail shall be completely free of obstructions including barricades, swept clean, and have a minimum of eight-feet of vertical clearance with a two-foot wide shoulder. If a two-foot wide shoulder cannot be maintained, the project owner shall provide warning signage.

F. Within 48-hours after receiving a bicycle related trail complaint specific to the project's bikeway pre-construction and construction activities, the project owner shall provide the CPM with a complaint resolution form report as specified in the Compliance General Conditions and a written explanation of the resolution to the complaint.

Verification: At least 30 days prior to start of pre-construction activity involving the bikeway, the project owner is to contact the Los Angeles County Department of Public Works Construction Division and Bikeway Coordinator.

The project owner is to provide to the CPM a copy of the transmittal letter submitted to the Department of Public Works Construction Division and the Bikeway Coordinator requesting their review.

The project owner is to provide to the CPM a copy of the written comments provided by the Department of Public Works Construction Division and the Bikeway Coordinator on the scheduled for bike trail closure and trail use interruption, the detour route, the installation of public signage and notification.

LAND-11 Bikeway Restoration: The project owner shall complete restoration or repair of bicycle trail pavement (including striping) to the bikeway's preconstruction condition consistent with the schedule established for the completion of the seawall pursuant to Condition of Certification VIS-3 found in the visual resources section of the Commission Decision dated February 2, 2005.

The project owner shall contact the Los Angeles County Department of Public Works Construction Division and the CPM for a site inspection after the project owner has restored/repaired the bicycle trail to its pre-construction condition.

If upon completion of the site inspection by the Los Angeles County Department of Public Works Construction Division and the CPM, the CPM notifies the project owner that additional restoration/repair is needed; within 30 days of receiving the notification the project owner shall complete the specified work.

Verification: The project owner is to notify the Los Angeles County Department of Public Works Construction Division and the CPM upon completion of the restoration/repair of the bicycle trail that it is ready for inspection.

~~**LAND-12 Beach Restoration** The project owner shall remove all evidence of the project's beach delivery area structures and equipment (e.g., beach ramp, safety/security fencing, dozers, etc.), and restore the beach surface area to its original condition or better condition, including the replacement of any sand, vegetation, or paving that was removed to permit the project's beach delivery phase where project development does not preclude it.~~

~~The project owner shall record in video format the beach delivery laydown area prior to pre-construction activity and after the restoration completed. The project owner shall submit copies of both the pre- and post-video recordings to the CPM.~~

~~The project owner shall complete surface restoration of the beach area within 60 calendar days after the start of commercial operation. The project owner shall notify the CPM within seven days after completion of surface restoration that the beach area is ready for inspection. If the CPM notifies the project owner that additional surface restoration is needed after the site inspection, within 30 days of receiving that notification the project owner shall complete the specified work.~~

~~**Verification**: At least 15 days prior to the start of pre-construction on the beach, the project owner is to video the beach delivery laydown area and provide a copy of it to the CPM.~~

~~The project owner is to notify the CPM within seven days after completion of the beach restoration that it is ready for inspection and provide the CPM with a video/DVD showing the restored beach area.~~

~~**LAND-13 California State Lands Commission Lease:** Prior to the start of the project's pre-construction activity on the beach, the project owner shall provide the CPM a copy of their executed lease or equivalent land use document with the California State Lands Commission permitting barge anchorage, and the storage and transfer of oversized power plant equipment (e.g., steam turbine generators, heat recovery steam generators, air-cooled condensers) to the project site.~~

~~**Verification**: At least 15 days prior to the start of pre-construction activity on the beach, the project owner is to provide the CPM a copy of their executed lease or equivalent land use document with the California State Lands Commission.~~

~~**LAND-14 Emergency Service Vehicle and Equipment Passage:** The project owner shall allow the Los Angeles County Department of Beaches and Harbors, Facilities and Property Management Division, and the Los Angeles County Fire Department, Lifeguard Division, heavy equipment and emergency services vehicle passage through the project's beach delivery area, and the Marvin Braude Bikeway to respond to beach related emergencies (e.g.; oil spills, sewage spillage fouling the shoreline, beach erosion, high tides, mammal rescue), and to conduct lifesaving operations and paramedic services.~~

~~Prior to the start of pre-construction activity on the beach, if the project owner cannot provide heavy equipment/emergency services vehicle passage, the project owner may submit to the CPM for approval an alternative option that provides for the movement of heavy equipment and emergency services vehicles that has~~

~~been reviewed by the Chief of Facilities and Property Management Division for the Los Angeles County Department of Beaches and Harbors and the Chief Lifeguard of the Los Angeles County Fire Department.~~

~~If the CPM determines that the heavy equipment/emergency services vehicle passage or the alternative option requires a revision, the project owner shall revise the heavy equipment/emergency services vehicle passage or alternative option and submit it to the CPM for approval.~~

~~The heavy equipment/emergency services vehicle passage or alternative option shall remain in effect until the beach ramp and fencing prohibiting passage of heavy equipment and emergency service vehicles through the project's beach delivery area are cleared from the beach.~~

~~**Verification**: At least 30 calendar days prior to the start of the project's pre- construction activity on the beach, the project owner is to contact the Chief of Facilities and Property Management Division for the Los Angeles County Department of Beaches and Harbors, and the Chief Lifeguard of the Los Angeles County Fire Department to formalize the heavy equipment/emergency services vehicles passage or alternative option. At least 10 days prior to the start of pre-construction activity on the beach, the project owner is to provide to the CPM a map showing the agreed upon heavy equipment/emergency services vehicle passage or alternative option.~~

3.7 Noise and Vibration

This section describes and evaluates potential effects the proposed changes may have on nosie setting. Noise receptors and sources in the vicinity of the ESGS site were reviewed to assess whether there have been any changes since the CEC Final Decision in 2005 and the subsequent PTAs.Compliance with applicable LORS is also addressed.

3.7.1 Amendment Overview

As discussed in detail in Section 2.0, Project Description, this PTA proposes modifications to the ESEC that necessitate evaluation of environmental impacts and potential amendments to existing COCs. The proposed PTA is for decommissioning, demolishing, and replacing the existing Units 3 and 4 steam boiler plants with approximately 449 MW gross / 435 MW net of new natural-gas-fired electrical generating capacity, consisting of one combined-cycle train and two simple-cycle gas turbines. The air-cooled, combined-cycle train (CC Fast) will consist of a GTG (Unit 9), a an HRSG, and one STG (Unit 10), rated at 325 MW net. The simple cycle turbines (Units 11 and 12) will consist of two air-cooled Trent 60 ISE advanced aeroderivative gas turbines, each rated at 55 MW net / 58 MW gross. The GE turbine will be supported by a small (36 MMBtu/hr) auxiliary boiler that will be incorporated into the operation of the CC Fast. Removal of existing Units 3 and 4 will eliminate the remaining once-through ocean water cooling system at the ESGS site. The ESPFM will improve electricity generation by adding fast-start and dispatch flexibility capability to support southern California grid load balancing. Total site capacity (including the new equipment previously permitted) will not exceed 1,020 MW net—the rated capacity of previously retired Units 1 and 2, plus the capacity of the soon-to-be-retired Unit 3 and operating Unit 4, which will also be retired as part of the ESPFM.

3.7.2 Affected Environment

The ESPFM noise and vibration study area is the same as described in the 00-AFC-14. The recently released City of El Segundo Specific Plan, which specifies current zoning requirements for the downtown area of El Segundo (north of El Segundo Boulevard to Mariposa Avenue), did not impact the current zoning of the ESGS. Land uses in the vicinity of the ESGS site include the Chevron Marine Terminal to the north, where crude oil is offloaded from an underwater pipeline and transferred to the Chevron Oil Refinery, the largest refinery on the west coast; Hyperion Wastewater Treatment Plant, the largest wastewater treatment facility in the Los Angeles metropolitan area; and the Los Angeles Department of Water and Power Scattergood Generating Station, which is an 818 MW net electricity generating station with three generating units and a once-through ocean water cooling system. North of the Chevron Refinery are residences in the city of El Segundo. Dockweiler State Beach is located to the northwest of the plant site. Los Angeles International Airport (LAX) is located approximately 2.5 miles north of the site. Residences and commercial uses within the city of Manhattan Beach, including the Manhattan Beach State Park are located south of the ESGS site. El Segundo City Beach and Santa Monica Bay (Pacific Ocean) are located west of the ESGS site.

The County of Los Angeles maintains the bicycle path (South Bay Bike Trail) that runs along this narrow shoreline and connects with County bike paths in the city of Los Angeles to the north and the city of Manhattan Beach to the south. Public access to the beach is provided north of the ESGS site through Dockweiler State Beach. Operation of the existing facility, ESGS, is subject to the CEC Final Decision 00-AFC-14. Existing COC NOISE-6 required additional preconstruction community noise monitoring to further document existing sound levels. This monitoring was conducted during the months of August, September, and October 2003 and filed with the CEC as required by NOISE-6.

3.7.3 ESEC Amendments

The proposed ESPFM will result in modifications to the ESEC license (00-AFC-14C). Decommissioning, demolishing, and removing existing Units 3 and 4 and replacing them with new Units 9, 10, 11, and 12 will not result in new noise impacts beyond those identified in the CEC's amended license for 00-AFC-14C and as described in Section 2.0. The following is a brief description of the areas covered by the existing COCs:

- **NOISE-1** Neighboring Property Owner Notification
- **NOISE-2** Noise Complaint Resolution Process
- **NOISE-3** Occupational Noise Control Program
- **NOISE-4** Low-Pressure Steam Blows
- **NOISE-5** Steam Blow Notification
- **NOISE-6** Operational Noise Limits
- **NOISE-7** Occupational Noise Survey
- **NOISE-8** Construction Noise Limits
- **NOISE-9** Vibration Limits
- **NOISE-10** Loudspeaker Restrictions

ESEC LLC will continue to comply with the requirements set forth in these COCs.

3.7.4 Environmental Analysis

As discussed in Section 2.0, Project Description, the demolition and removal of Units 3 and 4 and the installation and operation of new Units 9 through 12 will result in similar grading, excavation, foundation, and underground infrastructure activities as were required for the demolition of Units 1 and 2 and the construction of Units 5 through 8. ESPFM demolition, construction, and operations will be conducted in accordance with the existing COCs.

3.7.4.1 Offsite Construction Laydown and Construction Worker Parking Areas

The preferred offsite laydown area, located at 777 W. 190th Street in the City of Gardena, was incorporated into ESEC in the 2010 PTA decision and will continue to be used for ESPFM. Construction laydown and parking areas will also be established within the ESGS site boundary, as well as at offsite areas identified in the CEC Final Decision and shown on Figure 2-10. The 190th Street area is less than ten miles southeast of the ESGS and is easily accessible to the I-405 and I-110 North freeways from Vermont Avenue and 190th Street as well as to ESEC-approved traffic/truck routes. This site, zoned M2, commercial, has approximately ten usable acres and includes a 5,500 square-foot industrial building. The approximately 12.1-acre site paved with asphalt has nightlighting and includes a perimeter security fence. No site preparation other than minor clean-up is required prior to use. The use of this site for construction laydown and parking is consistent with the current use of the property and is not in conflict with surrounding properties and businesses. The existing COCs ensure that construction-related noise impacts from using this offsite storage and parking area complies with existing noise regulations.

3.7.5 Cumulative Impacts

The proposed ESPFM will not result in any significant cumulative noise impacts beyond those addressed in the CEC Final Decision (00-AFC-14). As part of preparation of this PTA, the relevant planning agencies were contacted and confirmed that there are no planned actions that would interfere with maintaining conformance of the ESPFM with noise regulations and, therefore, there will be no cumulative impacts. The project owner will continue to work closely with the cities of El Segundo, Manhattan Beach, and Los Angeles, and Los Angeles County to monitor and anticipate any future community organized events such as charity walks, bike rides, or clean-ups to minimize potential noise impacts to bike path users from construction or operation of the project.

3.7.6 Laws, Ordinances, Regulations, and Standards

The CEC's 2005 Decision and 2010 Amended Decision found the ESEC project and its predecessor ESPR project to be in compliance with all applicable LORS. As described in this PTA, the proposed ESPFM will comply with the existing COCs established by the CEC's Final Decision and the Amendment will not alter the assumptions or conclusions in the CEC Final Decision and no additional or revised LORS compliance have been identified.

3.7.7 Conditions of Certification

The ESPFM will comply with the existing COCs NOISE-1 through NOISE-10 established by CEC Final Decision (00-AFC-14). These COCs are provided below. A minor change is noted in strikeout in NOISE-6 given the required preconstruction noise monitoring requirement was satisfied in 2003.

NOISE-1 Property Owner Notification: At least 15 days prior to site mobilization, the project owner shall notify all residents, property owners, and business owners within one-half mile of the site, and the City of Manhattan Beach, the City of El Segundo, and L.A. County Lifeguard Headquarters, by mail and/or other effective means, of the commencement of project construction. At the same time, the project owner shall establish and disseminate a 24-hour "hotline" telephone number for use by the public to report any undesirable noise conditions associated with the construction of the project. This telephone number shall also be posted at the project site during construction in a manner visible to passersby. This telephone number shall be maintained until the project has been operational for at least one year. The telephone shall be located in an area that is likely to be staffed, and, if the telephone is not staffed 24 hours per day, the project owner shall include an automatic answering feature, with date and time stamp recording, to answer calls when the phone is unattended.

Verification: The project owner shall transmit to the CPM in the first Monthly Construction Report following site mobilization, a statement, signed by the project manager, attesting that the above notification has been performed, and describing the method of that notification. This statement shall also attest that the telephone number has been established and posted at the site.

NOISE-2 Documentation of Noise Complaints: Throughout the construction and operation of the project, the project owner shall document, investigate, evaluate, and attempt to resolve all project-related noise complaints as soon as possible.

- The project owner shall establish and disseminate a 24-hour "hotline" telephone number for use by the public to report any undesirable noise conditions associated with the project. The telephone shall be located in an area that is likely to be staffed, and, if the telephone is not staffed 24 hours per day, the project owner shall include an automatic answering feature, with date and time stamp recording, to answer calls when the phone is unattended.
- The project owner shall designate a noise monitoring officer for each construction shift, and for the daytime shift after the plant is placed into service. The noise monitoring officer shall be trained in the use of a sound level meter, and shall be empowered to halt any construction activities causing or likely to cause a violation of the COCs herein. The noise monitoring officer shall carry at all times an operable portable electronic device (such as telephone or pager) to receive any incoming "hotline" call.
- The noise monitoring officer shall log each noise complaint on a CPM-approved complaint form and shall attempt to resolve the complaint.
- For construction noise complaints received outside of the construction hours and days allowed as described by COC NOISE-8, the noise monitoring officer shall take immediate steps to determine whether power plant construction is causing the noise and, if so, to reduce the noise level of that activity or take other appropriate action to remedy the complaint as quickly as possible (not to exceed one hour) in order to comply with the COCs.
- For construction noise complaints, the noise monitoring officer shall contact the complainant within the hour, if requested by the complainant, with information on the status and resolution of the complaint.
- In the event of construction noise complaints for two consecutive periods outside of which construction is specifically allowed by NOISE-8, either from a single affected residence, from multiple residences, or businesses, the project owner shall monitor noise levels at the receptor(s) for no less than the following two consecutive periods.
- The noise monitoring officer, as appropriate, shall measure site fence-line noise levels, and/or measure noise levels at the complainant's property line, to assure compliance.

- The project owner shall attempt to contact the person(s) making a plant operations noise complaint within 24 hours, and shall conduct an investigation to determine the source of noise related to the complaint.
- If the noise is related to plant operations, the project owner shall take all feasible measures to reduce the noise at its source as soon as possible.
- If the noise complaint is not resolved to the satisfaction of the complainant, including the time frame for resolution, the noise monitoring officer shall provide the Commission's toll free compliance telephone number (1-800-858-0784 unless otherwise specified by the CPM).
- Within 24 hours of receiving a noise complaint, the project owner shall file a copy of the Noise Complaint Resolution Form, or similar instrument approved by the CPM, with the City of El Segundo and City of Manhattan Beach, and with the CPM, documenting the complaint. If mitigation is required to resolve a complaint, and the complaint is not resolved within a 3-day period, the project owner shall submit a progress report and a proposed mitigation schedule, subject to the approval of the CPM, to the CPM and the affected City within 5 days of receiving the complaint.
- Following resolution of the noise complaint, the project owner shall submit an updated Noise Complaint Resolution Form and a report to the CPM and the affected City documenting the complaint and the actions taken. The report shall include: a complaint summary, including final results of noise reduction efforts; and if obtainable, a signed statement by the complainant stating that the noise problem is resolved to the complainant's satisfaction.

Verification: The project owner shall provide to the CPM, in the applicable Monthly and/or Annual Compliance Report, a listing of noise complaints received in that time period, and the status of resolution of each complaint, including all those which have not yet been resolved.

NOISE-3 Noise Control Program: Prior to site mobilization, the project owner shall submit to the CPM for review and approval a noise control program. The noise control program shall be used to reduce employee exposure to high noise levels during construction and also to comply with applicable OSHA and Cal-OSHA standards.

Verification: At least 30 days prior to site mobilization, the project owner shall submit to the CPM the above referenced program for review and approval. The project owner shall make the program available to OSHA upon request.

NOISE-4 Use of Low-Pressure Steam Blows: A low-pressure continuous steam blow or other equivalent low-pressure process shall be employed. Prior to site mobilization, the project owner shall submit a description of this process, with expected noise levels and projected hours of execution, to the CPM, who shall review the proposal with the objective of ensuring that the resulting noise level does not exceed the nighttime ambient hourly L50 value determined in NOISE-6 plus 5 decibels at the nearest residential property line. Project owner shall strive to avoid nighttime steam blows. If nighttime low pressure steam blows are unavoidable, these low pressure steam blows shall not exceed nighttime ambient hourly L50 value determined in NOISE-6 plus 2 decibels at the nearest residential property line during the hours 6:00 p.m. to 7:30 a.m. Copies of the process description and predicted noise levels shall be provided to the Cities of Manhattan Beach and El Segundo.

Verification: At least 15 days prior to any low-pressure continuous steam blow, the project owner shall submit to the CPM drawings or other information describing the steam blow process, including the noise levels expected and the projected time schedule for execution of the process.

NOISE-5 Steam Blow Notification: At least 15 days prior to the first steam blow(s), the project owner shall notify the Cities of El Segundo and Manhattan Beach, L.A. County Lifeguard Headquarters, and all residents, property owners and business owners within one mile of the site of the planned steam blow activity, and shall make the notification available to other area residents in an appropriate manner. The notification may be in the form of letters to the area residences, telephone calls, fliers and/or other effective means. The notification shall include a description of the purpose and nature of the steam blow(s), the proposed schedule, the expected noise levels and potential hazards associated with them, the "hotline" phone number where people register complaints, and the explanation that it is a one-time operation and not a part of normal plant operations.

Verification: Within 5 days of notifying these entities, the project owner shall send a letter to the CPM confirming that there has been appropriate notification to the residents, property owners, Cities and businesses of the planned steam blow activities, including a description of the method(s) of that notification.

NOISE-6 Compliance with Noise Standards: The project design and implementation shall include appropriate noise mitigation measures adequate to ensure that the project will not cause resultant noise levels to exceed the ambient median noise level (L50) at residential receivers by 2 decibels or more, and that the noise due to plant operations will otherwise comply with the noise standards of the El Segundo and Manhattan Beach Municipal Codes. No new pure tone components may be introduced. No single piece of equipment shall be allowed to stand out as a source of noise. Steam relief valves shall be adequately muffled.

A. Determine the ambient noise level (L50) at Residential Receivers. Prior to site mobilization, the project owner shall prepare and submit to the City of El Segundo and City of Manhattan Beach for review and comment, and to the CPM for review and approval, a Pre-Construction Noise Survey Plan. This plan will indicate the survey procedure and methodology for establishing the ambient noise level at nearby residential receivers. At a minimum, the plan will include the following:

- The project owner will conduct a 30-day continuous community noise survey at a residential receptor (on 45th Street in Manhattan Beach), selected by the CPM in cooperation with the City of Manhattan Beach. This pre-construction survey shall be conducted during the period of June 1 to September 30. Hourly Leq, L50 and L90 values shall be measured.
- Existing ESGS Units 3 and 4 shall be operating normally during the course of the survey, and the levels of plant operation will be documented during the survey. The plan will establish a range of acceptable ("normal") operating conditions suitable for the purposes of these studies.
- A simultaneous control measurement will be conducted within the project boundary. The site shall be selected to ensure that the dominant noise source will be the surf, requiring a clear line of sight to the surf. A location near the southwest project site corner is preferred to minimize the potential for noise from the existing power plant to influence the surf noise measurements. Wave height and other surf conditions, and any unusual environmental conditions occurring during the survey period shall be documented.
- For each of the days of noise data collected at each receptor, the arithmetic average median noise level (L50) shall be computed for the quietest consecutive 4-hour period. The resultant average median noise levels shall then be averaged arithmetically to calculate the relationship between surf noise levels and ambient noise levels along the northern side of the El Porto Community.
- If the initial 30-day measurement data, in the judgment of the CPM in consultation with the City of Manhattan Beach, fail to demonstrate a consistent relationship of surf and ambient noise levels, the measurement will be repeated until a consistent relationship can be established.

  Following approval of the Survey Plan, and prior to site mobilization, the project owner shall implement the survey and present the results in a Pre-Construction Noise Survey Report to the Cities of El Segundo and Manhattan Beach and to the CPM. The Report will include a discussion of the ambient noise level taking into consideration all relevant factors, such as plant operating conditions, surf and wind conditions.

B. Conduct post-construction survey. As soon as feasible, within the time frame described below and after Units 5, 6, ~~and~~ 7, 8, 9, 10, 11 and 12 first achieve a sustained output of 80 percent or greater of rated capacity, the project owner shall conduct short-term survey noise measurements at monitoring sites ST-1, ST-2, ST-3 and ST-12 (as described in the AFC, Section 5.12, Figure 5.12-3, as amended May 4, 2001). "In addition, the Applicant shall conduct a 30-day community noise survey at the same receptor locations used for the 30-day noise measurement cited in Section A above."

   The post-project community noise survey shall be conducted between June 1 and September 30, using the methods described in Item A. above. The post construction survey shall also include measurement of one-third octave band sound pressure levels at each of the above locations to ensure that no new pure tone noise components have been introduced. If environmental conditions prevent completion of the post-construction community noise survey in a timely manner, then the survey shall be completed as soon as conditions allow.

Following the post-construction survey, the project owner shall present the results in a Post-Construction Noise Survey Report to the Cities of El Segundo and Manhattan Beach and to the CPM. The Report will include a discussion of the relationships between surf and ambient noise levels.

C. Implement Tank Removal Noise Mitigation if Required. Mitigation measures shall be implemented to reduce noise levels to a level of compliance if the results from the post-construction noise survey at the residential receptor location indicate that the ambient median noise level (L50) has increased by 2 decibels or more due to facility operation, as determined by the relationship between surf and ambient noise levels obtained from the pre-construction survey. The project owner shall present the proposed mitigation measures to the Cities of El Segundo and Manhattan Beach and to the CPM.

D. Implement Pure Tone Mitigation if Required. If a facility-related pure tone is found to be present at any of the above monitoring sites, mitigation measures shall be implemented to eliminate the pure tone. For the purpose of this condition, the State of California's Model Community Noise Control Ordinance defines a pure tone. The project owner shall present the proposed mitigation measures to the Cities of El Segundo and Manhattan Beach and to the CPM.

E. Implement Plant Noise Mitigation if Required. If the results of noise measurements at ST-1, or ST-12 indicate that the ambient noise level has increased by more than 5 decibels due to facility operation, as compared with the baseline noise measurements conducted on July 20 and 21, 2000, the owner will implement mitigation measures to reduce the noise at those locations to comply with the Municipal Code of the City of El Segundo. The project owner shall present the proposed mitigation measures to the Cities of El Segundo and Manhattan Beach and to the CPM.

Verification:

The pre-construction survey was completed in 2003, in accordance with the following requirements:

Pre-Construction Survey and Determination of Ambient Noise Level.

a) At least 60 days prior to site mobilization, the project owner shall provide the Pre-Construction Noise Monitoring Survey Plan to the CPM for review and approval.

b) Within 30 days of completion of the survey, the project owner shall provide to the CPM for review and approval the results of the pre-construction noise survey.

Post-construction Survey. Within 45 days after completing the post-construction surveys, the project owner shall submit a summary report of the survey to the CPM. Included in the report will be a description of any additional mitigation measures necessary to achieve compliance with the above listed noise limits, and a schedule, subject to CPM approval, for implementing these measures.

Mitigation Implementation. If mitigation is required, then upon completion of installation of these measures, the project owner shall submit to the CPM a summary report of a new noise survey, performed as described in paragraph B and showing compliance with this condition.

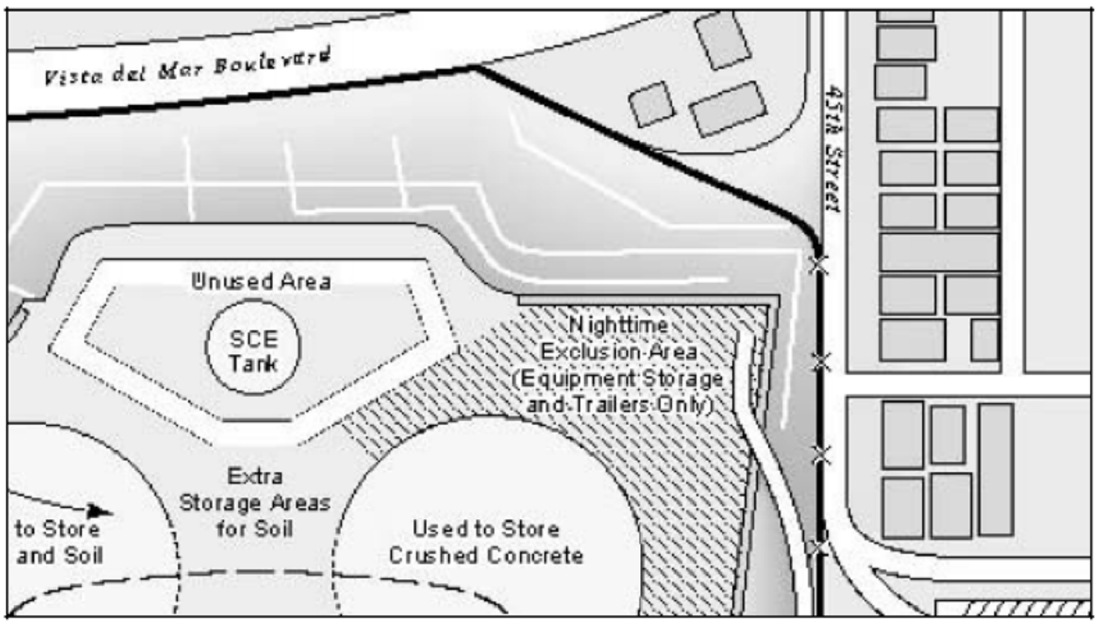
NOISE-7 Occupational Noise Survey: Within 30 days of the project first achieving a sustained output of 80 percent or greater of rated capacity, the project owner shall conduct an occupational noise survey to identify the noise hazardous areas in the facility. The survey shall be conducted by a qualified person in accordance with the provisions of Title 8, California Code of Regulations, sections 5095-5099 (Article 105) and Title 29, Code of Federal

Regulations, section 1910.95. The survey results shall be used to determine the magnitude of employee noise exposure. The project owner shall prepare a report of the survey results and, if necessary, identify proposed mitigation measures that will be employed to comply with the applicable California and federal regulations.

Verification: Within 30 days after completing the survey, the project owner shall submit the noise survey report, including proposed mitigation measures, to the CPM for review and approval. The project owner shall make the report available to OSHA and Cal-OSHA upon request.

NOISE-8 Construction/Demolition Schedule: Heavy equipment operation and noisy construction or demolition work shall be restricted beginning at site mobilization as described below. No pure tones are allowed outside of the hours of 7:30 A.M. to 6:00 P.M. Monday-Friday, and 9:00 A.M. to 6:00 P.M. Saturday. Haul trucks and other engine-powered equipment shall be equipped with adequate mufflers. Haul trucks shall be operated in accordance with posted speed limits. Truck engine exhaust brake use shall be limited to emergencies.

Tank Farm Area: Noise levels at any residential property line due to tank farm construction or demolition shall be limited to the average daytime hourly ambient L50 value plus 5 dBA, or 65 dBA L50, whichever is lower for continuous noise. For intermittent noise (up to 30 minutes in one hour) the maximum noise levels shall be ambient L50 plus 10 dBA). Haul trucks and other engine-powered equipment shall be equipped with adequate mufflers. Haul trucks shall be operated in accordance with posted speed limits. Truck engine exhaust brake use shall be limited to emergencies. The use of the tank farm area is divided into four phases. For each phase the following restrictions shall be observed. Construction activity outside the hours described will not be allowed in the area south of the southern tank, which shall be termed the nighttime exclusion area, shown below:



Other Areas of the Project Site: The noise standards for construction and demolition occurring at the rest of the project site (with the exception of the tank farm area) shall be:

- 65 dBA hourly L50 at any residential receptor during the hours of 7:30 A.M. to 6:00 P.M. Monday-Friday, and 9:00 A.M. to 6:00 P.M. Saturday.
- The ambient hourly L50 value plus 2 dBA at any residential receptor at any other time.

Ambient noise levels shall be determined from the pre-construction survey conducted pursuant to NOISE-6.

Verification: The project owner shall transmit to the CPM in the first Monthly Construction Report a statement acknowledging that the above restrictions will be observed throughout the construction of the project.

NOISE-9 Operational ~~Noise~~ Vibration Monitoring: The project design and implementation shall ensure that site mobilization, demolition, construction, or operation of the power plant will not cause vibration at any sensitive receptor to exceed a peak particle velocity of 0.003 in/sec, or to cause vibration which is perceptible without use of instruments to any reasonable person of normal sensitivity.

The noise monitoring officer designated pursuant to COC NOISE-1 shall log each construction vibration complaint on a CPM-approved complaint form and attempt to resolve the complaint. For construction vibration complaints received outside of the construction hours or days allowed as described by COC NOISE-8, the noise monitoring officer shall take immediate steps to determine whether power plant construction is causing the vibration and, if so, to reduce the vibration level of that activity as quickly as possible (not to exceed one hour) in order to comply with the COCs. The noise monitoring officer, as appropriate, shall measure site fence-line vibration levels to assure compliance. If the vibration complaint is not resolved to the satisfaction of the complainant, including a time frame for resolution, the noise monitoring officer shall provide the Commission’s toll free compliance telephone number (1-800-858-0784, unless otherwise specified by the CPM).

In the event of construction-related vibration complaints either from a single affected residence, from multiple residences, or businesses, the project owner shall monitor vibration at the receptor(s) for no less than the following two days of construction.

Within 24 hours of receiving a complaint for vibration, the project owner shall file a copy of the Noise Complaint Resolution Form, or similar instrument approved by the CPM, with the City of El Segundo and/or City of Manhattan Beach, and with the CPM.

If mitigation is required to resolve a complaint, and the complaint is not resolved within a 3-day period, the project owner shall submit a progress report and a proposed mitigation schedule, subject to the approval of the CPM, to the CPM and the affected City within 5 days of receiving the complaint. The project owner shall submit an updated Noise Complaint Resolution Form to the CPM and the affected City when the mitigation is finally implemented.

Verification: The project owner shall provide, in the applicable Monthly and/or Annual Compliance Report, a listing of vibration complaints received in that time period, and the status of resolution of each complaint, including all those which have not yet been resolved.

NOISE-10 Emergency Loudspeaker <u>Restrictions</u> ~~Testing~~: The loudspeaker system shall be used only for testing and emergencies.

Verification: The project owner shall transmit to the CPM in the first Monthly Construction Report a statement acknowledging that the above restrictions will be observed throughout the construction and operation of the project.

3.8 Public Health

As discussed in detail in Section 2.0, Project Description, this PTA proposes modifications to ESEC that necessitate evaluation of environmental impacts and potential amendments to existing COCs. The proposed amendment is for decommissioning, demolishing, and replacing existing Units 3 and 4 steam boiler plants with approximately 449 MW gross / 435 MW net of new natural-gas-fired electrical generating capacity, consisting of one combined-cycle train and two simple-cycle gas turbines. The air-cooled, combined-cycle train (CC Fast) will consist of a GTG (Unit 9), an HRSG, and one STG (Unit 10), rated at 325 MW net. The simple-cycle turbines (Units 11 and 12) will consist of two air-cooled Trent 60 ISE advanced aeroderivative gas turbines, each rated at 55 MW net / 58 MW gross. Removal of existing Units 3 and 4 will eliminate the remaining once-through ocean water cooling system at the ESEC. The ESPFM will improve electricity generation by adding fast start and dispatch flexibility to support southern California grid load balancing. Total site capacity (including the new equipment previously permitted and the ESPFM) will not exceed 1,020 MW net—the rated capacity of previously retired Units 1 and 2, plus the capacity of the soon-to-be-retired Units 3 and operating Unit 4, which will also be retired.

This section describes and evaluates potential effects the proposed changes may have on public health. Compliance with applicable LORS is also addressed.

As part of this evaluation, a screening health risk assessment has been performed in accordance with guidance established by OEHHA,[12] CARB,[13] and the SCAQMD.[14] The results of this risk assessment demonstrate that the potential impacts of the project will be below public health-related thresholds of significance. Beneficial aspects of the project regarding protection of public health include those listed below.

- Use of clean-burning natural gas fuel
- Low-sulfur content of the natural gas, which reduces sulfate fine particulate and SO_2 generation
- Highly efficient combustion gas turbine technology to minimize the amount of fuel and associated combustion emissions needed to produce electricity
- Water injection and SCR technology to control NOx emissions
- Oxidation catalyst technology to control CO emissions, and to reduce emissions of various TACs
- Optimized stack height to reduce ground-level concentrations of exhaust pollutants below public health-related significance thresholds

These project features will ensure that the public health impacts of the project will be minimized.

Impacts associated with the project’s emissions of criteria pollutants (i.e., pollutants for which federal or California AAQS have been promulgated) are described in Section 3.1, Air Quality. Potential public exposure to accidental releases of hazardous materials on the project site during operation is addressed in Section 3.5, Hazardous Materials Management. To ensure worker safety during operations and construction, safe work practices will be followed (see Section 3.14, Worker Safety and Fire Protection).

3.8.1 Affected Environment

3.8.1.1 ESEC Amendments

The proposed ESPFM will result in modifications to the ESEC license (00-AFC-14C). Decommissioning, demolishing, and removing existing Units 3 and 4 and replacing them with new Units 9, 10, 11, and 12 will not result in new

[12] OEHHA. Air Toxics Hot Spots Program Risk Assessment Guidelines, The Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments, April 2005.

[13] CARB. Consolidated Table of OEHHA/CARB-Approved Risk Assessment Health Values, February 2009, at http://www.arb.ca.gov/toxics/healthval/healthval.htm.

[14] SCAQMD, *Supplemental Guidelines for Preparing Risk Assessments for the Air toxics “Hot Spots” Information and Assessment Act (AB2588),* June 2011

public health impacts above those identified in the CEC's amended license for 00-AFC-14C and as described in Section 2.0.

The CEC defines sensitive receptors as infants and children, the elderly, the chronically ill, and any other members of the general population who are more susceptible to the effects of exposure to environmental contaminants than the population at large. For the purposes of this analysis, sensitive receptors are defined as the locations occupied by groups of individuals who may be more susceptible to health risks from a chemical exposure: schools (public and private), day-care facilities, convalescent/nursing homes, retirement homes, health clinics, and hospitals. Because sensitive individuals may be located at any residential site, risk-based standards apply to existing residences and places where residences may be built without a change in zoning as well as sensitive receptors. If project impacts are protective of sensitive individuals at the point of maximum impact, they are protective at all locations. Identification of sensitive receptors is typically done to ensure that notice of possible impacts is provided to the community.

The area surrounding to the north and east of the facility is heavily industrial; the ocean lies to the west. There are no sensitive receptors within the area impacted by the project. The closest residences are a group of residences to the south, located approximately 0.4 km from the project.

3.8.2 Environmental Consequences

This section describes the evaluation of potential public health risks due to construction and operation of the proposed project and the methodology and results of the HRA. A significant impact is defined as a maximum incremental cancer risk greater than 10 in 1 million, a chronic total hazard index (THI) greater than 1.0, or an acute THI greater than 1.0. Also, uncertainties in the HRA are discussed and other potential health impacts of the project are described.

3.8.2.1 Construction Impacts

Demolition of the old boilers and construction of the new equipment is expected to take approximately 20 months. No significant public health effects are expected during construction. Strict construction practices that incorporate safety and compliance with applicable LORS will be followed. In addition, mitigation measures to reduce air emissions from construction impacts will be implemented as described in Section 3.1.

Temporary air emissions from construction are presented in detail in Appendix 3.1D, followed by a criteria pollutant air dispersion analysis that demonstrates ambient air quality standards will not be exceeded by construction of the project. The principal toxic air contaminant during construction is diesel particulate matter (DPM) from combustion of diesel fuel in construction equipment (e.g., cranes, dozers, excavators, graders, front-end loaders, backhoes). DPM emissions from on-site construction are summarized in Table 3.8-1.

TABLE 3.8-1
Maximum Onsite Construction DPM Emissions

Emitting Activity	Pounds per Day	Tons per Year
Construction Equipment	13.4	1.5

Ambient air modeling for PM_{10}, $PM_{2.5}$, CO, SO_2 and NO_2 was performed as described in Section 3.1 and Appendix 3.1D. Construction-related emissions are temporary and localized, resulting in no long-term significant health impacts to the public.

Small quantities of hazardous waste may be generated during construction. Hazardous waste management plans will be in place so the potential for public exposure is minimal. (Refer to Section 3.13, Waste Management, for more information.) No acutely hazardous materials will be used or stored onsite during construction (see Section Section 3.5, Hazardous Materials Management). To ensure worker safety during construction, safe work practices will be followed (see Section 3.14, Worker Safety and Fire Protection).

3.8.2.2 Operations Impacts

Project emissions to the air will consist of combustion by-products from the natural gas-fired turbines. These pollutants include certain volatile organic compounds and polycyclic aromatic hydrocarbons (PAHs) from the combustion of natural gas, and ammonia from the SCR NOx control systems. These pollutants are listed in Table 3.1-20, and the detailed emission summaries and calculations are presented in Appendix 3.87A. After dispersion to ground level, inhalation is the main pathway by which air pollutants can potentially cause public health impacts. Other pathways—including ingestion of soil, fish, and drinking water, and dermal absorption—are also evaluated for potential exposure. As discussed below, these health risks are not significant.

3.8.2.3 Public Health Impact Assessment Approach

3.8.2.3.1 Significance Criteria

Cancer risk is the probability or chance of contracting cancer over a human life span (assumed to be 70 years). Carcinogens are assumed to have no threshold below which there would be no human health impact. In other words, any exposure to a carcinogen is assumed to have some probability of causing cancer; the lower the exposure, the lower the cancer risk (i.e., a linear, no-threshold model). Under state and SCAQMD regulations, an incremental cancer risk greater than 10-in-one million due to a project is considered to be a significant impact on public health if the emitting units are determined by the District to be using Toxics Best Available Control Technology (T-BACT). The 10-in-one-million risk level is also used by the Air Toxics "Hot Spots" (AB 2588) program and California's Proposition 65 as the public notification level for air toxic emissions from existing sources.

Non-cancer health effects can be either long-term (chronic) or short-term (acute). In determining potential non-cancer health risks from air toxics, it is assumed there is a dose of the TAC below which there would be no impact on human health. The air concentration corresponding to this dose is called the Reference Exposure Level (REL). A non-cancer health risk is measured in terms of a health hazard quotient, which is the calculated maximum exposure (concentration) of each TAC divided by its REL. Health hazard quotients for TACs affecting the same target organ are typically summed with the resulting totals expressed as health hazard indices for each organ system. A health hazard index of less than 1.0 is considered to be a less-than-significant health risk.

Chronic toxicity is defined as adverse health effects from prolonged chemical exposure, caused by chemicals accumulating in the body. Because chemical accumulation to toxic levels typically occurs slowly, symptoms of chronic effects usually do not appear until long after exposure commences. The lowest no-effect chronic exposure level for a noncarcinogenic air toxic is the chronic REL. Below this threshold, the body is capable of eliminating or detoxifying the chemical rapidly enough to prevent its accumulation. The chronic hazard index was calculated using the hazard quotients calculated with annual concentrations.

Acute toxicity is defined as adverse health effects caused by a brief chemical exposure of no more than 24 hours. For most chemicals, the air concentration required to produce acute effects is higher than the level required to produce chronic effects because the duration of exposure is shorter. Because acute toxicity is predominantly manifested in the upper respiratory system at threshold exposures, all acute health hazard quotients are typically summed to calculate the acute health hazard index. The maximum one-hour average concentration of each TAC with acute health effects is divided by the TAC's acute REL to obtain a health hazard index for health effects caused by relatively high, short-term exposure to air toxics. An additional conservative procedure in this health risk assessment is that the health hazard quotients for all TACs having potential acute impacts were summed regardless of target organ. This method leads to an upper bound assessment.

3.8.2.3.2 Methodology

District Rule 1401 requires a health risk assessment (HRA). The potential human health risks posed by the project's emissions were assessed using procedures consistent with the *Supplemental Guidelines for Preparing Risk Assessments for the Air toxics "Hot Spots" Information and Assessment Act (AB2588)* (SCAQMD, June 2011),[15]

[15] SCAQMD, *Supplemental Guidelines for Preparing Risk Assessments for the Air toxics "Hot Spots" Information and Assessment Act (AB2588),* June 2011

Office of Environmental Health Hazard Assessment (OEHHA) Air Toxics Hot Spots Program Risk Assessment Guidelines (Cal-EPA/OEHHA, 2003),[16] and guidance from SCAQMD staff. The SCAQMD and OEHHA guidelines were developed to provide risk assessment procedures, as required under the Air Toxics Hot Spots Information and Assessment Act of 1987, Assembly Bill 2588 (Health and Safety Code Sections 44360 et seq.). The Hot Spots law established a statewide program to inventory air toxics emissions from individual facilities, as well as guidance for execution of risk assessments and requirements for public notification of potential health risks.

Air dispersion modeling combined the project emissions with site-specific terrain and meteorological conditions to analyze short-term and long-term concentrations in the air for use in the health risk assessment. The EPA-recommended air dispersion model, AERMOD, was used along with three years (2007–2009) of compatible meteorological data from the LAX meteorological monitoring station assembled and provided by the staff of the SCAQMD. The meteorological data combined surface measurements made at LAX with upper air data from MCAS Miramar. Because HARP is built on a previous EPA-approved air dispersion model, Industrial Source Complex Short Term, Version 3 (ISCST3), the CARB HARP On-Ramp was used to integrate the air dispersion modeling output from the required air dispersion mode, AERMOD, with the risk calculations in the HARP risk module.[17]

The HRA modeling was prepared using CARB's Hotspots Analysis and Reporting Program (HARP) computer program (Version 1.4c, August 2010). The HARP model was used to assess cancer risk as well as non-cancer chronic and acute health hazards. The HRA includes the three following pathways: inhalation, dermal absorption, and soil ingestion.

Health risks were evaluated for a hypothetical Maximum Exposed Individual (MEI) located at the point of maximum impact (PMI). The cancer risk to the MEI at the PMI is referred to as the Maximum Incremental Cancer Risk, or MICR. Human health risks associated with emissions from the project are unlikely to be higher at any other location than the PMI. If there is no significant impact associated with concentrations in air at the PMI location, it is inferred that there would not be significant impacts in any other location. Health risks were also evaluated for a hypothetical Maximum Exposed Individual at an existing Residential receptor (MEIR), an individual assumed to be located at the existing residence where the highest concentrations of air pollutants associated with facility emissions are predicted to occur. 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 MEIR. Both the MICR and the MEIR are residential risks and are based on 24 hour per day, 365 day per year, 70-year lifetime exposure. Because this is a screening analysis, the MEIR is assessed at the PMI.

Health risks are also assessed for the hypothetical Maximum Exposed Individual at an existing Worker receptor, or MEIW. This assessment reflects potential workplace risks, which are lower than residential risks because of lower exposure. Workplace risks reflect 8 hour per day, 245 day per year, 40-year exposure. Because this is a screening analysis, the MEIW risk is assessed at the PMI (the most conservative assumption).

The inhalation cancer potency factors and RELs used to characterize health risks associated with modeled concentrations in air are taken from the *Consolidated Table of OEHHA/CARB Approved Risk Assessment Health Values* (CARB, October 18, 2010) and are presented in Table 3.8-2.

[16] Office of Environmental Health Hazard Analysis, *Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments*, August 2003.

[17] HARP On-Ramp Version 1, accessed at http://www.arb.ca.gov/toxics/harp/downloads.htm.

TABLE 3.8-2
HARP Modeling Results – Maximum Impacts

Risk Parameter[a]	Residential[b]	Commercial	Rule 1401 Requirements	Compliance (Yes/No)
New Units (Units 9, 11 and 12 and Auxiliary Boiler)				
MICR	0.17×10^{-6}	0.03×10^{-6}	$\leq 1 \times 10^{-6}$	Yes
HIA (Case 1)[c]	5.1×10^{-3}	—	≤ 1.0	Yes
HIA (Case 2)[c]	4.7×10^{-3}	—	≤ 1.0	Yes
HIC	2.9×10^{-3}	—	≤ 1.0	Yes
Units 5 and 7				
MICR	0.13×10^{-6}	0.02×10^{-6}	$\leq 1 \times 10^{-6}$	Yes
HIA (Case 1)[c]	5.1×10^{-3}	—	≤ 1.0	Yes
HIA (Case 2)[c]	5.1×10^{-3}	—	≤ 1.0	Yes
HIC	3.1×10^{-3}	—	≤ 1.0	Yes
Facilitywide Impacts (Units 5, 7, 9, 11 and 12 and Auxiliary Boiler)				
MICR	0.25×10^{-6}	0.05×10^{-6}	≤ 1 x 10-	Yes
HIA (Case 1)[c]	1.0×10^{-2}	—	≤ 1.0	Yes
HIA (Case 2)[c]	0.8×10^{-2}	—	≤ 1.0	Yes
HIC	5.7×10^{-3}	—	≤ 1.0	Yes

[a] MICR: Maximum individual cancer risk; HIA: acute hazard index; HIC: chronic hazard index.

[b] Residential impacts for MICR; maximum impact for other health risks.

[c] Acute impact modeling scenarios: Case 1: All gas turbines in operation, auxiliary boiler not operating; Case 2: Units 11 and 12 and auxiliary boiler operating, Unit 9 not operating.

3.8.3 Cumulative Impacts

Cumulative impacts from the existing sources at the facility (Units 5 and 7) as well as the new sources associated with the project were evaluated, and are presented in Table 3.8-2. All facility impacts are below District significance thresholds.

3.8.4 Conclusions and Recommendations

The project will meet all requirements of the District's risk management rule, and will not result in a significant public health impact.

3.8.5 References

California Air Resources Board. 2010. Consolidated table of OEHHA/ARB approved risk assessment health values. (http://arbis.arb.ca.gov/toxics/healthval/contable.pdf). October 18.

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3.9 Socioeconomics

This section describes and evaluates potential effects the proposed ESPFM may have on socioeconomic conditions since the CEC Final Decision in 2005 and the subsequent PTAs. Compliance with applicable LORS is also addressed.

3.9.1 Amendment Overview

As discussed in detail in Section 2.0, Project Description, this PTA proposes modifications to the ESEC that necessitate evaluation of environmental impacts and potential amendments to existing COCs. The proposed PTA is for decommissioning, demolishing, and replacing the existing Units 3 and 4 steam boiler plants with approximately 449 MW gross / 435 MW net of new natural-gas-fired electrical generating capacity, consisting of one combined-cycle train and two simple-cycle gas turbines. The air-cooled, combined-cycle train (CC Fast) will consist of a GTG (Unit 9), a an HRSG, and one STG (Unit 10), rated at 325 MW net. The simple cycle turbines (Units 11 and 12) will consist of two air-cooled Trent 60 ISE advanced aeroderivative gas turbines, each rated at 55 MW net / 58 MW gross. The GE turbine will be supported by a small (36 MMBtu/hr) auxiliary boiler that will be incorporated into the operation of the CC Fast. Removal of existing Units 3 and 4 will eliminate the remaining once-through ocean water cooling system at the ESGS site. The ESPFM will improve electricity generation by adding fast-start and dispatch flexibility capability to support southern California grid load balancing. Total site capacity (including the new equipment previously permitted) will not exceed 1,020 MW net—the rated capacity of previously retired Units 1 and 2, plus the capacity of the soon-to-be-retired Unit 3 and operating Unit 4, which will also be retired as part of the ESPFM.

3.9.2 Affected Environment

3.9.2.1 ESEC Amendments

The proposed ESPFM will result in modifications to the ESEC license (00-AFC-14C). Decommissioning, demolishing, and removing existing Units 3 and 4 and replacing them with new Units 9, 10, 11, and 12 will not result in new socioeconomic impacts above those identified in the CEC's amended license for 00-AFC-14C and as described in Section 2.0.

The ESPFM socioeconomic study area is bounded by the Pacific Ocean to the west, Interstate 105 to the north, Aviation Boulevard to the east, and Rosecrans Avenue to the south. No major changes to the socioeconomic conditions have occurred since preparation of 00-AFC-14 and the subsequent PTAs.

The following is a brief description of the areas covered by each existing COC:

- **SOCIO-1:** City of El Segundo Development Mitigation Fees
- **SOCIO-2:** Fiscal Impact Analysis

ESEC LLC has implemented reporting requirements to document socioeconomic requirements identified in the existing COCs. As such, the project owner will continue to comply with the requirements set forth in these COCs and will provide updates regarding the demolition and construction-related socioeconomic reporting requirements, as necessary.

3.9.3 Environmental Analysis

The capital cost for the ESEC pursuant to the 2005 CEC license for 00-AFC-14 and subsequent amendments was estimated to be approximately $350 to $400 million. The addition of the proposed ESPFM to the capital cost of the project is expected to be approximately $420 to $500 million, which is 20% to 25% higher than the cost for ESEC due to increases in labor and the material costs since the filing of 00-AFC-14. However, the cost increases are consistent with project cost escalations throughout the United States. Demolishing Units 3 and 4 and eliminating once-through cooling through the implementation of dry cooling technology associated with the implementation of Units 9, 10, 11, and 12 ensures long-term regulatory feasibility and economic viability for the ESEC project.

Overall, implementation of the ESEC, including the additional of ESPFM, will have a de minimus impact on employment, housing, or schools, as the required construction labor force for ESPFM will be reduced by approximately 12% from that for ESEC, and projected permanent employee numbers remain unchanged from estimates provided in 00-AFC-14. In addition, utilities and public services will not be significantly impacted by the proposed addition of ESPFM to the ESEC project.

Environmental justice impacts are also not expected because the proposed addition of ESPFM to the ESEC project does not result in any significant unmitigated adverse environmental or public health impacts above what was analyzed as part of the 00-AFC-14 proceedings. Any potential air quality, public health, and hazardous materials handling impacts to the public will continue to be mitigated to less than significant levels through the existing and proposed modifications to COCs (modifications proposed for Air Quality and Public Health COCs).

3.9.3.1 Project Capital Costs and Tax Revenue

The capital cost estimate for ESEC included in 00-AFC-14 was approximately $350 to $400 million, in 2000 dollars. The capital cost of the addition of ESPFM to the ESEC is approximately 20 to 25% higher ($420 to $500M) due to increases in labor and the cost of materials since the original AFC was filed in 2000. These cost increases are consistent with power plant demolition and construction project cost escalations throughout the United States.

In the Final Decision (00-AFC-14), it was estimated that the project would result in a net property value improvement of $250 million. The improvement value of the proposed addition of ESPFM to the ESEC project is comparable, but will need to be adjusted to reflect 2013 dollars. Overall, the proposed ESPFM addition of highly efficient fast start and dispatch flexibility combined-cycle generation technology to the ESEC project presents an economic benefit as compared to the continued operation of Units 3 and 4. The sustained improvement value of the proposed addition of ESPFM to the ESEC project is intrinsically related to the overall long-term financial viability of the ESEC project and it amendments. Financial viability and improvement value of the ESEC project will be strengthened when regulatory risks, such as once-through cooling for Units 3 and 4, are eliminated and replaced with an air-cooled design. Consistent with the COCs for 00-AFC-14, the City of El Segundo, Los Angeles County, and the El Segundo Unified School District will receive increased tax revenues based on the improved and reassessed property value. In addition, franchise fees to the City of El Segundo for natural gas for ESPFM will be based upon comparable capital improvements as those assessed for the demolition of Units 1 and 2 and the implementation of Units 5 through 8, based on similar projected volumes of gas usage, when considered on the unit of energy produced for ESPFM.

3.9.3.2 Construction and Operations

The conversion to the fast start combined-cycle generation technology and advanced peaking generation will reduce the volume of local labor required for construction of ESPFM as compared to the previous ESEC peak of 422 construction workers, over 20 months, with an estimated total labor requirement of 4,995 man-months. The proposed addition of ESPFM to the ESEC project will have a peak of 337 construction workers over an 18-month period, with, an estimated total construction labor requirement of 4,364 man-months. The ESPFM net reduction in construction labor as compared to ESEC is 631 man-months, representing a 12% labor reduction as compared to the ESEC. The reduction in labor is primarily related to delivery of pre-assembled primary components associated with the CC Fast and Trent units.

The construction payroll of the ESEC project was estimated to be between $60 and $65 million. This estimated range was developed in calendar year 2000 and labor needs were projected for the period between calendar years 2002 and 2003. Based on a nominal rate of escalation of 3.5% per annum the original construction payroll range for ESEC would equate to approximately $74 to $80 million. The estimated construction payroll of the proposed addition of ESPFM to the ESEC project is between $94 and $98 million in escalated to 2015 through 2018 at an increase of 3.5% per year. The ESPFM will have similar temporary benefits as the ESEC project (00-AFC-14), providing the City of El Segundo and adjacent areas with an increase in local jobs and commercial activity during the construction.

The 00-AFC-14 proceedings disclosed operation payroll originally estimated at approximately $1.6 million per year using the projected first year of operation in 2004. Adjusting for inflation, the actual expected operational cost as was disclosed during the 00-AFC-14 proceedings is $2.2 million using an anticipated first full year of operation in 2013. For the addition of ESPFM to the project, the anticipated first full year of operation of ESEC’s Units 9, 10, 11 and 12 is now projected to be 2018. Adjusting for inflation the estimated payroll is projected to be approximately $2.5 million per year.

3.9.3.3 Utilities and Public Services

The addition of the ESPFM to the ESEC project will not increase demands on utilities or public services associated with the change in technology as compared to the impacts identified as part of 00-AFC-14 proceedings. The proposed ESPRM fast start and dispatch flexibility combined-cycle generation technology will require increased deliveries of reclaimed water from West Basin Municipal Water District as compared to the ESEC project, but West Basin has stated it will be able to provide the project with sufficient supplies. It is also expected that potable water supply from the City of El Segundo and sanitary sewer service by City of Manhattan Beach will remain unchanged from the requirements evaluated in 00-AFC-14. The addition of ESPFM to the ESEC project will not increase impacts on fire or police protection or hospital services, as the scale of project construction and operation is similar, or slightly decreased, as is the case for labor needs and construction phase duration. The addition of ESPFM to the ESEC project will have a de minimus impact on employment, housing, or schools, as the required construction labor force for the addition of ESPFM will be a reduction of approximately 12% of the construction labor for the ESEC project, and projected permanent employee numbers for the ESEC project remain unchanged with the addition of ESFM from estimates evaluated in 00-AFC-14.

3.9.3.4 Offsite Construction Laydown and Construction Worker Parking Areas

The preferred offsite laydown area, located at 777 W. 190th Street in the City of Gardena, was incorporated into ESEC in the 2010 PTA decision and will continue to be used for ESPFM. Construction laydown and parking areas will also be established within the ESGS site boundary, as well as at offsite areas identified in the CEC Final Decision and shown on Figure 2-10. The 190th Street area is less than ten miles southeast of the ESGS and is easily accessible to the I-405 and I-110 North freeways from Vermont Avenue and 190th Street as well as to ESEC-approved traffic/truck routes. This site, zoned M2, commercial, has approximately ten usable acres and includes a 5,500 square-foot industrial building. The approximately 12.1-acre site paved with asphalt has nightlighting and includes a perimeter security fence. No site preparation other than minor clean-up is required prior to use. The existing COCs ensure that construction-related socioeconomic impacts associated with offsite storage and parking complies with socioeconomic requirements.

3.9.4 Cumulative Impacts

The proposed ESEC project changes will not result in any significant cumulative socioeconomic impacts beyond those addressed in the CEC Final Decision.

3.9.5 Laws, Ordinances, Regulations, and Standards

The CEC Final Decision (00-AFC-14) found the project to be in compliance with all applicable LORS. As described in this PTA, the proposed addition of ESPFM to the ESEC project is consistent with applicable socioeconomic-related LORS and will not alter the assumptions or conclusions made in the CEC Final Decision and therefore, no additional or revised LORS compliance have been identified.

3.9.6 Conditions of Certification

The socioeconomic requirements subject to approved COCs SOCIO-1 and SOCIO-2 are adequate to address any new potential impacts from the addition ESPFM to the ESEC project. The analysis concludes that no modifications to the COCs set forth in the previously permitted project (00-AFC-14) are necessary and no new COCs are required. These COCs are provided below.

SOCIO-1 City of El Segundo Development Mitigation Fees: Prior to the start of commercial operations of new generating units ~~the ESEC project~~, the project owner shall pay the City of El Segundo the following one-time fees (the following fees are based on the fees established by the City of El Segundo for the ESEC project; the fees established by the City of El Segundo for the addition of ESPFM will be confirmed with the City of El Segundo by the CEC CPM):

- Police service mitigation fee of $0.11 per gross square foot of building area;
- Fire service mitigation fee of $0.14 per gross square foot of building area;
- Library service mitigation fee of $0.03 per gross square foot of building area;
- Traffic mitigation fee for new development, in an amount to be determined by the City of El Segundo Public Works Director upon receipt of a Traffic Mitigation Fee Determination Form.

The gross square foot of building area and the amount of the one-time fees shall be determined by the City of El Segundo at the time the project owner submits the site plans.

Verification: Prior to the start of commercial operation, the project owner shall submit verification to the CPM that payment of any required public service mitigation fees have been submitted to the City of El Segundo. The project owner shall provide proof of payment of the Traffic Mitigation Fee in the next Monthly Compliance Report following payment.

SOCIO-2 Fiscal Impact Analysis: Prior to any ground disturbance activities, the project owner shall prepare a fiscal impact analysis for the project that includes analysis of the actual revenues and costs associated with the project. The revenue analysis shall include an analysis of the total property tax, franchise tax, utility user tax, sales and use tax, business license fees, building permit fees, and other revenues generated by the facility as identified in the City of El Segundo's Fiscal Impact Model. The cost analysis shall include a discussion of the cost to City services (i.e., police, fire, public works) for ongoing service to the project. The fiscal impact analysis shall compare the revenue and costs over a minimum period of five years following the start of commercial operations.

Verification: At least 30 days prior to any ground disturbance activities, the project owner shall transmit the analysis to the City of El Segundo for review and comment and to the Energy Commission Compliance Project Manager (CPM) for review and approval.

3.10 Soil and Water Resources

This section describes and evaluates potential effects the proposed ESPFM may have on soil and water resources since the CEC Final Decision in 2005 and the subsequent PTAs. Compliance with applicable LORS is also addressed.

3.10.1 Amendment Overview

As discussed in detail in Section 2.0, Project Description, this PTA proposes modifications to the ESEC that necessitate evaluation of environmental impacts and potential amendments to existing COCs. The proposed PTA is for decommissioning, demolishing, and replacing the existing Units 3 and 4 steam boiler plants with approximately 449 MW gross / 435 MW net of new natural-gas-fired electrical generating capacity, consisting of one combined-cycle train and two simple-cycle gas turbines. The air-cooled, combined-cycle train (CC Fast) will consist of a GTG (Unit 9), a an HRSG, and one STG (Unit 10), rated at 325 MW net. The simple cycle turbines (Units 11 and 12) will consist of two air-cooled Trent 60 ISE advanced aeroderivative gas turbines, each rated at 55 MW net / 58 MW gross. The GE turbine will be supported by a small (36 MMBtu/hr) auxiliary boiler that will be incorporated into the operation of the CC Fast. Removal of existing Units 3 and 4 will eliminate the remaining once-through ocean water cooling system at the ESGS site. The ESPFM will improve electricity generation by adding fast-start and dispatch flexibility capability to support southern California grid load balancing. Total site capacity (including the new equipment previously permitted) will not exceed 1,020 MW net—the rated capacity of previously retired Units 1 and 2, plus the capacity of the soon-to-be-retired Unit 3 and operating Unit 4, which will also be retired as part of the ESPFM.

3.10.2 Affected Environment

3.10.2.1 ESEC Amendments

The proposed ESPFM will result in modifications to the ESEC license (00-AFC-14C). Decommissioning, demolishing, and removing existing Units 3 and 4 and replacing them with new Units 9, 10, 11, and 12 will not result in new soil and water resource impacts beyond those identified in the CEC's amended license for 00-AFC-14 and as described in Section 2.0. It is anticipated that demolition of Units 3 and 4 and construction of Units 9, 10, 11, and 12 will require grading and excavation activities similar to the demolition of Units 1 and 2 and foundation and underground infrastructure completed during construction of Units 5 through 8 and their supporting equipment and structures. For the most part, subsurface activities are expected to occur in areas of the ESGS site that have been previously disturbed as part of historical power plant operations at the site, including the most current subsurface activities required for the demolition of Units 1 and 2 and construction of Units 5 through 8. The resource protection measures included in existing COCs WATER QUALITY-7 through WATER QUALITY-10 and WATER RES-3 through WATER RES-5 are adequate to address potential impacts to soil and water. The following is a brief description of the soil and water resources existing COCs:

- **WATER QUALITY-7** NPDES Permit for Storm Water Discharges During Construction
- **WATER QUALITY-8** Drainage, Erosion, and Sediment Control Plan (DESC)
- **WATER QUALITY-9** NPDES Permit for Storm Water Discharges During Operation
- **WATER QUALITY-10** Ballast Water Management Plan
- **WATER RES-3** Recycled Water Purchase Agreement
- **WATER RES-4** Potable Water Supply Agreement
- **WATER RES-5** Potable Water Meter Installation and Water Use Summary Report

El Segundo Energy Center LLC (ESEC LLC), the project owner, a wholly owned subsidiary of NRG Energy, Inc. will continue to comply with the requirements set forth in these COCs.

3.10.3 Environmental Analysis

As discussed in Section 2.0, Project Description, the demolition and removal of Units 3 and 4 and the installation and operation of new Units 9, 10, 11, and 12 will result in similar grading, excavation, foundation, and underground infrastructure activities as was required for the demolition of Units 1 and 2 and the construction of

Units 5 through 8. Further, because for the most part, subsurface activities required for construction of Units 9, 10, 11, and 12 are expected to occur in areas of the ESGS site that have been previously disturbed as part of historical power plant operations at the site, including the most current subsurface activities required for the demolition of Units 1 and 2 and construction of Units 5 through 8, no impacts beyond those described in 00-AFC-14 are anticipated. Therefore, the resource protection measures included in existing COCs WATER QUALITY-7 through WATER QUALITY-10 and WATER RES-3 through WATER RES-5 are adequate to address potential impacts to soil and water resources from the addition of the ESPFM to the ESEC, and demolition and construction activities for Units 9, 10, 11, and 12 will be conducted in accordance with these COCs and all applicable LORS.

3.10.3.1 Offsite Construction Laydown and Construction Worker Parking Areas

The preferred offsite laydown area, located at 777 W. 190th Street in the City of Gardena, was incorporated into ESEC in the 2010 PTA decision and will continue to be used for ESPFM. Construction laydown and parking areas will also be established within the ESGS site boundary, as well as at offsite areas identified in the CEC Final Decision and shown on Figure 2-10. The 190th Street area is less than ten miles southeast of the ESGS and is easily accessible to the I-405 and I-110 North freeways from Vermont Avenue and 190th Street as well as to ESEC-approved traffic/truck routes. This site, zoned M2, commercial, has approximately ten usable acres and includes a 5,500 square-foot industrial building. The approximately 12.1-acre site paved with asphalt has nightlighting and includes a perimeter security fence. No site preparation other than minor clean-up is required prior to use. Since subsurface ground disturbance is not required and no soil and water resource impacts will result from using offsite construction laydown and parking areas, the existing COCs ensure that construction-related impacts associated with offsite storage and parking complies with soil and water resource protection plans.

3.10.4 Cumulative Impacts

The proposed ESPFM covered under this PTA will result in similar subsurface activities as was required for the previous demolition of Units 1 and 2 and construction of Units 5 through 8 and their supporting equipment and structures. ESPFM subsurface demolition and construction activities are expected to occur in areas of the ESGS site that have been previously disturbed as part of historical power plant operations at the site and impacts beyond those described in 00-AFC-14 (and the previous PTAs) are not anticipated. The resource protection measures included in existing COCs WATER QUALITY-7 through WATER QUALITY-10 and WATER RES-3 through WATER RES-5 are adequate to address potential impacts from the addition of ESPFM to ESEC to soil and water resources; therefore, the addition of ESPFM to ESEC will not result in any significant cumulative impacts beyond those addressed in the CEC Final Decision for 00-AFC-14.

3.10.5 Laws, Ordinances, Regulations and Standards

The CEC Final Decision found the project to be in compliance with applicable soil and water resource LORS. As described in this PTA, the proposed addition of ESPFM is consistent with applicable soil and water resource-related LORS and the Amendment will not alter the assumptions or conclusions in the CEC Final Decision and no additional or revised LORS compliance requirements have been identified.

3.10.6 Conditions of Certification

Existing COCs WATER QUALITY-7 through WATER QUALITY-9 and WATER RES-3 through WATER RES-5 are adequate to address the addition of ESPFM to ESEC without being amended, with the exception of the minor changes below that focus on the ESEC beach delivery of components, which was not implemented for ESEC, and which is not being considered as part of this PTA for the addition of ESPFM. These COCs are provided below.

WATER QUALITY-7 NPDES Permit for Storm Water Discharges During Construction: The project owner shall comply with the requirements of the State Water Resources Control Board's (SWRCB) National Pollutant Discharge Elimination System (NPDES) Permit for Storm Water Discharges Associated with Construction Activity (Water Quality Order 99-08-DWQ <u>and any other subsequent orders</u>). The project owner shall develop and implement a Storm Water Pollution Prevention Plan (Construction SWPPP) for the construction of the ESPRP site, laydown areas including El Segundo Beach, and all linear facilities. The Construction SWPPP shall be reviewed and approved by the City of El Segundo (City) and shall be in compliance with the City's Standard Urban Stormwater

Mitigation Plan (SUSMP) per the requirements of the Los Angeles Regional Water Quality Control Board (LARWQCB) NPDES Permit No. CAS0004001 and the City's Ordinance No. 1348 and Chapter 7 of Title 5 of the municipal code.

Verification: Prior to site mobilization, demolition, and/or construction related ground disturbing activities, including those activities associated with the beach delivery and linear facilities, the project owner shall submit to the CPM a copy of the Construction SWPPP that includes the requirements of the City's SUSMP and retain a copy on-site. The project owner shall submit copies to the CPM of all correspondence between the project owner and the City, the LARWQCB, and the SWRCB regarding the City's SUSMP and the Construction SWPPP within 10 days of its receipt or submittal. This information shall include copies of the Notice of Intent and Notice of Termination for the project.

WATER QUALITY-8 Drainage, Erosion, and Sediment Control Plan (DESCP): Prior to soil disturbing activities, the project owner shall obtain CPM approval for a site-specific Drainage, Erosion, and Sediment Control Plan (DESCP) that addresses all project elements ~~including those activities related to delivery of equipment from the beach~~. The DESCP shall be revised to address specific soil disturbing and soil stabilizing activities associated with pre-construction, construction, and post-construction activities. ~~of the ESPRP.~~

The DESCP shall be consistent with the grading and drainage plan as required by condition of certification CIVIL-1 and may incorporate by reference any Storm Water Pollution Prevention Plan (SWPPP) developed in conjunction with state or municipal NPDES permits. The DESCP shall contain elements A through I below:

A. Vicinity Map - Map(s) at a minimum scale 1 "=100' shall be provided indicating the location of all project elements with depictions of all significant geographic features including swales, storm drains, and sensitive areas.

B. Site Delineation - All areas subject to soil disturbance for the ESPRP (project site, lay down area, all linear facilities, landscaping areas, and any other project elements) shall be delineated showing boundary lines of all construction areas and the location of all existing and proposed structures, pipelines, roads, and drainage facilities.

C. Watercourses and Critical Areas - The DESCP shall show the location of all nearby watercourses including swales, storm drains, and drainage ditches. The DESCP shall indicate the proximity of those features to the ESPRP construction, lay down, and landscape areas and all transmission and pipeline construction corridors.

D. Drainage Map - The DESCP shall provide topographic site map(s) at a minimum scale 1"=100' showing all existing, interim, and proposed drainage systems and drainage area boundaries. On the map, spot elevations and contours shall be extended off-site for a minimum distance of 100 feet.

E. Drainage Narrative - The DESCP shall include a narrative of the drainage measures to be taken to protect the site and downstream facilities and include the summary pages from the hydrologic analysis prepared by a professional engineer/erosion control specialist. The narrative shall state the watershed size(s) in acres used in the calculation of drainage control measures and text included that justifies their selection. The hydrologic analysis should be used to support the selection of Best Management Practices (BMPs) and structural controls to divert off-site and on-site drainage around or through the ~~ESPRP~~ construction and laydown areas.

F. Clearing and Grading Plans - The DESCP shall provide a delineation of all areas to be cleared of vegetation and areas to be preserved. The plan shall provide elevations, slopes, locations, and extent of all proposed grading as shown by contours, cross sections or other means. The locations of any disposal areas, fills, or other special features will also be shown. Illustrate existing and proposed topography tying in proposed contours with existing topography.

G. Clearing and Grading Narrative - The DESCP shall include a table with the quantities of material excavated or filled for the site and all project elements ~~of the ESPRP~~ (project site, lay down areas, transmission corridors, and pipeline corridors) to include those materials removed from the site due to demolition, whether such excavations or fill is temporary or permanent, and the amount of such material to be imported or exported.

The table shall distinguish whether such excavations or fill is temporary or permanent and the amount of material to be imported or exported.

H. Best Management Practices - The DESCP shall identify on a Water Pollution Control Drawing(s) (WPCD) the location of the site specific BMPs to be employed during each phase of construction (initial grading/demolition, excavation and construction, and final grading/stabilization). Treatment control BMPs used during construction should enable testing of stormwater runoff prior to discharge to the stormwater system. BMPs shall include measures designed to prevent wind and water erosion in areas with existing soil contamination.

I. Best Management Practices Narrative - The DESCP shall show the location (as identified on the WPCD), timing, and maintenance schedule of all erosion and sediment control BMPs to be used prior to grading/demolition, project excavation and construction, and final grading/stabilization (accomplished by the submittal of DESCP revisions). Text with supporting calculation shall be included for each project specific BMP. Separate BMP implementation schedules shall be provided for each project element.

Verification: No later than 90 days prior to the start of grading or excavation activities associated with any project element ~~of the ESPRP~~, the project owner shall submit a copy of the DESCP to the City of El Segundo (City) for review and comment. No later than 60 days prior to the start of grading or excavation activities associated with any project element ~~of the ESPRP~~, the project owner shall submit the DESCP and the City's comments to the CPM for review and approval. The CPM shall consider comments received from the City on the DESCP before issuing approval.

The DESCP shall be revised and a revision submitted to the CPM for project excavation/construction and final grading/stabilization prior to the soil disturbing activities associated with these stages of construction. The DESCP shall be consistent with the grading and drainage plan as required by condition of certification CIVIL-1 and relevant portions of the DESCP shall clearly show approval by the Chief Building Official. The DESCP shall be consistent with the Stormwater Pollution Prevention Plan (SWPPP) developed in accordance with the General Construction Permit (Water Quality Order 99-08-DWQ and any other subsequent orders) and the project's Standard Urban Stormwater Mitigation Plan developed in accordance with the LARWQCB NPDES Permit No. CAS0004001 and the City's Ordinance No. 1348 and Chapter 7 of Title 5 of the municipal code.

In the monthly compliance report, the project owner shall provide a narrative describing the effectiveness of the drainage, erosion and sediment control measures; the results of monitoring and maintenance activities, including any BMP inspection reports; and the dates of any dewatering activities.

WATER QUALITY-9 NPDES Permit for Storm Water Discharges During Operation: The project owner shall comply with the requirements of the Individual and/or General NPDES Permit for Storm Water Discharges Associated with Industrial Activity. The project owner shall develop and implement a Storm Water Pollution Prevention Plan (Industrial SWPPP) for the operation of the ESPRP. The Industrial SWPPP shall be reviewed and approved by the City of El Segundo (City) and shall be in compliance with the City of El Segundo's (City) Standard Urban Stormwater Mitigation Plan (SUSMP) per the requirements of the Los Angeles Regional Water Quality Control Board (LARWQCB) NPDES Permit No. CAS0004001 and the City's Ordinance No. 1348 and Chapter 7 of Title 5 of the municipal code.

Verification: The project owner shall submit to the CPM a copy of the Industrial SWPPP that includes the requirements of the City's SUSMP prior to commercial operation and retain a copy on-site. The project owner shall submit to the CPM copies of all correspondence between the project owner and the City, the LARWQCB, and the SWRCB regarding the City's SUSMP and the Individual and/or General NPDES Permit for Storm Water Discharges Associated with Industrial Activity within 10 days of its receipt or submittal. The Industrial SWPPP shall include a copy of the Notice of Intent for the project.

~~**WATER QUALITY-10 Ballast Water Management Plan**: The project owner shall ensure that each barge operator develops and implements a Ballast Water Management Plan in accordance with CCR Title 2, Division 3, Chapter 1, Article 4.6, The project owner shall ensure that the ballast water holding tanks are certified clean and uncontaminated by the California State Lands Commission prior to taking on local ballast water.~~

~~**Verification**: No later than 90 days prior to grounding of any barge associated with the delivery of ESPRP equipment over El Segundo Beach, the project owner shall provide the State Lands Commission with a copy of the Ballast Water Management Plan that is in compliance with Title 2, Division 3, Chapter 1, Article 4.6 for review and comment. At least 60 days prior to grounding of any barge associated with the delivery of ESPRP equipment over El Segundo Beach, the project owner shall provide the CPM for review and approval, a copy of the Ballast Water Management Plan that has been reviewed by the State Lands Commission.~~

WATER RES-3 Recycled Water Purchase Agreement: The project owner shall provide the CPM a copy of the executed and final recycled water purchase agreement (agreement) with West Basin Municipal Water District (WBMWD) for the long-term supply (30-35 years) of tertiary treated recycled water~~ to the ESPRP~~. The agreement shall specify a minimum delivery rate of 602-Qom. The agreement shall specify all terms and costs for the delivery and use of recycled water~~ by ESPRP~~. The shall not connect to WBMWD's new 10-inch recycled water pipeline without the final agreement in place and submitted to the CPM. The project owner shall comply with the requirements of Title 22 and Title 17 of the California Code of Regulations.

Verification: No later than 60 days prior to the delivery of single pass reverse osmosis recycled water from the new 10-inch pipeline, the project owner shall submit two copies of the final and executed recycled water purchase agreement for the supply and on-site use of recycled water~~ at the ESPRP~~. The project owner shall submit to the CPM a copy of the cross connection inspection and approval report from the Los Angeles County Health Department prior to the delivery of recycled water from the new 10-inch recycled water pipeline.

WATER RES-4 Potable Water Supply Agreement: The project owner shall use potable water supplied by the City of El Segundo (City) for potable and sanitary purposes only during construction of the ~~ESPRP~~ ESEC. Potable water shall not be used for any construction activity that is suitable for non-potable water use. In the event of a recycled water delivery interruption, potable water may be used as an emergency back-up supply for plant operation.

Prior to completion of the 14-inch potable water pipeline, the project owner shall provide the CPM with a copy of an executed and final Potable Water Supply Agreement (agreement) for the long-term supply (30–35 years) of potable water. The agreement shall specify a minimum delivery rate of 602-gpm in order to meet ~~ESPRP~~ ESEC's operation requirements in the event of a recycled water interruption. The project owner shall not use more than 4-AFY of potable water as an emergency backup source for ~~ESPRP~~ operation.

Verification: No later than 30 days prior to completion of the 14-inch potable water pipeline, the project owner shall submit to the CPM two copies of the executed and final Potable Water Supply Agreement (agreement). The project owner shall submit to the CPM any water quality monitoring reports required by the City in the annual compliance report. The project owner shall notify the CPM of any violations of the agreement terms and conditions, the actions taken or planned to bring the project back into compliance with the agreement, and the date compliance was reestablished.

WATER RES-5 Potable Water Meter Installation and Water Use Summary Report: The project owner shall use potable water supplied by the City of El Segundo (City) and recycled water supplied by the West Basin Municipal Water District (WBMWD) during ~~ESPRP~~operation. Prior to the use of water from any source for ~~ESPRP~~operation, the project owner shall install and maintain metering devices as part of the potable and recycled water supply and distribution systems. The metering devices shall be in operation for the life of the project. The project owner shall prepare an annual Water Use Summary that includes the monthly range and monthly average of daily potable and recycled water usage in gallons per day on a monthly basis and in acre-feet on an annual basis. For subsequent years, the annual Water Use Summary shall also include the yearly range and yearly average water use, by source, for the project. The annual Water Use Summary shall be submitted to the CPM as part of the annual compliance report.

Verification: At least 60 days prior to~~ESPRP~~ commercial operation, the project owner shall submit to the CPM evidence that metering devices have been installed and are operational on the potable and recycled water supply and distribution systems. The project owner shall submit a Water Use Summary report to the CPM in the annual compliance report. The report shall disaggregate potable water supplied by the City and recycled water supplied by WBMWD for ESEC ~~ESPRP~~ industrial and landscape irrigation use. The project owner shall provide a report on the servicing, testing and calibration of the metering devices in the annual compliance report.

3.11 Traffic and Transportation

This section describes and evaluates potential effects the proposed changes may have on traffic and transportation. Traffic data and intersection level of service (LOS) identified in 00-AFC-14 were reviewed along with recent transportation impact studies conducted by various parties and jurisdictions for the area to assess whether traffic conditions in the study area have changed significantly since the CEC Final Decision in 2005 and the subsequent PTAs. Compliance with applicable LORS is also addressed.

3.11.1 Amendment Overview

As discussed in detail in Section 2.0, Project Description, this PTA proposes modifications to the ESEC that necessitate evaluation of environmental impacts and potential amendments to existing COCs. The proposed PTA is for decommissioning, demolishing, and replacing the existing Units 3 and 4 steam boiler plants with approximately 449 MW gross / 435 MW net of new natural-gas-fired electrical generating capacity, consisting of one combined-cycle train and two simple-cycle gas turbines. The air-cooled, combined-cycle train (CC Fast) will consist of a GTG (Unit 9), a an HRSG, and one STG (Unit 10), rated at 325 MW net. The simple cycle turbines (Units 11 and 12) will consist of two air-cooled Trent 60 ISE advanced aeroderivative gas turbines, each rated at 55 MW net / 58 MW gross. The GE turbine will be supported by a small (36 MMBtu/hr) auxiliary boiler that will be incorporated into the operation of the CC Fast. Removal of existing Units 3 and 4 will eliminate the remaining once-through ocean water cooling system at the ESGS site. The ESPFM will improve electricity generation by adding fast-start and dispatch flexibility capability to support southern California grid load balancing. Total site capacity (including the new equipment previously permitted) will not exceed 1,020 MW net—the rated capacity of previously retired Units 1 and 2, plus the capacity of the soon-to-be-retired Unit 3 and operating Unit 4, which will also be retired as part of the ESPFM.

3.11.2 Affected Environment

The ESPFM traffic study area is bounded by the Pacific Ocean to the west, Interstate 105 to the north, Aviation Boulevard to the east, and Rosecrans Avenue to the south. No major changes to the existing transportation infrastructure have occurred since preparation of 00-AFC-14 and the subsequent PTAs. The surrounding regional and local roadway networks are shown in Figures 3.11-1 and 3.11-2 and described below.

3.11.2.1 ESEC Amendments

The proposed ESPFM will result in modifications to the ESEC license (00-AFC-14C). Decommissioning, demolishing, and removing existing Units 3 and 4 and replacing them with new Units 9, 10, 11, and 12 will not result in new traffic and transportation impacts above those identified in the CEC’s amended license for 00-AFC-14 and as described in Section 2.0.

As described in Section 3.4 and 3.13, implementation of the ESPFM will generate and use similar amounts of hazardous materials and subsequent similar truck trips traveling to and from the site as was generated by the removal of Units 1 and 2 and the construction of Units 5 through 8.

The following is a brief description of the areas covered by each existing COC:

TRANS-1 Overweight & Oversize Vehicles
TRANS-2 Encroachment Permits
TRANS-3 Licensed Hazardous Materials Haulers
TRANS-4 Off-Site Parking and Staging Plan
TRANS-5 Traffic Control Plan
TRANS-6 Aircraft Hazard Markings
TRANS-7 Roadway Repairs

ESEC LLC has implemented standard operating procedures which require that traffic and transportation procedures be maintained to reflect current site conditions. As such, the project owner will continue to comply with the requirements set forth in these COCs and will provide updates regarding the demolition and construction-related traffic as well as ongoing operational traffic and transportation procedures, as necessary.

3.11.2.2 Surrounding Road Network

Land uses in the project vicinity are a mixture of industrial and open space, with some residential and commercial uses. The nearest port facilities are the ports of Los Angeles and Long Beach, approximately 10 miles to the south. Commercial and passenger rail facilities are located approximately 2 miles east of the project site.

Interstate 405 (I-405) (San Diego Freeway), located about 4 miles east of the project site, is a north-south freeway providing regional access to the coastal communities on the west side of Los Angeles. I-405 has four lanes in each direction, not including the auxiliary lanes. A High Occupancy Vehicle (HOV) lane is provided between Century Boulevard and Vermont Avenue.

Interstate 105 (I-105) (Glenn M. Anderson Freeway), located about 2 miles north of the project site, is an east-west freeway extending from Sepulveda Boulevard on the west to the San Gabriel Freeway (I-605) on the east. I-105 provides three mixed flow lanes and one HOV lane in each direction, for a total of eight lanes. The Los Angeles County Metropolitan Transportation Authority (LAMTA) operates the Metro Green Line commuter rail service, located in the center median of the freeway. The Green Line's airport station is located at Aviation Boulevard.

Aviation Boulevard is a major arterial, four-lane divided roadway, providing north-south access through the cities of El Segundo and Manhattan Beach.

El Segundo Boulevard is an east-west secondary arterial from Vista Del Mar on the west to Sepulveda Boulevard on the east. It is considered a major arterial east of Sepulveda Boulevard. El Segundo Boulevard is approximately one mile from the project site, and connects traffic from collector streets on the west side of El Segundo to the I-405 and the regional freeway system. The City of El Segundo General Plan identifies El Segundo Boulevard as truck route.

Grand Avenue is an east-west secondary arterial, four-lane undivided roadway from Vista Del Mar on the west to Sepulveda Boulevard. East of Sepulveda Boulevard, Grand Avenue is a six-lane divided roadway.

Imperial Highway is an east-west secondary arterial, four-lane divided roadway from Main Street on the west to Sepulveda Boulevard. East of Sepulveda Boulevard, Imperial Highway is a six-lane divided roadway.

Main Street is a north-south collector road, four-lane undivided roadway from north of Grand Avenue to El Segundo Boulevard.

Rosecrans Avenue is an east-west major arterial, five-lane divided roadway with three westbound lanes and two eastbound lanes from the westerly boundary of Manhattan Beach to Sepulveda Boulevard. East of Sepulveda Boulevard, Rosecrans Avenue is a six-lane divided roadway. Rosecrans Avenue borders the southerly perimeter of the Chevron Refinery.

Sepulveda Boulevard is a north-south eight-lane divided major arterial providing connections to I-405 north of Los Angeles International Airport (LAX) via Howard Hughes Parkway, and to I-105 south of LAX. Sepulveda Boulevard provides access to communities north of LAX (such as Culver City and Westchester) as well as the South Bay communities. Sepulveda Boulevard is designated State Route 1 (SR-1) from Lincoln Boulevard on the north to Pacific Coast Highway on the south.

Vista Del Mar is a north-south secondary arterial, four-lane undivided roadway, and is designated a truck route. Vista Del Mar bounds the easterly perimeter of the project site. Access to the plant site is provided via Vista Del Mar at the southern end of the ESGS.

3.11.2.3 Existing Traffic Conditions

The AFC (00-AFC-14) evaluated intersection operations based on LOS for existing and existing plus ESEC construction conditions. LOS is a measure of vehicle delay (i.e., the average amount of time a vehicle must wait before proceeding through an intersection). LOS is identified by a letter designation from A to F, with A as the optimum operating LOS and F designating service as very poor. The City of El Segundo and California Department of Transportation (Caltrans) goal for peak hour intersection operation is LOS D or better.

Based on the locations of the construction worker parking lots and the laydown areas, the following intersections were analyzed for the AM and PM peak hours as part of 00-AFC-14, subsequent PTAs, and this PTA:

1. Vista Del Mar/Grand Avenue
2. Vista Del Mar/El Segundo Generating Station Driveway
3. Vista Del Mar/45th Street
4. Vista Del Mar/Rosecrans Avenue
5. Pershing Drive/Imperial Highway
6. Main Street/Grand Avenue
7. Main Street/El Segundo Boulevard
8. Sepulveda Boulevard/Imperial Highway
9. Sepulveda Boulevard/Grand Avenue
10. Sepulveda Boulevard/El Segundo Boulevard
11. Sepulveda Boulevard/Rosecrans Avenue
12. Aviation Boulevard/El Segundo Boulevard
13. Aviation Boulevard/Rosecrans Avenue

The intersection locations are presented in Figure 3.11-3. As part of this ESPFM PTA, traffic data and intersection LOS from the 00-AFC-14, subsequent PTAs and recent transportation impact studies conducted for the area were reviewed to assess whether traffic conditions in the study area have changed significantly since the preparation of the 00-AFC-14. A comparison of the intersection LOS (for locations where data is available) is presented in Table 3.11-1.

3.11.2.4 Other Transportation Facilities

3.11.2.4.1 Bus Routes

Existing bus routes, commuter and freight rail lines, airports, bike lanes, truck routes, and pedestrian walking streets exist within the project area, similar to that depicted in the CEC Final Decision and in subsequent PTAs. Bus service in the El Segundo area is provided by: Los Angeles County Metropolitan Transportation Authority (LACMTA or MTA), Torrance Transit System, Santa Monica Municipal Bus Line, Municipal Area Express, and Westchester Shuttle System. Access to the project site via public transit service is provided through the following bus routes:

- I-105 (Bus Routes 220 and 439) to Vista Del Mar;
- Grand Avenue (Bus routes 124, 125 and 439) to Highland Avenue;
- Highland Avenue (Bus routes 438, 125 and 439) connecting Grand Avenue and Rosecrans Avenue; and
- Rosecrans Avenue (Bus route 125) connecting to Aviation Boulevard.

Fixed bus routes are assigned along these routes and are operated by the Southern California Rapid Transit District (SCRTD) and a Dial-a-Ride service operated by the City of El Segundo. Bus route 438 along Vista Del Mar and Highland Avenue is a privately operated line.

Additional bus routes within the project study area include Routes 225, 226, 232, 1, 2, 3, and 8. None of these routes pass directly by ESGS, but each contributes to the regional public access to the project vicinity.

TABLE 3.11-1
Comparison of Study Intersection LOS from 2000 to 2011

Study Intersection	Year 2000[a]		Year 2007[b]		Year 2009[c]		Year 2011[d]	
	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour
Vista Del Mar/Grand Avenue	C	B	9.7 – A	7.6 – A	N/A	N/A	N/A	N/A
Vista Del Mar/El Segundo Generating Station Driveway	N/A	N/A	9.9 – A	**58.0 – F**	N/A	N/A	N/A	N/A
Vista Del Mar/45th Street	C	B	5.1 – A	4.5 – A	N/A	N/A	N/A	N/A
Vista Del Mar/Rosecrans Avenue	F	E	28.9 – C	28.9 – C	N/A	N/A	N/A	N/A
Pershing Drive/Imperial Highway	B	B	**22.3 – C**	15.7 – B	N/A	N/A	N/A	N/A
Main Street/Grand Avenue	N/A	N/A	14.4 – B	13.9 – B	.326/A	.398/A	N/A	N/A
Main Street/El Segundo Boulevard	N/A	N/A	10.1 – B	11.4 – B	N/A	N/A	N/A	N/A
Sepulveda Boulevard/Imperial Highway	D	F	25.6 – C	28.1 – C	34.8/D	27.0/C	30.6/C	51.9/D
Sepulveda Boulevard/Grand Avenue	N/A	N/A	34.3 – C	29.7 – C	21.0/C	**28.7/D**	N/A	N/A
Sepulveda Boulevard/El Segundo Boulevard	E	F	35.2 – D	136.2 – F	24.3/C	32.5/D	N/A	N/A
Sepulveda Boulevard/Rosecrans Avenue	F	F	27.2 – C	75.3 – E	N/A	N/A	N/A	N/A
Aviation Boulevard/El Segundo Boulevard	D	C	53.8 – D	**79.9 – E**	N/A	N/A	N/A	N/A
Aviation Boulevard/Rosecrans Avenue	F	F	24.9 – C	28.0 – C	N/A	N/A	N/A	N/A

[a]Application for Certification (AFC), El Segundo Power Redevelopment (ESPR), filed with the California Energy Commission (CEC), August 2000 (prepared by URS Corporation).

[b]PTA. Final Commission Decision for the El Segundo Power Redevelopment Project (Shaw Environmental Inc., June 2007)

[c]El Segundo Aquatics Site Feasibility Alternatives Project DEIR, Volume II Appendices (Rincon, April 2011)

[d]540 East Imperial Avenue Specific Plan Traffic Impact Analysis (Kimley Horn and Associates, Inc, June 2011)

N/A = Current data not available for this location

3.11.2.4.2 Commercial Rail

The Burlington Northern-Santa Fe (BNSF) and Union Pacific railroads operate active freight spur tracks in the project vicinity. The BNSF line joins the Union Pacific line approximately 1.5 miles from the project site. The westerly terminus of the Union Pacific line is approximately 0.5 mile northeast of the project site within the Chevron Refinery. The BNSF and Union Pacific lines may be utilized for transporting construction materials during project construction.

3.11.2.4.3 Passenger Rail

Amtrak – Amtrak's intercity passenger rail system serves Los Angeles Union Station, in downtown Los Angeles, with statewide and nationwide service. Commuter rail and rapid transit services other than Amtrak that operate within the region are the Metro Blue and Green Lines.

MTA Metro Green Line – The MTA's Metro Green Line is a light rail line, running east-west through Los Angeles County, serving the communities of Norwalk, Downey, Lynwood, Watts, Inglewood, Lennox, El Segundo, Manhattan Beach, and Redondo Beach. The Metro Green Line proceeds westerly near Studebaker Road in Norwalk and travels for about 17 miles along the median of the I-105 Freeway. The line transitions southerly from the freeway structure after the Aviation station. The Green Line continues south along an exclusive elevated right-of-way, ending its run at Marine Avenue in northeastern Redondo Beach.

A Park and Ride facility, located approximately 2.5 miles east of the project site at El Segundo Boulevard and Nash Street, serves commuters utilizing the Metro Green Line.

MTA Metro Blue Line – The MTA's Metro Blue Line, a light rail transit system, runs from 7th Street in downtown Los Angeles, through the communities of Vernon, Huntington Park, South Gate, Watts, Compton, Carson, and Long Beach. At the Imperial/Wilmington station, passengers may transfer to the Metro Green Line, which continues toward Norwalk or El Segundo.

3.11.2.4.4 Bicycle and Pedestrian Circulation

Table 3.11-2 (Area Bike Routes) summarizes bike routes in the area by Class.

TABLE 3.11-2
Area Bike Routes

Adjacent to/on	Class*
Imperial Highway (Vista Del Mar to Hillcrest)	I
Imperial Highway (Hillcrest to Sepulveda)	II or III
Imperial Highway (Sepulveda to I-405)	II
Vista Del Mar (along beach)	I
Grand Avenue (Vista Del Mar to Loma Vista)	I
Grand Avenue (Loma Vista to Douglas)	III
El Segundo Boulevard (Vista Del Mar to Loma Vista)	I
El Segundo Boulevard (Loma Vista to Aviation)	II or III
Rosecrans (Vista Del Mar to Sepulveda)	II or III
Rosecrans (Sepulveda to I-405)	III
Sepulveda (Rosecrans to Grand)	I or III
Sepulveda (Grand to Imperial Hwy)	III

*Bicycle facilities are typically categorized into three classes: Class I, Class II, and Class III. Class I facilities are bike paths or trails with an exclusive right-of-way (ROW) for bicycles separate from vehicles. Class II facilities are bike lanes with an exclusive ROW for bicycles designated by roadway striping and signs. Class III facilities are bike routes signed for shared travel with motorized vehicles, without any striping.
Source: City of El Segundo, General Plan, 2004.

3.11.2.4.5 Movement of Goods

The City of El Segundo has designated truck routes on streets where vehicles in excess of three tons may travel. Existing truck routes are provided with appropriate signage to guide truck traffic through the City. Truck routes that provide access to and from the ESGS site include Vista Del Mar, Imperial Highway, Grand Avenue and Sepulveda Boulevard. The City's truck routes follow the arterial street system.

3.11.3 Environmental Analysis

In general, the LOS included in the 00-AFC-14 provides the most conservative calculation of intersection operations. Four of the study intersections were either not analyzed in 00-AFC-14 or the LOS was found to be worse based on more recent traffic counts. These intersections are shown in bold in Table 3.11-1 and discussed below.

The Vista Del Mar/ESGS driveway was evaluated in 2007 only and was found to be operating at LOS F during the PM peak hour. Improvements have been made to the ESGS driveway since 00-AFC-14 to improve ingress/egress to the site and operate at an acceptable LOS.

The Pershing Drive/Imperial Highway intersection was determined to be operating at LOS B during the AM peak hour in 2000. Based on traffic counts from 2007, the intersection was found to be operating at LOS C during the AM peak hour.

The Sepulveda Boulevard/Grand Avenue intersection was not included in 00-AFC-14. Based on traffic counts from 2009, the intersection is currently operating at LOS C during the AM peak hour and LOS D during the PM peak hour.

Finally, during the PM peak hour, the Aviation Boulevard/El Segundo Boulevard intersection was determined to be operating at LOS C in 2000 and LOS E in 2007.

3.11.3.1 Construction Project Trip Generation

Consistent with the 00-AFC-14 and subsequent PTAs, traffic impacts associated with the peak construction period have been conservatively evaluated. Implementation of the ESPFM will require a result in similar construction schedule and activities as was previously analyzed in 00-AFC-14. As a result, it is assumed that the traffic generated from the ESPFM (workforce trips, daily truck deliveries, and heavy equipment delivery) would be similar to the estimate used in 00-AFC-14. The project construction trips are discussed in further detail below.

3.11.3.1.1 Workforce Trips

The number of construction workers will fluctuate throughout the 20-month construction period, with the peak construction effort onsite occurring during Month 11, when 422 workers are projected. Based on this assumption, the ESPFM would generate a total of 844 daily auto trips, with 422 trips occurring during the morning peak hour and 422 trips occurring during the afternoon peak hour.

3.11.3.1.2 Truck Trips

The number of truck deliveries and heavy equipment deliveries is also assumed to be the same as 00-AFC-14 estimate. Truck deliveries will be spread throughout the day, beginning at approximately 6:00 AM and ending at approximately 6:00 PM. The truck trips will peak during Month 6 when 29 deliveries per day are expected.

3.11.3.1.3 Oversize Equipment Delivery

Most of the heavy machinery and items will be transported by rail to the common shipping depot nearest the project site, at the Chevron Refinery. These rail deliveries will be off-loaded and transported to the project site by common carrier. Some of these items may be delivered by ship and then transferred to by rail or carrier for delivery to the site. Heavy equipment will be delivered for only five months (Months 5 through 9). At the peak (Month 8) 19 deliveries per day are expected to the generating facility.

3.11.3.2 Construction Project Trip Distribution

Overall construction worker travel is similar to the levels identified in 00-AFC-14 for the previously permitted project. The workforce distribution is assumed to be as follows:

- 20 percent from north of the airport (84 employees);
- 25 percent from northeast of the airport (106 employees);
- 25 percent from the east (106 employees);
- 5 percent from El Segundo (20 employees); and
- 25 percent from south of the project site (106 employees).

Construction workforce parking will be established onsite and/or at an offsite construction laydown area near the ESGS site. Construction workers will be transported to and from the established offsite location at the beginning and end of each work shift. The off-site parking will likely be located at one of the lots previously identified in 00-AFC-14 and PTA, which include the following:

- Fed Ex site
- LAX Pershing site
- County/State Beaches
- W. 190th Street

Based on the location of the parking lots identified above, it is assumed that the following roadways would be used to reach the parking lots.

TABLE 3.11-3
Roadways Traveled Per Parking Lot Location

Fed Ex Site	LAX Pershing Site	County/State Beaches	W. 190th Street
Sepulveda Boulevard	Vista Del Mar	Vista Del Mar	I-110/I-405 interchange
Aviation Boulevard	Pershing Drive	Imperial Highway	W. 190th Street
Nash Street	Imperial Highway	Rosecrans Avenue	
El Segundo Boulevard	Rosecrans Avenue		
Mariposa Avenue			
Grand Avenue			

The delivery of equipment will use the routes identified in the 2007 and 2010 PTA and Supplement. No beach delivery is planned.

3.11.3.3 Construction Project Traffic Impacts

As previously identified in the 00-AFC-14 and reflected in the CEC Final Decision, most of the traffic produced during AM and PM peak hours would be from construction workers arriving and departing the designated parking lots. A maximum of 844 daily trips and 422 peak hour trips is estimated during the peak construction period. Based on a review of the existing traffic conditions in the area, the study intersections are generally operating at a similar and in some cases, better LOS than previously estimated in 2000. Since the number of construction workforce trips and distribution patterns is assumed to be the same as was previously identified in 00-AFC-14, the proposed modifications would result in similar impacts as those identified in 00-AF-14. These volumes do not result in a significant adverse impact because the project would not reduce the LOS below the current daily LOS. In addition, these increases would be short-term, occurring only during the peak construction period. Furthermore, 00-FC-14 determined that the project-added trips would not cause the intersections to drop below their existing LOS. To minimize the temporary increase in traffic, the project will continue to implement the Conditions of Certification that were required for the previously permitted project.

The influx of construction vehicles and delivery trucks on the roadways from the ESPFM is minimal compared to existing truck traffic and will represent a negligible increase in truck traffic along the proposed routes of travel. At the peak, only 29 daily truck deliveries are anticipated. Therefore, the impact of construction-related truck traffic will not be significant.

Finally, no impacts to parking and other transportation facilities (transit, rail, etc.) are anticipated as a result of the project modifications. The construction workforce will use the designated off-site parking lot(s).

3.11.3.3.1 Delivery Hazardous Materials Storage and Use

The demolition and removal of Units 3 and 4 and the installation and operation of new Units 9–12 will result in minimal changes to the existing aqueous ammonia system as described in Sections 2.3 and 2.8.1. There is a potential for the ESPFM to result in changes in the frequency of aqueous ammonia deliveries; however, system upgrades and changes in operating conditions will not be required. In addition, as described in Section 2.8.1, a variety of chemicals will be stored and used during construction and operation of the facility. The removal of Units 3 and 4 and subsequent discontinuation of the once-through cooling system eliminates the need to store and use chlorine for biological growth control which will result in less truck delivery impacts. Therefore, implementation of the ESPFM will result in lower potential impacts from the delivery of hazardous materials and will be mitigated by conformance with the requirements included in COCs TRANS-3 and TRANS-5.

3.11.3.3.2 Offsite Construction Laydown and Construction Worker Parking Areas

The preferred offsite laydown area, located at 777 W. 190th Street in the City of Gardena, was incorporated into ESEC in the 2010 PTA decision and will continue to be used for ESPFM. Construction laydown and parking areas will also be established within the ESGS site boundary, as well as at offsite areas identified in the CEC Final Decision and shown on Figure 2-10. The 190th Street area is less than ten miles southeast of the ESGS and is easily accessible to the I-405 and I-110 North freeways from Vermont Avenue and 190th Street as well as to ESEC-approved traffic/truck routes. This site, zoned M2, commercial, has approximately ten usable acres and includes a 5,500 square-foot industrial building. The approximately 12.1-acre site paved with asphalt has nightlighting and includes a perimeter security fence. No site preparation other than minor clean-up is required prior to use. The existing COCs ensure that construction-related traffic activities at the approved laydown areas will comply with appropriate traffic management plans.

3.11.4 Cumulative Impacts

The proposed project changes will not result in any significant cumulative impacts to traffic and transportation beyond those addressed in the CEC Final Decision.

3.11.5 Laws, Ordinances, Regulations, and Standards

The CEC Final Decision found the project to be in compliance with all applicable LORS. As described in this PTA, the proposed ESPFM is consistent with applicable traffic and transportation-related LORS and the Amendment will not alter the assumptions or conclusions made in the CEC's Final Decisionand no additional or revised LORS compliance have been identified.

3.11.6 Conditions of Certification

The traffic and transportation requirements subject to approved COCs TRANS-1 through TRANS-7 are adequate to address any new potential impacts of ESPFM. The analysis concludes that no modifications to the COCs set forth in the previously permitted project are necessary and no new COCs are required. These COCs are provided below.

TRANS-1 Overweight & Oversize Vehicles: The project owner shall comply with Caltrans and other relevant jurisdictions limitations on vehicle sizes and weights. In addition, the project owner or its contractor shall obtain necessary transportation permits from Caltrans and all relevant jurisdictions for roadway use.

Verification: In the Monthly Compliance Reports, the project owner shall submit copies of any permits received during that reporting period. In addition, the project owner shall retain copies of these permits and supporting documentation in its compliance file for at least six months after the start of commercial operation.

TRANS-2 Encroachment Permits: The project owner or its contractor shall comply with Caltrans and other relevant jurisdictions limitations for encroachment into public rights-of-way and shall obtain necessary encroachment permits from Caltrans and all relevant jurisdictions.

Verification: In Monthly Compliance Reports, the project owner shall submit copies of permits received during the reporting period. In addition, the project owner shall retain copies of these permits and supporting documentation in its compliance file for at least six months after the start of commercial operation.

TRANS-3 Licensed Hazardous Materials Haulers: The project owner shall ensure that permits and/or licenses are secured from the California Highway Patrol and Caltrans for the transport of hazardous materials.

Verification: The project owner shall include in its Monthly Compliance Reports, copies of all permits/licenses acquired by the project owner and/or subcontractors concerning the transport of hazardous substances.

TRANS-4 Off-Site Parking and Staging Plan: During construction of the power plant and all related facilities, the project shall develop a parking and staging plan for all phases of project construction to enforce a policy that all project-related parking occurs on-site or in designated off-site parking areas.

Verification: At least 60 days prior to start of site mobilization, the project owner shall submit the plan to the City of El Segundo and other jurisdictions affected by site selection, such as the City and/or County of Los Angeles for review and comment, and to the CPM for review and approval.

TRANS-5 Traffic Control Plan: The project owner shall consult with the Cities of El Segundo, Manhattan Beach and Los Angeles, and prepare and submit to the CPM for approval a construction traffic control plan and implementation program which addresses the following issues:

- Timing of heavy equipment and building materials deliveries;
- Redirecting construction traffic with a flag person;
- Signing, lighting, and traffic control device placement if required;
- Need for construction work hours and arrival/departure times outside of peak traffic periods;
- Ensure access for emergency vehicles to the project site;
- Temporary travel lane closure;
- Access to adjacent residential and commercial property during the construction of all pipelines;
- Specify construction related haul routes; and
- Identify safety procedures for exiting and entering the site access gate.

Verification: At least 30 days prior to site mobilization, the project owner shall provide to the CPM a copy of the referenced documents.

TRANS-6 Aircraft Hazard Markings: The HRSG stacks shall have all the lighting and marking required by the Federal Aviation Authority (FAA) so that the stacks do not create a hazard to air navigation. The project owner shall submit to the FAA Form 7460-1, Notice of Proposed Construction or Alteration and supporting documents on how the project plans to comply with stack lighting and marking requirements imposed by the FAA.

Verification: At least 30 days prior to the start of construction, the project owner shall provide copies of the FAA Form 7460-1 with copies of the FAA response to Form 7460-1, to the CPM and the City of El Segundo Planning Department.

TRANS-7 Roadway Repairs: Following completion of project construction, the project owner shall repair any damage to the segment of Vista Del Mar and other roadways affected by construction activity along with the primary roadways identified in the traffic control plan for construction traffic to the road's pre-project construction condition. Prior to the start of construction, the project owner shall photograph, videotape or digitally record images of Vista Del Mar and the roadways that will be affected by pipeline construction and heavy construction traffic. The project owner shall provide the Compliance Project Manager (CPM), and the Cities of El Segundo, Manhattan Beach and Los Angeles with a copy of the images for the roadway segments under their jurisdiction. Also prior to start of construction, the project owner shall notify those cities about the schedule for project construction. The purpose of this notification is to postpone any planned roadway resurfacing and/or improvement projects until after the project construction has taken place and to coordinate construction related activities associated with other projects.

Verification: Within 30 days after completion of the redevelopment project, the project owner shall meet with the CPM and the Cities of El Segundo, Manhattan Beach, and Los Angeles to determine and receive approval for the actions necessary and schedule to complete the repair of identified sections of public roadways to original or as near original condition as possible. Following completion of any regional road improvements, the project owner shall provide to the CPM a letter from the Cities of El Segundo, Manhattan Beach and Los Angeles if work occurred within their jurisdictional public right of way stating their satisfaction with the road improvements.

3.11.7 References

California Energy Commission. 2000. Rules of Practice and Procedure & Power Plant Site Certification Regulations, August 2000.

California Energy Commission. 2002a. EFS & EPD Traffic and Transportation, December 17, 2000

California Energy Commission. 2002b. Final Staff Assessment, El Segundo Power Redevelopment Project, 00-AFC-14, September 2002.

California Energy Commission. 2002c. Commission Decision, El Segundo Power Redevelopment Project, 00-AFC-14, February 2005.

California Energy Commission. 2007. PTA, Final Commission Decision for the El Segundo Power Redevelopment Project (Shaw Environmental Inc., June 2007)

City of El Segundo. El Segundo Circulation Element Update, Draft Environmental Impact Report. 2000.

City of El Segundo. 2004. El Segundo Circulation Element. September.

Kimley Horn and Associates, Inc. 2011. 540 East Imperial Avenue Specific Plan Traffic Impact Analysis. June.

Rincon. 2011. El Segundo Aquatics Site Feasibility Alternatives Project DEIR, Volume II Appendices. April.

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

FIGURE 3.11-1
Regional Road Network
El Segundo Power Facility Modification
April 2013 Petition to Amend 00-AFC-14
El Segundo, California

CH2MHILL

ES041213002824SCO

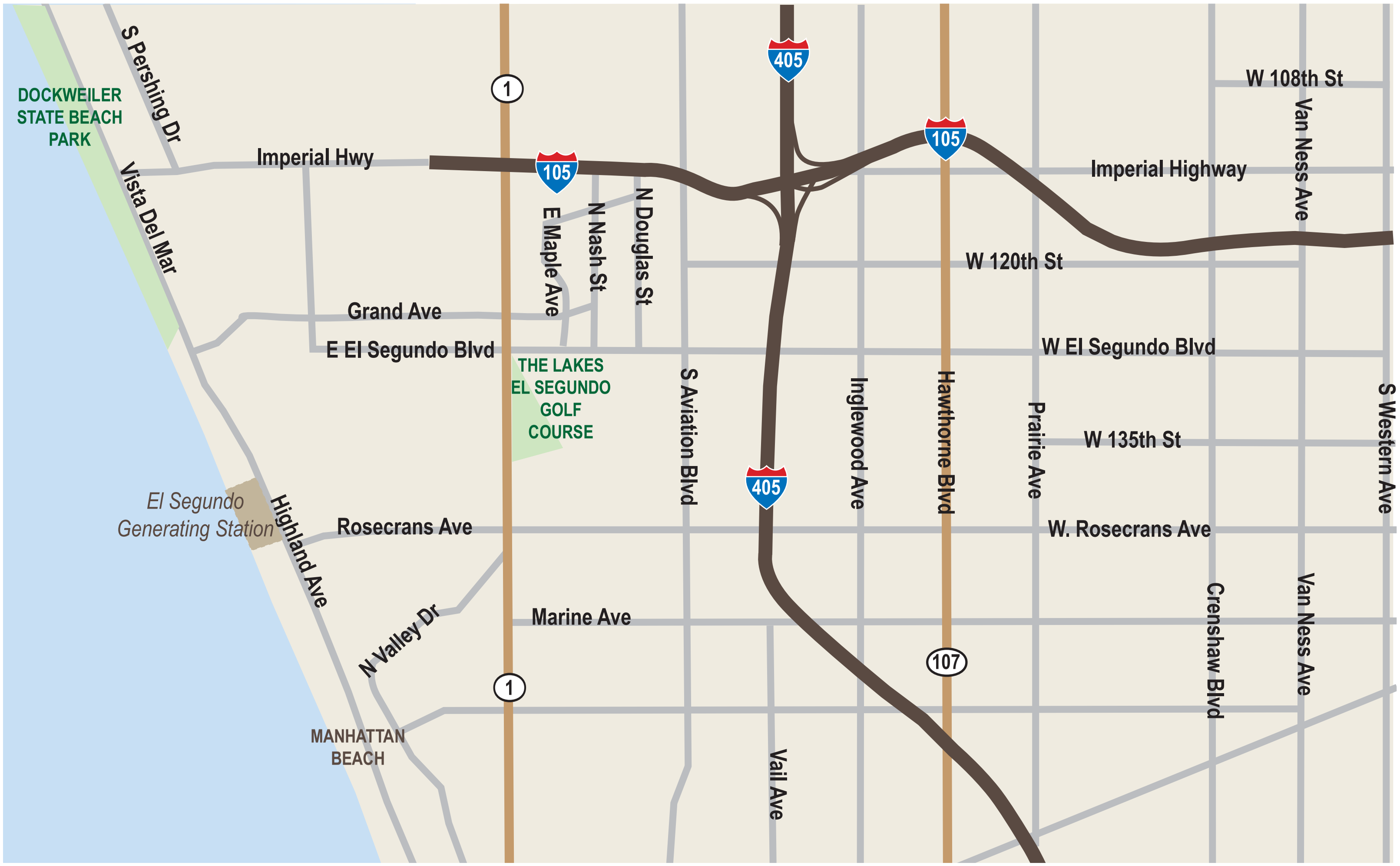

FIGURE 3.11-2
Local Road Network
El Segundo Power Facility Modification
April 2013 Petition to Amend 00-AFC-14
El Segundo, California

ES041213002824SCO

CH2MHILL

FIGURE 3.11-3
Study Intersections
El Segundo Power Facility Modification
April 2013 Petition to Amend 00-AFC-14
El Segundo, California

CH2MHILL

3.12 Visual Resources

Visual resources are the natural and cultural features of the environment that can be seen and that contribute to the public's enjoyment of the environment. Visual resource or aesthetic impacts are generally defined in terms of a project's physical characteristics and potential visibility, and the extent that the project's presence would change the visual character and quality of the environment in which it would be located. This section describes and evaluates potential effects the proposed changes may have on visual resources. Compliance with applicable LORS is also addressed.

3.12.1 Amendment Overview

As discussed in detail in Section 2.0, Project Description, this PTA proposes modifications to the ESEC that necessitate evaluation of environmental impacts and potential amendments to existing COCs. The proposed PTA is for decommissioning, demolishing, and replacing the existing Units 3 and 4 steam boiler plants with approximately 449 MW gross / 435 MW net of new natural-gas-fired electrical generating capacity, consisting of one combined-cycle train and two simple-cycle gas turbines. The air-cooled, combined-cycle train (CC Fast) will consist of a GTG (Unit 9), a an HRSG, and one STG (Unit 10), rated at 325 MW net. The simple cycle turbines (Units 11 and 12) will consist of two air-cooled Trent 60 ISE advanced aeroderivative gas turbines, each rated at 55 MW net / 58 MW gross. The GE turbine will be supported by a small (36 MMBtu/hr) auxiliary boiler that will be incorporated into the operation of the CC Fast. Removal of existing Units 3 and 4 will eliminate the remaining once-through ocean water cooling system at the ESGS site. The ESPFM will improve electricity generation by adding fast-start and dispatch flexibility capability to support southern California grid load balancing. Total site capacity (including the new equipment previously permitted) will not exceed 1,020 MW net—the rated capacity of previously retired Units 1 and 2, plus the capacity of the soon-to-be-retired Unit 3 and operating Unit 4, which will also be retired as part of the ESPFM.

3.12.2 Affected Environment

3.12.2.1 ESEC Amendments

The proposed ESFPM will result in amendments to the ESEC license (00-AFC-14C). With respect to visual resources, the proposed modifications will result in alterations to the appearance of the licensed ESEC. To provide a basis for documenting and evaluating any changes to the environmental baseline for visual resources, the current views from each of the Key Observation Points (KOP) used in preparing previous AFC and 2007 PTA visual analyses were observed and photo-documented. Views from additional observation points were also photo-documented. Figure 3.12-1 is a map of the project area on an air photo base that illustrates the locations of KOPs 1, 2, 3, 7 and 8 from the AFC and 2007 PTA visual analyses, and KOP 10, which is a new view from The Strand, Manhattan Beach, selected for analysis of the proposed project. Figures 3.12-2 through 3.12-7 include images that depict the baseline conditions visible from each of the KOPs (the "a," or "baseline" image in each figure).

For this analysis, the appropriate baseline views are views of the ESEC site as it would appear at completion as approved in the original 2005 license and 2007 and 2010 amendments. Because development of the approved ESEC project is still underway, photos of the current views from each of the KOPs were amended to simulate the approved project features whose construction is near complete. The photos of the existing views toward the ESEC site were modified to include not only the completed changes to Units 5 and 7, but also the sea wall, landscaping, and other visual enhancement features required by the COCs in the 2005 license and the 2007 and 2010 amendments. The landscaping for the baseline was rendered to depict its appearance one year after completion. For this PTA, the landscaping with the ESPFM was rendered at year 5 after installation of the landscaping.

The ESEC's current visual resources conditions of certification assure that ESEC did not and will not cause any significant impacts to visual resources. The ESEC currently has nine COCs. Several conditions require slight adjustment to facilitate the proposed changes to the facility and ensure that ESEC continues to enhance and complement the community aesthetically. The project owner also proposes one new COC, Visual Resources

(VIS)-10, to ensure that onsite landscaping changes required for the proposed changes to the ESEC do not adversely affect the visual treatment provided for in the project. Below is a summary of the proposed treatment of the visual resources conditions of certification.

- **VIS-1 Facility Visual Enhancement Plan:** ***No changes*** to this condition, but to address changes to onsite landscaping, new condition VIS-10 is proposed.
- **VIS-2 Perimeter Screening and On-site Landscaping**: ***No changes*** to this condition, but to address changes to onsite landscaping, new condition VIS -10 is proposed.
- **VIS-3 Design Treatment of Seawall:** ***No changes*** to this condition, the proposed changes will not directly affect the seawall nor necessitate any modifications to the seawall.
- **VIS-4: No longer in decision**. Vis-4 was deleted by change to the ESEC final decision approved in 2008.
- **VIS-5 Structure Surface Painting:** ***Proposed change*** to this condition to address structure surface color selections for the new units and equipment.
- **VIS-6 Project Lighting:** ***Proposed change*** to this condition to apply the same lighting design standards required for Units 5, 6, 7, and 8, to the new proposed units and equipment. Note that there was a typographical error in this condition, wherein Unit 8 was not listed. This error is being corrected in the proposed change to this condition also.
- **VIS-7 Site Lighting:** ***No changes*** to this condition. VIS-7 required the project owner to change the lighting on or associated with Units 3 and 4 to ensure that the those lights did not cause significant impacts to the community when that lighting became more visible to the residents of the City of Manhattan Beach. The lighting changes were also completed as an overall project benefit, in that the ESEC project was reducing glare and excess lighting from the older areas of the facility that were not yet being modified by the project. The proposed changes in this PTA will remove all of that lighting and the proposed changes to VIS-6 will ensure that all new lighting meets the required standards and expectations for lighting at ESEC.
- **VIS-8 Construction Lighting:** ***Proposed change*** to this condition to apply the same construction lighting requirements required for the original construction to the construction proposed by this PTA.
- **VIS-9 Temporary Landscaping and 45th Street Berm:** ***No changes*** to this condition. VIS-9 was a one-time condition that required certain landscaping be accomplished earlier in the overall construction cycle.

3.12.3 Environmental Analysis

3.12.3.1 Analysis Procedure

Visual analyses prepared for the ESEC for the original 2005 license and the license amendments issued in 2007 and 2010 determined that the visual effects of the ESEC project, with mitigation, would be less than significant. The goal of this analysis was to determine whether the ESPFM that would be permitted by the proposed amendment would alter the baseline conditions at the ESEC site in a way that would change this finding of less-than-significant impact. To make this determination, updated site reconnaissance and photography was conducted and visual simulations were prepared to depict the baseline conditions that would exist with completion of the approved ESEC facilities, and the visual conditions that would exist with implementation of the changes requested under the proposed amendment. A systematic comparison was then made of the simulations depicting the baseline views and the views that would exist with implementation of the changes to the ESEC project requested in the amendment. The goal of the comparison was to determine whether the changes brought about by the amendment would adversely affect the appearance of the site and create impacts that would exceed those of the approved ESEC project to the extent that they would be so substantial as to be significant. Comparisons were made of the visual conditions in the views from each KOP seen in the baseline and in the amendment simulations. In addition, an overall assessment was made of the visual changes that would be brought about by the amendment in terms of the four questions the California Environmental Quality Act Guidelines have established to determine the significance of visual impacts.

3.12.3.2 Assessment of Visual Effects from Key Observation Points

Nine KOPs have been identified and used as part of previous visual analyses. Five of these views— KOPs 1, 2, 3, 7, and 8— were deemed adequate for determination of visual impacts by CEC in the 2010 Final Revised Staff Analysis for the El Segundo Power Redevelopment Project. This analysis relies on these five established KOPs and an additional KOP—KOP 10, selected to represent an additional view from the south of the project site—to determine the visual effects of the currently proposed project. All KOPs are described in greater detail below.

Existing conditions described in this section were observed and documented during field work conducted in December 2012 and March 2013 by CH2M HILL staff. As previously noted, the photos of the existing conditions were modified to simulate in all previously approved features, including implementation of COCs to create appropriate baseline views. Visual effects of the project were assessed by comparing these images of the baseline views with simulated images that depict the views as they would appear with addition of the project features now being proposed

3.12.3.2.1 KOP 1 – Dockweiler State Beach

Figure 5.13-2 depicts the views from KOP 1, which is located on Dockweiler State Beach in El Segundo, approximately 0.4 mile northwest of the northern edge of the ESEC site. Figure 5.13-2a is a view of the site under the baseline conditions, depicting Units 5 and 7 in their completed state, along with the sea wall and planting required as Conditions of Certification for Units 5 and 7. The existing Unit 3 and 4 stacks are visible to the right of the Unit 5 and 7 stacks. Figure 5.13-2b is a simulation of the KOP 1 view as it would appear with the modifications to the project site that would occur under the proposed amendment. The Unit 3 and 4 stacks would be removed. In their place, the stacks for proposed Units 11 and 12 would be visible to the immediate right of the Unit 5 and 7 stacks. From this viewpoint, the stack for Unit 9 would be behind the Unit 5 and 7 stacks. Small segments of the Unit 9 and 10 dry cooling tower will be seen extending from behind the left and right sides of the unit 5 and 7 HRSGs and the new air inlet units will be visible to the left of the sea wall, and slightly to the right of the dry cooling tower. In the view from this KOP, the Unit 3 and 4 steam boilers and turbines and associated stacks, would be replaced with lower profile generating units, a stack for Unit 9 that is similar to the Units 5 and 7 stacks, and two thinner and shorter stacks for Units 11 and 12. The effect of the changes that the proposed amendment would bring about would be to reduce the overall mass of the power generation facility on the site and to reduce its overall level of visual contrast with its setting.

3.12.3.2.2 KOP 2 – View from Manhattan Beach

Figure 5.13-3 depicts the view from KOP 2, which is located on Manhattan Beach, approximately 0.1 mile south of the southwestern corner of the ESEC site. Figure 5.13-3a is a view of the site under the baseline conditions, depicting Units 5 and 7 and supporting ESEC structures in their completed state, the sea wall, and the 45th Street Berm and perimeter landscaping as required in the Conditions of Certification. The existing Unit 3 and 4 stacks are visible to the right of the Unit 5 and 7 stacks. Figure 5.13-3b is a simulation of the KOP 2 view as it would appear with the modifications to the project site that would occur under the proposed amendment. The Unit 3 and 4 stacks would be removed. In their place, the stacks for proposed Units 9, 11 and 12 would be visible. The Unit 9 stack is the same height as the Unit 5 and 7 stacks to the north. The Unit 11 and 12 stacks are located to the south of the new Unit 9 stack. Because one of these two stacks is located partially in front of the other in this view, they almost appear to be a single stack. Because these stacks are thinner than the Unit 3 and 4 stacks they replaced, and are separated from the Unit 5 and 7 stacks with an area of sky in between, the set of stacks on the site looks less massive than under baseline conditions. Two of the proposed dry cooling cells are partially visible in the area to the north of the Unit 9 stack. An additional low, rectangular gas compressor station will be partially visible to the left of the gas compressor station in front of Units 9, 11, and 12 that is a part of the baseline condition. A major change in this view will be removal of the Unit 3 and 4 steam boiler units, the large blue and gray assemblages of equipment visible to the right of the Unit 3 and 4 stacks in the baseline image. The effect of the changes brought about by the proposed amendment, particularly the removal of Unit 3 and 4 steam boiler equipment, will be to reduce the overall mass and profile of the power generation facility on the site, reduce the impact on the skyline, and bring about a noticeable reduction in the ESEC's overall level of visual contrast with its setting.

3.12.3.2.3 KOP 3 – View from Manhattan Beach

Figure 5.13-4a depicts the baseline view from KOP 3, which is located along Highland Avenue within a residential neighborhood of Manhattan Beach, approximately 0.1 mile southeast of the southeastern corner of the ESEC site. Units 5 and 7 are visible in their completed state, as well as the planting required as Conditions of Certification for development of Units 5 and 7. The existing Unit 3 and 4 stacks are visible to the left of the Unit 5 and 7 stacks. Figure 5.13-3b is a simulation of the KOP 3 view as it would appear with the modifications to the project site that would occur under the proposed amendment. Unit 3 and 4 stacks would be removed. In their place, the stacks for proposed Units 9, 11 and 12 would be visible. The unit 9 stack is the same height as Unit 5 and 7 stacks to the north. The Unit 11 and 12 stacks are located to the south of the new Unit 9 stack. Because one of these two stacks is located partially in front of the other in this view, they almost appear to be a single stack. A major change in this view will be removal of the Unit 3 and 4 steam boiler units, the large blue and gray assemblages of equipment visible to the right of the Unit 3 and 4 stacks in the baseline image. Removal of this large, bulky equipment will open up the views toward the ocean and the mountains in the distance. In this view, the effect of the changes brought about by the proposed amendment, particularly the removal of the Unit 3 and 4 steam boiler units, would be to reduce the overall mass and profile of the power generation facility on the site, open up the views toward the ocean and mountains behind it, and to bring about a noticeable reduction in the ESEC's overall level of visual contrast with its setting.

3.12.3.2.4 KOP 7 – Dockweiler Beach

Figure 5.13-5 depicts the view from KOP 7, which is located on a jetty along Dockweiler Beach in El Segundo, approximately 0.1 mile west of the northwest corner of the ESEC site. Figure 5.13-5a is a view of the site under the baseline conditions, depicting a corner of the Units 5 and 7 power block in its completed state, along with the sea wall and planting required as Conditions of Certification for development of Units 5 and 7. The existing Unit 3 and 4 stacks are visible in the center of the view, and the Unit 3 and 4 steam boiler units are visible to their left. Figure 5.13-5b is a simulation of the KOP 7 view as it would appear with the modifications to the project site that would occur under the proposed amendment. The Unit 3 and 4 stacks, steam boiler units, and other related equipment would be removed. In their place, the proposed dry cooling tower; stacks for Units 9, 11 and 12; air inlet units; and a new gas compressor station would be visible in the center of the view. In addition, the proposed low, rectangular administration building would be visible up against the bermed area on the right side of the view. In the view from this KOP, with the changes requested by the petition for amendment, the overall mass and profile of the power generation facility on the site would be noticeably reduced, and there would be a reduction in its overall level of visual contrast with its setting.

3.12.3.2.5 KOP 8 – Vista Del Mar

Figure 5.13-6a depicts the baseline view from KOP 8, which is located along Vista Del Mar in El Segundo, approximately 0.2 mile north of the northern edge of the ESEC site. Units 5 and 7 in their completed state are visible to right of the center of the view. The existing Unit 3 and 4 stacks and large, bulky steam boiler units are visible to the left of the Unit 5 and 7 stacks. Figure 5.13-6b is a simulation of the KOP 8 view as it would appear with the modifications to the project site that would occur under the proposed amendment. The Unit 3 and 4 stacks would be removed. In their place, the stacks for proposed Units 9, 11 and 12 would be visible. The Unit 9 stack is visible to the left of the Unit 5 and 7 stacks. The Unit 11 and 12 stacks are located to the left of the new Unit 9 stack. Because one of these two stacks is located partially in front of the other in this view, they almost appear to be a single stack. In addition, in this view, they are difficult to see because they are located behind a H-frame transmission line structure located along the western edge of Vista Del Mar. A major change in this view will be removal of the Unit 3 and 4 steam boiler units. Removal of this large, bulky equipment will reduce the overall mass and profile of the ESEC facility and open up the views from Vista del Mar. In this view, the overall effect of the changes brought about by the proposed amendment would be to open up views and bring about a noticeable reduction in ESEC's overall level of visual contrast with its setting.

3.12.3.2.6 KOP 10 – View from The Strand in Manhattan Beach

Figure 5.13-7a depicts the view from KOP 10, which is located along The Strand at 44th Street in Manhattan Beach, approximately 0.05 mile south of the southern edge of the ESEC site. In the baseline view, the rusty tank has been removed and the landscaping installed in compliance with the ESPRP Conditions of Certification is visible, simulated to indicate its appearance one year after installation. Units 3 and 4 stacks are partially visible. In Figure 3.13-7b, the simulation representing the proposed facility modification outlined in this amendment, the trees and shrubs visible on the berm are those that will be planted in conformance with the Conditions of Certification for development of Units 5 and 7 as they would appear five years after planting. Figure 5.13-7b is a simulation of the KOP 10 view as it would appear with the modifications to the project site that would occur under the proposed amendment. Because of distance and topographic screening, none of the developed power facilities and administrative building proposed in this amendments will be visible. In this view, the overall effect of the changes requested by the amendment would be highly positive.

3.12.3.2.7 Offsite Laydown and Parking Area

This PTA incorporates the same offsite laydown area at 777 W. 190th Street in the City of Gardena that was used in construction of ESEC. The site is relatively flat, paved with asphalt, lighted and includes a perimeter security fence. No site preparation is necessary to use this offsite laydown and parking area. Because the laydown and parking area would be a temporary use during the construction phase of the project, it is not considered a source of any permanent effect to visual resources and is therefore not analyzed in this section.

3.12.3.3 Impact Significance

A discussion regarding whether the visual effects of the project would be significant pursuant to CEQA is provided below. The assessment of these impacts applies the criteria set forth in Appendix G of the CEQA Guidelines. The CEQA Guidelines define a “significant effect” on the environment to mean a “substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project, including objects of historic or aesthetic significance.” (14 CCR 15382) The four questions related to aesthetics that are posed for lead agencies and the answers to them are:

- **Would the project have a substantial adverse effect on a scenic vista?**

  No. Because the overall effect of the changes brought about by the proposed amendment would be generally positive, the amendment will not create adverse effects on a scenic vista.

- **Would the project substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?**

  No. This criterion is not applicable because the ESEC site does not lie within either the right-of-way or viewshed of a state scenic highway.

- **Would the project substantially degrade the existing visual character or quality of the site and its surroundings?**

  No. As the evaluation of the changes to the views from each of the individual KOPs documents, the overall effect of the visual changes that will be brought about by the proposed amendment will be to improve the views of the site.

- **Would the project create a new source of substantial light and glare that would adversely affect day or nighttime views in the area?**

  No. The modifications to the site proposed by the amendment would reduce the amount of night lighting visible within and emanating from the site. At present, the external scaffolding on the Unit 3 and 4 steam boiler units are illuminated by numerous bight bulbs that are readily visible in views from Dockweiler State Beach, Manhattan Beach, Manhattan Beach residential areas, and Vista Del Mar in El Segundo. With removal of the large, bulky combustion units and the bright points of light distributed across their surfaces, the total amount of lighting visible on the ESEC site will be visibly reduced. In addition, all lighting that will be installed on the Units 9, 10, 11, and 12 equipment will conform to Conditions of Certification VIS-7 and VIS-8, which will ensure that project lighting will be the minimal amount required for operations and safety, will be kept off when not in use, and will make use of fixtures that are hooded and directed downward and toward the area where the light is needed to minimize off-site light trespass and impacts on the night sky.

3.12.4 Cumulative Impacts

In its February 2005 decision approving the ESPRP, the Commission determined that:

> "Cumulative impacts to visual resources would occur where project facilities or activities (such as construction) occupy the same field of view as other built facilities or impacted landscapes. It is also possible that a cumulative impact could occur if a viewer's perception is that the general visual quality of an area is diminished by the proliferation of visible structures (or construction effects such as disturbed vegetation), even if the new structures are not within the same field of view as the existing structures. The significance of the cumulative impact would depend on the degree to which (1) the viewshed is altered; (2) visual access to scenic resources is impaired; (3) visual quality is diminished; or (4) the project's visual contrast is increased.
>
> In this case, the proposed project would minimally alter the viewshed. The most significant changes are enhancements: reduction in stack height, perimeter landscaping and fuel oil tank removal combined with a landscaped berm. Therefore, the cumulative visual effects of project structures on the view shed would not be significant. (California Energy Commission. 2005., p. 180)".

The 2010 decision approving the amendment to the project determined that "…the proposed amendment would not result in a significant adverse visual impact". The decision also found that, "The existing and proposed tree and shrub plantings around the project site will reduce the chiller system structure's direct visual impact and contribution to cumulative visual impact to a less than significant level." (California Energy Commission, 2010, p. 91.)

Because the changes to the approved ESEC license proposed by this amendment would further enhance the appearance of the site by reducing the mass of development on the site and by opening up views, its visual impacts would be generally positive and like the original ESPRP and ESEC Decision would not contribute to cumulative visual impacts to the ESEC site's viewshed.

3.12.5 Laws, Ordinances, Regulations and Standards

The modifications proposed in this PTA are consistent with all applicable LORS. The LORS applicable to visual resources have not changed in the time since the 2010 Dry-Cooling PTA was certified by CEC. Proposed activities described in this PTA do not substantially differ from previously proposed activities in a way that would require additional, pre-existing LORS to apply to the project.

3.12.6 Conditions of Certification

Proposed changes to the visual resources conditions of certification are provided below using strikethrough (~~text~~) to show text proposed for deletion and underlining (<u>text</u>) to show text proposed to be added. New condition, VIS-10 is proposed in its entirety.

Several conditions require slight adjustment to facilitate the proposed changes to the facility and ensure that ESEC continues to enhance and complement the community aesthetically. Vis-10 is proposed to ensure that the onsite landscaping changes required for the proposed changes to ESEC do not adversely affect the visual treatment provided for in the project. The proposed changes to the visual conditions of certification are:

- **VIS-1:** Facility Visual Enhancement Plan – ***No changes***
- **VIS-2:** Perimeter Screening and On-site landscaping – ***No change***
- **VIS-3:** Design Treatment of Seawall – ***No change***
- **VIS-4: No longer in decision**.
- **VIS-5:** Structure Surface Painting – ***Proposed change***
- **VIS-6:** Project Lighting – ***Proposed change***
- **VIS-7:** Site Lighting – ***No change***
- **VIS-8:** Construction Lighting – ***Proposed change***
- **VIS-9:** Temporary Landscaping and 45th Street Berm – ***No change***
- **Vis-10:** Landscaping Changes- ***New proposed condition***

The rationale for the proposed changes to the conditions of certification was provided in Section 3.12.2.1, above.

VIS-1: Facility Visual Enhancement Plan. Before starting construction, the project owner shall complete a comprehensive visual enhancement plan that includes landscaping, painting, lighting, and other measures that result in an overall enhancement of views of the facility from areas accessible to the public. The plan shall be made available for review and comment by the Executive Director of the Coastal Commission and for review and approval by the Energy Commission. The plan shall include:

- Landscaping: Where used to screen the facility, vegetation shall be selected and maintained to provide year-round screening (e.g., evergreen species). Preference shall be given to native species and/or species requiring little or no irrigation, or at a minimum, non-invasive species. To help native plant species succeed where efforts are made to establish them, non-native and aggressive ice plant should be removed to prevent it from out competing native dune vegetation due to its dense character and vigorous growth. Soils shall be tested, amended as needed or replaced to ensure plant survival.
- Other structural screening: Where berms, fencing, or other structural elements are selected as the primary method to screen the facility, the structures shall harmonize with the facility's setting on a public beach. If berms are used, they shall be vegetated and maintained with evergreen, native, and/or species requiring little or no irrigation. If fencing is used, it shall include a non-glare finish and be painted in a neutral color.

The Facility Visual Enhancement Plan shall include photographs showing existing conditions and simulated post-construction conditions from Key Observation Points (KOPs) around the facility (these may be the same KOPs that were used to develop the Staff Assessment). The plan shall also include anticipated costs for completing and maintaining the various visual enhancement measures and a detailed schedule for completing construction of these components.

Seawall Design Plan: Before starting construction, the project owner shall complete a plan of the seawall design for review and comment by the Executive Director of the Coastal Commission, the City of Manhattan Beach, and the City of El Segundo, and review and approval by the CPM. This plan shall include:

- Final design: The seawall along the west side of the facility shall be textured and finished in a neutral color harmonious with its location adjacent to a public bike path and beach. If painted, graffiti-resistant paint shall be used.
- Landscaping: Where used to enhance the seawall design, vegetation chosen shall be selected or maintained to provide year-round screening (e.g., evergreen species). Preference shall be given to native species and/or species requiring little or no irrigation.

This seawall design plan shall include photographs showing the existing conditions and simulated post-construction conditions from observation points along the bike path adjacent to the seawall, from the beach, and from other points where the seawall is highly visible. The plan shall also include anticipated costs for completing and maintaining the seawall and a schedule for construction.

Verification: At least 120 days prior to ground disturbance, the project owner shall submit the required Facility Visual Enhancement Plan and Seawall Design Plan to the Executive Director of the Coastal Commission and the Cities of Manhattan Beach and El Segundo for comment, and to the CPM for review and approval. If the CPM notifies the project owner that revisions of the submittal are needed before the CPM will approve the submittal, the project owner shall prepare and submit to the Coastal Commission staff, the Cities, and CPM a revised submittal.

VIS-2 Perimeter screening and on-site landscaping: The project owner shall prepare and implement an approved perimeter screening and on-site landscape plan.

Trees and landscaping along the eastern edge of the project site shall be designed to balance view corridors to the ocean with screening of the facility. The landscape plan shall be provided to the CPM for review and approval, and to the Executive Director of the California Coastal Commission, the City of El Segundo and the City of Manhattan Beach for review and comment. The CPM will consider timely comments from these parties, especially those regarding the balance struck in the landscape plan between view corridor preservation and screening of project components, in determining whether to approve the plan.

The project owner shall establish a Landscape Committee to develop the final landscape plan that will be submitted to the CPM for review and approval, and other parties for review and comment. The Landscape Committee will be comprised of two voting members from the City of El Segundo, two voting members from the City of Manhattan Beach, and two members (one vote) representing the project owner. Energy Commission and Coastal Commission staff will participate on the Committee in an advisory role. The project owner shall submit to the CPM for review and approval a detailed schedule for the Landscape Committee meetings that will ensure that the final landscape plan is provided to the CPM in accordance with the timeline established in the condition.

The screening shall, at a minimum, utilize landscape opportunities on all four boundaries of the project site. Landscape screening shall include: (a) continuous tree canopies on the eastern roadside perimeter to enhance visual unity of the Vista del Mar road corridor, compatibility of the ~~ESPRP~~ project with its coastal setting, and at least partial long-term screening of upper portions of the HRSGs; (b) tree and shrub plantings along Vista del Mar to screen views of the structures, while preserving view corridors to the Bay; (c) plantings along 45th Street to provide long-term screening of the tank farm site; and (d) tree planting on the western site perimeter to screen upper planting on the path (west) side of all new concrete walls constructed along the existing bike path. The plan shall comply with City of El Segundo Zoning codes (Title 15, Chapter 2, Sec. 15-2-14) pertaining to on-site landscaping. The final landscape plan shall reflect the agreed upon removal of existing urea tanks on the west side of the project site.

Final plant selection shall be made in consultation with the Compliance Project Manager (CPM), Coastal Commission staff, and the Cities of Manhattan Beach and El Segundo. Suitable irrigation shall be installed to ensure survival and desired rate of growth. The landscape screening and irrigation system shall be monitored for a period of five years to ensure survival. During this period all dead plant material shall be replaced.

To achieve year-round screening, evergreen species shall be used. Spacing of trees shall be sufficiently dense to ensure substantial screening by the tree canopy at maturity.

Prior to the start of construction, the project owner shall submit a landscape plan to the representatives of California Exotic Pest Plant Council, The Executive Director of the California Coastal Commission and the Cities of Manhattan Beach and El Segundo for review and comment, and to the CPM for review and approval. The plan shall include, but not be limited to:

1. A detailed landscape, grading, and irrigation plan, at a reasonable scale, which includes a list of proposed tree, plant, and shrub species and installation sizes, and a discussion of both the suitability of the plants for the site conditions and mitigation objectives, and conformance with the specific provisions of the Coastal Commission decision, including its 1b and 2b specifying preference for native, non-invasive, and drought tolerant species. A list of potential plant species that would be both viable and non-invasive in this location shall be prepared by a qualified professional landscape architect familiar with local growing conditions, with the objective of providing the widest possible range of species from which to choose. The final planting plan shall include an all inclusive list of plants to be used in order to ensure exclusion of potentially invasive species.
2. A demonstration of how the screening conditions shall be met, including:
    a) Evidence provided by a qualified landscape architect that the specified species are both viable and available;
    b) Graphic documentation on the plan and through digital photo simulations of Bay view corridors and power plant screening which would exist from Vista del Mar and the residential area east of Highland that has views of the project site after project construction; and
    c) A description of tall and short shrub planting zones along Vista del Mar, such that screening of the existing and proposed power plants is maximized, while the aforementioned Bay view corridors are retained.

3. Elevation views or visual simulations of the landscape screening at maturity, in order to show the extent of screening that the landscaping is expected to achieve from the west side of the project, from 45th Street and from Vista del Mar.
4. A detailed schedule for completion of the installation.
5. Maintenance procedures for the entire project site, including any needed irrigation and a plan for routine and regular debris removal as needed to preserve a neat and well-maintained appearance, for the life of the project.
6. A procedure for monitoring and replacement of all unsuccessful plantings for the life of the project.
7. A chart and key plan showing conformance with City of El Segundo landscape regulations.
8. Soil tests shall be performed on both on-site and imported soil where landscaping is to take place. Soil shall be amended on the basis of those tests if needed to ensure long-term viability of plantings.

The property owner shall meet the City of El Segundo's requirements for Vehicle Use Area (VUA) landscaping in the tank farm area by providing the required trees on the existing containment berm and other areas immediately adjacent to the portion of the tank farm area to be used for paved staging, not including the area to be striped for vehicle parking.

The Landscape Plan shall be consistent with the Landscape Concept Plan presented at Evidentiary Hearings, with modifications for VUA landscaping, revisions to depict the 45th Street landscape berm, and modifications to accord with item #2, above.

The project owner shall not implement the plan until the project owner receives written approval of the plan from the CPM.

Verification: At least 30 days prior to the first scheduled Landscape Committee meeting, the project owner shall submit the Committee schedule to the CPM for review and approval. At least 120 days prior to ground disturbance, the project owner shall submit the perimeter screening and onsite landscape plan to the Executive Director of the Coastal Commission and the Cities of Manhattan Beach and El Segundo for comment, and the CPM for review and approval. If the CPM notifies the project owner that revisions of the submittal are needed before the CPM will approve the submittal, the project owner shall prepare and submit to the Coastal Commission staff, the Cities, and the CPM a revised submittal.

The project owner shall implement the landscape plan prior to start of commercial operation. The project owner shall notify the CPM within seven days after completing installation of the landscape plan that the planting and irrigation system are ready for inspection.

The project owner shall report landscape maintenance activities, including replacement of dead vegetation, for the previous year of operation in the Annual Compliance Report.

VIS-3 Design treatment of seawall: The project owner shall construct the proposed seawall with architectural design treatment to reduce visual monotony, enhance design quality and interest, and discourage graffiti. Techniques may include pre-cast or cast-inplace texturing, split-faced concrete block, or other methods feasible to produce a textured surface.

Prior to the start of construction, the project owner shall submit a design plan for the seawall, consistent with the Landscape Concept Plan, to the Executive Director of the Coastal Commission and City of El Segundo for review and comment, and to the CPM for review and approval. The treatment plan shall include:

1. Specification, and 11" x 17" color elevations, of the treatment proposed for use on the seawall;
2. A detailed schedule for completion of construction; and,
3. A procedure to ensure proper maintenance, including graffiti removal, for the life of the project.
4. Seawall construction shall not commence until the design plan has been approved by the CPM.

Verification: At least 120 days prior to start of construction, the project owner shall submit the seawall design plan to the Executive Director of the Coastal Commission and City of El Segundo for review and comment and to the CPM for review and approval.

If the CPM notifies the project owner of any revisions that are needed before the CPM will approve the plan, the project owner shall submit a revised plan to the CPM.

Not less than 30 days prior to start of commercial operation, the project owner shall notify the CPM that the seawall is ready for inspection.

The project owner shall provide a status report regarding wall maintenance in the Annual Compliance Report.

~~**VIS-4 Architectural Screening of Power Plant:**~~ [REMOVED FROM SET OF COCs IN 2008; NO LONGER APPLICABLE TO PROJECT]

VIS-5 Structure Surface Painting and Treatment: Prior to the start of commercial operation, the project owner shall paint or treat project structures visible to the public, such that their colors minimize visual intrusion and contrast by blending with the landscape; their surfaces do not create glare; and they are consistent with local laws, ordinances, regulations, and standards.

<u>Prior to the start of commercial operation of Units 9, 10, 11 and 12, the project owner shall paint or treat the structures visible to the public, such that their colors minimize visual intrusion and contrast by blending with the landscape; their surfaces do not create glare; and they are consistent with local laws, ordinances, regulations, and standards.</u>

The project owner shall consult with representatives of the Cities of El Segundo and Manhattan Beach to determine if specific treatment or painting options that may improve the aesthetic appearance of the project are desired, and provide a report to the CPM.

Prior to the start of construction <u>of the new Units</u>, the project owner shall submit to the Executive Director of the Coastal Commission and the Cities of El Segundo and Manhattan Beach for review and comment, and to the CPM for review and approval, a specific treatment plan whose proper implementation will satisfy these requirements. The treatment plan shall include:

a) Specification, and 11” x 17” color simulations at life size scale, of the treatment proposed for use on project structures, including structures treated during manufacture;

b) A list of each major project structure, building, tank, transmission line tower and/or pole, and fencing/walls specifying the color(s) and finish proposed for each (colors must be identified by name and by vendor brand or a universal designation);

c) Two sets of brochures and/or color chips for each proposed color;

d) Samples of each proposed treatment and color on each material to which they would be applied that would be visible to the public;

e) A detailed schedule for completion of the treatment; and

f) A procedure to ensure proper treatment maintenance for the life of the project.

The project owner shall not specify to the vendors the treatment of any buildings or structures treated during manufacture, or perform the final treatment on any buildings or structures treated on-site, until the project owner receives notification of approval of the treatment plan by the CPM.

Verification: The project owner shall submit its proposed treatment plan at least 90 (ninety) days prior to ordering the first structures that are color treated during manufacture.

If revisions are required, the project owner shall provide the CPM with a revised plan within 30 (thirty) days of receiving notification that revisions are needed.

Prior to commercial operation, the project owner shall notify the CPM that all buildings and structures are ready for inspection.

The project owner shall provide a status report regarding treatment maintenance in the Annual Compliance Report.

VIS-6 Project Lighting: Prior to the start of commercial operation, the project owner shall design and install new permanent lighting for new generating units ~~Units 5, 6, 7 and 8~~, such that light bulbs and reflectors are not visible from public viewing areas; lighting does not cause reflected glare; and illumination of the project, the vicinity, and the nighttime sky is minimized.

To meet these requirements the project owner shall ensure that:

a) Lighting shall be designed so exterior light fixtures are hooded, with lights directed downward or toward the area to be illuminated and so that backscatter to the nighttime sky is minimized. The design of the lighting shall be such that the luminescence or light source is shielded to prevent light trespass outside the project boundary;

b) All lighting shall be of minimum necessary brightness consistent with worker safety;

c) Wherever feasible and safe, lighting shall be kept off when not in use; and

d) A lighting complaint resolution form shall be used by plant operations to record all lighting complaints received and document the resolution of those complaints. All records of lighting complaints shall be kept in the on-site compliance file.

Verification: At least 60 days prior to ordering any permanent exterior lighting, the project owner shall submit to the CPM for review and comment written documentation describing the lighting control measures and fixtures, hoods, shields proposed for use, and incorporate the CPM's comments in lighting equipment orders.

Prior to the first turbine roll, the project owner shall notify the CPM that the lighting has been completed and is ready for inspection. If the CPM notifies the project owner that modifications to the lighting are needed to minimize impacts, within 30 days of receiving that notification the project owner shall implement the modifications and notify the CPM that the modifications have been completed.

The project owner shall report any lighting complaints and documentation of resolution in the Annual Compliance Report, accompanied by any lighting complaint resolution forms or that year.

VIS-7 Site Lighting: Prior to demolition of existing storage tanks, the project owner shall modify the ~~Unit 3 and 4~~ new generating units permanent lighting, such that light bulbs and reflectors are not visible from public viewing areas; lighting does not cause reflected glare; and illumination of the project, the vicinity, and the nighttime sky is minimized. To meet these requirements the project owner shall ensure that:

a) Lighting shall be designed so exterior light fixtures are hooded, with lights directed downward or toward the area to be illuminated and so that backscatter to the nighttime sky is minimized. The design of the lighting shall be such that the luminescence or light source is shielded to prevent light trespass outside the project boundary;

b) All lighting shall be of minimum necessary brightness consistent with worker safety;

c) The project owner shall implement where feasible and practical modifications of circuits in order to allow turning off specific lights when not in use; and

d) A lighting complaint resolution form shall be used by plant operations to record all lighting complaints received and document the resolution of those complaints. All records of lighting complaints shall be kept in the on-site compliance file.

Verification: At least 60 days prior to ordering of any new permanent exterior lighting for the new generating units ~~Units 3 and 4~~, the project owner shall submit to the CPM for review and comment written documentation describing the lighting control measures and fixtures, hoods, shields proposed for use, and incorporate the CPM's comments in lighting equipment orders.

Prior to demolition of the tanks, the project owner shall notify the CPM that the lighting modifications to Unit 3 and 4 have been completed and are ready for inspection. If the PM notifies the project owner that modifications to the lighting are needed to minimize impacts, within 30 days of receiving that notification the project owner shall implement the modifications and notify the CPM that the modifications have been completed.

The project owner shall report any complaints about permanent lighting and provide documentation of resolution in the Annual Compliance Report, accompanied by any lighting complaint resolution forms for that year.

VIS-8 Construction Lighting: Prior to site mobilization, the project owner shall ensure that lighting for construction of the power plant is used in a manner that minimizes potential night lighting impacts, as follows:

a) All lighting shall be of minimum necessary brightness consistent with worker safety.

b) All fixed position lighting shall be shielded, hooded, and directed downward to minimize backscatter to the night sky and prevent light trespass (direct lighting extending outside the boundaries of the construction area).

c) Wherever feasible and safe, lighting shall be kept off when not in use and motion detectors shall be employed.

d) A lighting complaint resolution form shall be maintained by plant construction management, to record all lighting complaints received and to document the resolution of that complaint.

e) All construction-related lighting shall be completely shielded or screened so as not to be visible to residents of 45th Street in Manhattan Beach. Construction lighting in the tank farm area shall be limited to the hours of 7:30 a.m. to 6:00 p.m. Monday through Friday and 9:00 a.m. to 6:00 p.m. Saturday, except as necessary for safety or security purposes.

Verification: Within seven days after the first use of construction lighting, the project owner shall notify the City of Manhattan Beach and the CPM that the lighting is ready for inspection.

If the CPM notifies the project owner that modifications to the lighting are needed to minimize impacts, within 15 days of receiving that notification the project owner shall implement the necessary modifications and notify the CPM that the modifications have been completed.

The project owner shall report any lighting complaints and documentation of resolution in the Monthly Compliance Report, accompanied by any lighting complaint resolution forms for that month.

VIS-9 Temporary Landscaping and 45th Street Berm: Temporary landscaping and 45th Street Berm. Temporary landscaping shall be installed prior to the start of ground disturbing activities at the site in those opportunity areas that do not create a hindrance to construction activities. Soils shall be tested, amended as needed or replaced to ensure plant survival. Temporary landscaping shall be maintained for the duration of construction, and shall be designed to the extent feasible to be retained permanently as part of the perimeter landscaping plan required in Condition of Certification VIS-2. Installation of the 45th Street berm shall be initiated concurrent with construction of the new tank farm access road.

Prior to start of ground disturbance, the project owner shall submit a temporary perimeter landscape plan and final berm plan to the Cities of Manhattan Beach and El Segundo and the Executive Director of the Coastal Commission for review and comment, and to the CPM for review and approval. The plans shall include, but not be limited to:

a) A detailed landscape, grading and irrigation plan, at a reasonable scale, which includes an all-inclusive list of proposed tree, plant, and shrub species and installation sizes, and a discussion of the suitability of the plants for the site conditions and mitigation objectives. A list of potential plant species that would be viable and non-invasive in this location shall be prepared by a qualified professional landscape architect familiar with local growing conditions, with the objective of providing the widest possible range of species from which to choose. The plan shall demonstrate how the screening shall be met, including:

b) Elevation views or visual simulations of the landscape screening at one year's growth in order to show the extent of screening that the landscaping is expected to achieve from the west side of the project, 45th Street and from Vista del Mar.

c) A detailed schedule for completion of the installation.

d) Maintenance procedures for the entire project site, including any needed irrigation and a plan for routine and regular debris removal as needed to preserve a neat and well-maintained appearance, for the life of the project; and

e) A procedure for monitoring and replacement of unsuccessful plantings.

The project owner shall not implement the plan until the project owner receives written approval from the CPM

Verification: At least 60 days prior to start of ground disturbance, the project owner shall submit the temporary perimeter landscape plan and final berm plan to representatives of California Exotic Pest Plant Council, the Executive Director of the Coastal Commission and Cities of Manhattan Beach and El Segundo for comment, and to the CPM for review and approval. If the CPM notifies the project owner that revisions of the submittal are needed before the CPM will approve the submittal, the project owner shall prepare and submit to the CPM a revised plan.

The project owner shall notify the CPM within seven days after completing installation of the 45th Street berm that the berm is ready for inspection. The project owner shall notify the CPM within seven days after completing installation of the temporary landscape screening that the planting and irrigation system are ready for inspection.

The project owner shall report landscape maintenance activities, including replacement of dead vegetation, for the previous month of construction in the Monthly Compliance Report.

VIS-10 Updated Facility Visual Enhancement Plan: Before starting construction of the ESPFM changes, the project owner shall update the Facility Visual Enhancement Plan originally prepared under condition of certification VIS-1. The update shall be made available for review and comment by the Executive Director of the Coastal Commission, the City of Manhattan Beach, the City of El Segundo and then be approved by the Compliance Project Manager.

The update shall include any changes to the landscaping, painting, lighting, and other measures provided for in the original Facility Visual Enhancement Plan as further specified below:

- **Landscaping:** The landscaping that was put in place under the ESEC shall be evaluated, and an identification made of ways it can be supplemented, if appropriate to provide additional screening of sensitive views toward the changed areas of the facility. To the extent that additional plantings should be found to be appropriate and effective in screening sensitive views of the changed facilities, the vegetation specified shall be selected and maintained to provide year-round screening (e.g., evergreen species). Preference shall be given to native species and/or species requiring little or no irrigation, or at a minimum, non-invasive species. To help native plant species succeed where efforts are made to establish them, non-native and aggressive ice plant should be removed to prevent it from out competing native dune vegetation due to its dense character and vigorous growth. Soils shall be tested, amended as needed or replaced to ensure plant survival.

- **Other structural screening:** The berms, fencing, or other structural elements implemented to screen the ESEC shall be evaluated, and an identification made of any areas where it would be appropriate to supplement them to provide additional screening of sensitive views toward the changed facilities. To the extent that additional structural screening should be found to be appropriate the structures shall harmonize with the facility's setting on a public beach. If any additional berms are found to be appropriate, they shall be vegetated and maintained with evergreen, native, and/or species requiring little or no irrigation. If fencing is used, it shall include a non-glare finish and be painted in a neutral color.

Verification: At least 120 days prior to ground disturbance, the project owner shall submit the required Updated Facility Visual Enhancement Plan to the Executive Director of the Coastal Commission and the Cities of Manhattan

Beach and El Segundo for comment, and to the CPM for review and approval. If the CPM notifies the project owner that revisions of the submittal are needed before the CPM will approve the submittal, the project owner shall prepare and submit to the Coastal Commission staff, the Cities, and CPM a revised submittal.

3.12.7 References Cited or Consulted

California Department of Transportation. 2009. California Scenic Highway Program. http://www.dot.ca.gov/hq/LandArch/scenic_highways/scenic_hwy.htm

California Energy Commission. 2005. Commission Decision. El Segundo Power Redevelopment Project, Application for Certification (00-AFC-14) Los Angeles County, California. CEC-800-2005-001-CMF.

California Energy Commission. 2010. Commission Decision to the Amendment. El Segundo Power Redevelopment Project. CEC-800-2010-015.

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


E EL SEGUNDO BLVD
DEL MAR BLVD
KOP 8
Chevron El Segundo Refinery
egundo
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45TH ST
44TH ST
KOP 3
KOP 10
KOP 2
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OCEAN DR
THE STRAND
HIGHLAND AVE
ROSECRANS AVE
Aerial
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ew looking south-southeast toward ESGS from Dockweiler Beach State Park in El Segundo. ESGS is visible in the center of the view, and Manhattan Beach is visible e south of ESGS. Landscaping required as part of existing COCs for 00-AFC-14 is shown as it would appear 1 year after installation.

ew looking north toward ESGS from Manhattan Beach State Park in Manhattan Beach. ESGS is visible in the center of the view. Landscaping required as part of existing s for 00-AFC-14 is shown as it would appear 1 year after installation and is concentrated along the southern and southwestern edge of the project site.

ew to the north-northwest toward ESGS from Highland Avenue, in Manhattan Beach. ESGS is visible in the center of this view from within a residential portion of hattan Beach near 43rd Street. Landscaping required as part of existing COCs for 00-AFC-14 is shown as it would appear 1 year after installation.

A. View to the southeast toward ESGS from a jetty
Dockweiler Beach in El Segundo. The southern an
of ESGS are visible in this view, with the Chevron
Refinery and City of Manhattan Beach visible as b
Landscaping required as part of existing COCs for
shown as it would appear 1 year after installation.

B. View from KOP 7 showing ESPFM. Landscapin
would appear 5 years after installation.

FIG

ew looking south-southeast toward ESGS from Vista Del Mar in El Segundo. El Segundo Energy Center is visible in the center of the view from the roadway that
es along the eastern edge of the ESEC site. Landscaping required as part of existing COCs for 00-AFC-14 is shown as it would appear 1 year after installation.

ew looking north toward ESGS from The Strand, near 44th Street, in Manhattan Beach. Views toward the center of ESGS are mostly obstructed by the 45th Street and landscaping required as part of existing COCs for 00-AFC-14, shown as it would appear 1 year after installation.

3.13 Waste Management

This section describes and evaluates potential effects the proposed ESPFM may have on waste management since the CEC Final Decision in 2005 and the subsequent PTAs. Compliance with applicable LORS is also addressed.

3.13.1 Amendment Overview

As discussed in detail in Section 2.0, Project Description, this PTA proposes modifications to the ESEC that necessitate evaluation of environmental impacts and potential amendments to existing COCs. The proposed PTA is for decommissioning, demolishing, and replacing the existing Units 3 and 4 steam boiler plants with approximately 449 MW gross / 435 MW net of new natural-gas-fired electrical generating capacity, consisting of one combined-cycle train and two simple-cycle gas turbines. The air-cooled, combined-cycle train (CC Fast) will consist of a GTG (Unit 9), a an HRSG, and one STG (Unit 10), rated at 325 MW net. The simple cycle turbines (Units 11 and 12) will consist of two air-cooled Trent 60 ISE advanced aeroderivative gas turbines, each rated at 55 MW net / 58 MW gross. The GE turbine will be supported by a small (36 MMBtu/hr) auxiliary boiler that will be incorporated into the operation of the CC Fast. Removal of existing Units 3 and 4 will eliminate the remaining once-through ocean water cooling system at the ESGS site. The ESPFM will improve electricity generation by adding fast-start and dispatch flexibility capability to support southern California grid load balancing. Total site capacity (including the new equipment previously permitted) will not exceed 1,020 MW net—the rated capacity of previously retired Units 1 and 2, plus the capacity of the soon-to-be-retired Unit 3 and operating Unit 4, which will also be retired as part of the ESPFM.

3.13.2 Affected Environment

3.13.2.1 ESEC Amendments

The proposed ESPFM will result in modifications to the ESEC license (00-AFC-14C). Decommissioning, demolishing, and removing existing Units 3 and 4 and replacing them with new Units 9, 10, 11, and 12 will not result in new waste management impacts beyond those identified in the CEC's amended license for 00-AFC-14 and as described in Section 2.0. It is anticipated that demolition of Units 3 and 4 will generate similar types and quantities of waste as was generated during the demolition of Units 1 and 2. The waste management procedures are subject to the approved COCs WASTE- 1 through WASTE-8, which are adequate to handle the potential ESPFM waste management storage and disposal impacts. The following is a brief description of the waste management existing COCs:

- **WASTE-1** Generator Identification Number
- **WASTE -2** Waste Management Enforcement Action
- **WASTE-4** Registered Professional Engineer/Geologist
- **WASTE -5** Contaminated Soil Excavation
- **WASTE -6** Remedial Investigation Workplan
- **WASTE -7** Runoff Containment
- **WASTE -8** Hazardous Waste Survey

ESEC LLC) has implemented standard operating procedures that require that the existing waste management procedures be maintained to handle ESPFM requirements. As such, the project owner will continue to comply with the requirements set forth in these COCs and will provide updates regarding any changes in onsite waste storage and offsite delivery schedules, as necessary.

3.13.3 Environmental Analysis

As discussed in Section 2.8, Hazardous Materials Management, and consistent with the demolition, construction and future ESEC operating conditions at the ESGS site, the demolition and removal of Units 3 and 4 and the installation and operation of new Units 9, 10, 11, and 12 will result in similar amounts of excavation and truck trips associated with offsite disposal as well as similar construction and operation waste management requirements. Tables 2.8-1 through 2.8-4 list the types and amounts of wastes generated by construction, demolition, and operation of the ESEC and construction and operation of the ESPFM is expected to generate similar types and amounts of solid waste. The storage and disposal of these waste products will be conducted in accordance with all applicable LORS and existing COCs. In addition, the removal of Units 3 and 4 and subsequent discontinuation of the once-through cooling system will eliminate the need to dispose of the waste products associated with the by-products generated from the cooling water process. Therefore, it is expected the operation of the ESPFM will result in similar waste generation, storage, and disposal needs. Waste management will continue to be mitigated by conformance with the requirements of COCs WASTE-1 through WASTE-8.

3.13.3.1 Offsite Construction Laydown and Construction Worker Parking Areas

The preferred offsite laydown area, located at 777 W. 190th Street in the City of Gardena, was incorporated into ESEC in the 2010 PTA decision and will continue to be used for ESPFM. Construction laydown and parking areas will also be established within the ESGS site boundary, as well as at offsite areas identified in the CEC Final Decision and shown on Figure 2-10. The 190th Street area is less than ten miles southeast of the ESGS and is easily accessible to the I-405 and I-110 North freeways from Vermont Avenue and 190th Street as well as to ESEC-approved traffic/truck routes. This site, zoned M2, commercial, has approximately ten usable acres and includes a 5,500 square-foot industrial building. The approximately 12.1-acre site paved with asphalt has nightlighting and includes a perimeter security fence. No site preparation other than minor clean-up is required prior to use. During the construction phase, the types of wastes that may be used or encountered at the construction laydown areas are expected to be limited to inert trash and debris. The existing COCs ensure that construction-related activities conducted at the laydown areas will comply with appropriate waste management procedures and plans.

3.13.4 Cumulative Impacts

The proposed ESPFM covered under this PTA will result in similar waste management impacts for the demolition of Units 3 and 4 and construction of Units 9 through 12 as the demolition of Units 1 and 2 and construction of Units 5 through 8 and, therefore, will not result in any significant cumulative impacts associated with the generation or disposal of wastes beyond those addressed in the CEC Final Decision for 00-AFC-14.

3.13.5 Laws, Ordinances, Regulations and Standards

The CEC Final Decision found the project to be in compliance with all applicable waste LORS. As described in this PTA, the proposed ESPFM is consistent with applicable waste management-related LORS and the Amendment will not alter the assumptions or conclusions in the CEC Final Decision for 00-AFC-14 and no additional or revised LORS compliance requirements have been identified.

3.13.6 Conditions of Certification

ESEC LLC's standard operating procedures require that all waste products be disposed consistent with COCs. As such, it will continue to comply with the requirements set forth in these COCs and will document the location and amounts of waste generated and disposed offsite. Previously approved COCs for Waste Management are sufficient in addressing waste storage and disposal requirements. Existing COCs WASTE-1 through WASTE-8 are adequate to address ESPFM without being amended, with the exception of the minor changes below that focus on the single fuel tank being removed as part of this PTA. These COCs are provided below.

WASTE-1 Waste Generator Identification Number: The project owner and, if necessary, its construction contractor, shall each obtain a hazardous waste generator identification number from the Department of Toxic Substances Control prior to generating any hazardous waste.

Verification: The project owner shall notify the CPM via the monthly compliance report of its receipt and keep a copy of the identification number on file at the project site.

WASTE-3 Waste Management: Upon becoming aware of any impending waste management-related enforcement action by any local, state, or federal authority, the project owner shall notify the CPM of any such action taken or proposed to be taken against the project itself, or against any waste hauler or disposal facility or treatment operator with which the owner contracts.

Verification: The project owner shall notify the CPM in writing within 10 days of becoming aware of an impending enforcement action. The CPM shall notify the project owner of any changes that will be required in the manner in which project-related wastes are managed.

WASTE-3 Waste Management Plan: Prior to the start of both site mobilization and project operation, the project owner shall prepare and submit to the CPM for review and approval, and to local agencies, if applicable, for review and comment, a waste management plan for all wastes generated during construction and operation of the facility, respectively. The plans shall contain, at a minimum, the following:

- A description of all waste streams, including projections of frequency, amounts generated and hazard classifications; and
- Methods of managing each waste, including storage, treatment methods and companies contracted with for treatment services, waste testing methods to assure correct classification, methods of transportation, disposal requirements and sites, and recycling and waste minimization/reduction plans.

Verification: No less than 30 days prior to the start of site mobilization, the project owner shall submit the demolition and construction waste management plan to and to local agencies, if applicable, for review and comment, and the CPM. The operation waste management plan shall be submitted no less than 30 days prior to the start of project operation. The project owner shall submit any required revisions within 20 days of notification by the CPM (or mutually agreed upon date). In the Annual Compliance Reports, the project owner shall document the actual waste management methods used during the year compared to planned management methods.

WASTE-4 Registered Professional Engineer/Geologist: The project owner shall have a Registered Professional Engineer or Geologist, with experience in remedial investigation and feasibility studies, available for consultation during soil excavation and grading activities. The Registered Professional Engineer or Geologist shall be given full authority to oversee any earth moving activities that have the potential to disturb contaminated soil.
Verification: At least 30 days prior to the start of site mobilization, the project owner shall submit the qualifications and experience of the Registered Professional Engineer or Geologist to the CPM for approval.

WASTE-5 Contaminated Soil Excavation: If potentially contaminated soil is unearthed during excavation at either the proposed site or linear facilities as evidenced by discoloration, odor, detection by handheld instruments, or other signs, the Registered Professional Engineer or Geologist shall inspect the site, determine the need for sampling to confirm the nature and extent of contamination, and file a written report to the project owner and CPM stating the recommended course of action. Depending on the nature and extent of contamination, the Registered Professional Engineer or Geologist shall have the authority to temporarily suspend construction activity at that location for the protection of workers or the public. If, in the opinion of the Registered Professional Engineer or Geologist, significant remediation may be required, the project owner shall contact representatives of the Los Angeles Regional Water Quality Control Board, the Glendale Regional Office of the California Department of Toxic Substances Control the CPM, and other local agencies, if applicable, for guidance and possible oversight.

Verification: The project owner shall submit any reports filed by the Registered Professional Engineer or Geologist to the CPM and the City of El Segundo Fire Department within 5 days of their receipt. The project owner shall notify the CPM within 24 hours of any orders issued to halt construction.

WASTE-6 Remedial Investigation Workplan: Before demolition of the existing <u>Units 3 and 4</u> and any other <u>support</u> building <u>or equipment,</u> respectively, the project owner shall prepare a Remedial Investigation Workplan (RI Workplan). This plan shall include a detailed site characterization plan with soil and groundwater sampling and analysis to determine the extent and nature of contamination existing beneath these structures. The RI Workplan shall be provided to the Glendale Regional Office of the California Department of Toxic Substances Control, the Los Angeles Regional Water Quality Control, and the City of El Segundo Fire Department, and other local agencies, if applicable, for review and comment, and to the CEC CPM for review and approval. If contaminated soil or groundwater is found to exist, the project owner shall contact representatives of the above-named agencies for further guidance and possible oversight. In no event shall the project owner proceed with site preparation or construction activities at any location on the site where hazardous waste contamination is found to be present until that location is either remediated or shown to pose an insignificant risk to humans and the environment as demonstrated to the satisfaction of the LARWQCB, DTSC, and the CPM.

Verification: At least sixty (60) days prior to commencement of fuel tank~~s~~ demolition or structure demolition, respectively, the project owner shall provide the RI Workplan to the Glendale Regional Office of the California Department of Toxic Substances Control, the Los Angeles Regional Water Quality Control Board, the City of El Segundo Fire Department, other agencies, if applicable, and the CEC CPM. Within thirty (30) days of completion of the sampling and analysis and prior to the initiation of any construction activities, the project owner shall provide the results of the sampling and analysis to the Glendale Regional Office of the California Department of Toxic Substances Control, the Los Angeles Regional Water Quality Control Board, the City of El Segundo Fire Department, other agencies, if applicable, and the CPM for review and guidance on possible remediation.

WASTE-7 Runoff Containment: Before demolition of the fuel oil tank~~s~~, the existing generator buildings and any other building, the project owner shall ensure that the appropriate portion of the site is surrounded by a berm or other solid structures capable of containing any runoff from that portion of the site and preventing this runoff from leaving the site. In no event shall the project owner proceed with site preparation or construction activities at any location on the site where hazardous waste contamination is found to be present until that location has such containment in place to the satisfaction of the CPM.

Verification: At least thirty (30) days prior to commencement of site preparation activities, the project owner shall provide written plans on containment to the CPM for review and approval.

WASTE-8 Hazardous Waste Survey: Prior to modification or demolition of existing structures, the project owner shall complete and submit a survey of all Asbestos-Containing Materials (ACM) and Regulated Building Materials (RBM) that contain lead-based paint to the El Segundo Fire Department for review and comment and to the CPM for approval. After receiving approval, the project owner shall remove all ACM and RBM from the site prior to demolition.

Verification: No less than sixty (60) days prior to commencement of structure demolition, the project owner shall provide the survey to the El Segundo Fire Department for review and comment, and to the CPM for review and approval. The project owner shall inform the CPM, via the monthly compliance report, of the data when all ACM and RBM were removed from the site.

3.14 Worker Health and Safety

This section describes and evaluates potential effects the proposed changes may have on worker health and safety. Compliance with applicable LORS is also addressed.

3.14.1 Amendment Overview

As discussed in detail in Section 2.0, Project Description, this PTA proposes modifications to the ESEC that necessitate evaluation of environmental impacts and potential amendments to existing COCs. The proposed PTA is for decommissioning, demolishing, and replacing the existing Units 3 and 4 steam boiler plants with approximately 449 MW gross / 435 MW net of new natural-gas-fired electrical generating capacity, consisting of one combined-cycle train and two simple-cycle gas turbines. The air-cooled, combined-cycle train (CC Fast) will consist of a GTG (Unit 9), a an HRSG, and one STG (Unit 10), rated at 325 MW net. The simple cycle turbines (Units 11 and 12) will consist of two air-cooled Trent 60 ISE advanced aeroderivative gas turbines, each rated at 55 MW net / 58 MW gross. The GE turbine will be supported by a small (36 MMBtu/hr) auxiliary boiler that will be incorporated into the operation of the CC Fast. Removal of existing Units 3 and 4 will eliminate the remaining once-through ocean water cooling system at the ESGS site. The ESPFM will improve electricity generation by adding fast-start and dispatch flexibility capability to support southern California grid load balancing. Total site capacity (including the new equipment previously permitted) will not exceed 1,020 MW net—the rated capacity of previously retired Units 1 and 2, plus the capacity of the soon-to-be-retired Unit 3 and operating Unit 4, which will also be retired as part of the ESPFM.

3.14.2 Affected Environment

3.14.2.1 ESEC Amendments

The proposed ESPFM will result in modifications to the ESEC license (00-AFC-14C). Decommissioning, demolishing, and removing existing Units 3 and 4 and replacing them with new Units 9, 10, 11, and 12 will not result in new worker safety impacts above those identified in the CEC's amended license for 00-AFC-14 and as described in Section 2.0. The ESPFM may result in minor changes in hazardous materials storage and use, hazardous waste generation, noise exposure, construction activities, fire protection, and emergency response and are addressed in more detail in each of the specific PTA sections. The Worker Safety and Health Program subject to the approved COCs WORKER SAFETY-1 through WORKER SAFETY-6 is adequate to address the potential impacts of ESPFM. The following is a brief description of the worker safety covered by each existing COC:

WORKER SAFETY-1 Demolition-related plans and programs
WORKER SAFETY-2 Operations and Maintenance Safety Plan
WORKER SAFETY-3 Use of former tank area for storage – ***Proposed deletion***
WORKER SAFETY-4 Construction Safety Supervisor
WORKER SAFETY-5 Chief Building Official (CBO) Payments
WORKER SAFETY-6 Onsite AED

ESEC LLC has implemented standard operating procedures that require that all safety-related plans be maintained to reflect current site and emergency service conditions. As such, the project owner will continue to comply with the requirements set forth in these COCs and will provide updates regarding the location or project components, implementation of onsite safety systems/programs, and emergency response contacts, as necessary.

3.14.3 Environmental Analysis

3.14.3.1 Hazardous Materials Storage and Use

As discussed in Section 3.4, Hazardous Materials Management, and consistent with the current operating conditions at the ESGS, the demolition and removal of Units 3 and 4 and the installation and operation of new Units 9, 10, 11, and 12 will result in minimal changes to the existing aqueous ammonia system as described in Sections 2.3 and 2.8.1. There is a potential for the ESPFM to result in changes in the frequency of aqueous ammonia deliveries; however, system upgrades and changes in operating conditions will not be required. In addition, as described in Section 2.8.1, a variety of chemicals will be stored and used during construction and operation of the facility. Table 2.8.1-5 lists anticipated chemicals. The storage, handling, and use of these chemicals will be conducted in accordance with all applicable LORS and existing COCs. In addition, the removal of Units 3 and 4 and subsequent discontinuation of the once-through cooling system eliminates the need to store and use chlorine for biological growth control. The elimination of chlorine use will result in less potential impacts on worker health and safety. Therefore, implementation of the ESPFM will result in lower potential impacts to worker health and safety associated with hazardous materials storage and use. Worker safety risks associated with hazardous materials storage and use will continue to be mitigated by conformance with the requirements COC WORKER SAFETY-2.

3.14.3.2 Hazardous Wastes Generation and Disposal

As discussed in Section 3.10, Soil and Water Resources, the removal of Units 3 and 4 and subsequent discontinuation of the once-through cooling and subsequent wastewater discharge requiring wastewater byproduct treatment and disposal lowers the amount of hazardous wastes generated. Wastewater generated from chemical cleaning of the HRSGs, combustion turbines, and compressors will continue to be collected and stored in holding tanks, profiled in accordance with the facility’s hazardous waste management program and shipped offsite to a properly permitted facility for treatment and disposal or recycling. Therefore, implementation of the ESPFM will not result in any increase to the existing waste generation and storage and subsequently no increases in potential impacts to worker health and safety that cannot be mitigated by conformance with the requirements included in the Operations and Maintenance Safety and Health Program provided in COC WORKER SAFETY-2.

3.14.3.3 Noise

As discussed in Section 3.7, Noise, consistent with the current operating conditions at the ESGS, the demolition and removal of Units 3 and 4 and the installation and operation of new Units 9, 10, 11, and 12 will not exceed the existing noise generation levels or require additional mitigation to maintain worker safety. The new air-cooled condenser system for ESPFM will be a new source of noise, however, it is anticipated that the operation of Units 9, 10, 11, and 12, will not result in worker exposure to increased noise levels. Worker safety issues associated with noise exposure would be mitigated through conformance with COC NOISE-7 which requires that an occupational noise survey be conducted to identify potential noise hazardous areas and, if necessary, develop additional mitigation measures in consultation with Cal/OSHA to reduce noise levels to prescribed limits.

3.14.3.4 Egress, Access and Worker Exposure to Hazards

The new units subject to this Amendment will occupy a slightly larger footprint than the previously permitted units, but worker access and egress in the production area of the proposed new units is not substantially restricted, as compared with the previous design. A new access road between the power blocks improves worker access as compared with the current power block configuration. The demolition and removal of Units 3 and 4 and the installation and operation of new Units 9, 10, 11, and 12 will result in the net increase of one steam turbine generator. However, this additional component does not substantially increase the risk of worker exposure to an upset event, given the relative similarities in the previously permitted and the proposed generator technology. Worker safety risks will continue to be mitigated by the Operations and Maintenance Safety and Health Program provided for under COC WORKER SAFETY-2.

3.14.3.5 Construction

The location and configuration of the new Units 9, 10, 11, and 12 will require less excavation than the excavation requirements for Units 5 through 8 for which the impacts were addressed in 00-AFC-14. While earthwork may result in worker exposure to contaminated soils, the reduction in the extent and depth of excavation will lower potential worker exposure to contaminated soils and groundwater. Therefore, potential worker safety risks associated with exposure to contaminated soils will continue to be mitigated through the implementation of existing COCs WORKER SAFETY-1 and WASTE-5.

3.14.3.6 Fire Protection

The demolition and removal of Units 3 and 4 and the installation and operation of new Units 9, 10, 11, and 12 will be incorporated into the existing dedicated fire protection equipment and systems operated in accordance with National Fire Protection Association (NFPA) standards and existing COCs. Therefore, potential worker safety fire risks continue to be mitigated through the implementation of existing COCs WORKER SAFETY-1 and WORKER SAFETY-2.

3.14.3.7 Offsite Laydown and Parking Areas

The preferred offsite laydown area, located at 777 W. 190th Street in the City of Gardena, was incorporated into ESEC in the 2010 PTA decision and will continue to be used for ESPFM. Construction laydown and parking areas will also be established within the ESGS site boundary, as well as at offsite areas identified in the CEC Final Decision and shown on Figure 2-10. The 190th Street area is less than ten miles southeast of the ESGS and is easily accessible to the I-405 and I-110 North freeways from Vermont Avenue and 190th Street as well as to ESEC-approved traffic/truck routes. This site, zoned M2, commercial, has approximately ten usable acres and includes a 5,500 square-foot industrial building. The approximately 12.1-acre site paved with asphalt has nightlighting and includes a perimeter security fence. No site preparation other than minor clean-up is required prior to use. Current site conditions do not pose a safety hazard to workers during parking or equipment staging and storage. During construction, workers will be exposed to hazards typical of equipment staging and heavy-haul transportation operations, including exposure to potential hazards such as slip/trip/fall, lacerations, hazardous materials and hazardous wastes, heavy construction equipment and vehicles, fire, noise, and elevated and overhead work. The potential hazards associated with this new laydown area are not different in type or scope than the hazards associated with previously permitted offsite laydown areas. Existing COC WORKER SAFETY-1 will ensure construction related activities conducted at laydown areas comply with all appropriate safety programs and plans. Therefore, implementation of ESPFM will not change impacts to worker health or safety associated with use of the laydown areas and the existing COCs are adequate to address any potential impacts.

3.14.4 Cumulative Impacts

The proposed ESPFM covered under this PTA will not result in any significant cumulative impacts to worker health and safety beyond those addressed in the CEC's Final Decision (00-AFC-14).

3.14.5 Laws, Ordinances, Regulations and Standards

The CEC Final Decision found the project to be in compliance with all applicable LORS. As described in this PTA, the proposed ESPFM is consistent with applicable worker safety-related LORS, and the Amendment will not alter the assumptions or conclusions made in the CEC's Final Commission Decision (Final Decision).

3.14.6 Conditions of Certification

Existing COCs WORKER SAFETY-1 through WORKER SAFETY-6 are adequate to address ESPFM without being amended. These COCs are provided below.

WORKER SAFETY-1: The project owner shall submit to the Compliance Project Manager (CPM) for approval, a copy of the Project Demolition and Construction Safety and Health Program containing the following:

- A Demolition and Construction Safety Program;
- A Demolition and Construction Personal Protective Equipment Program;
- A Demolition and Construction Exposure Monitoring Program;
- A Demolition and Construction Emergency Action Plan; and
- A Demolition and Construction Fire Protection and Prevention Plan.

The Safety Program, the Personal Protective Equipment Program, and the Exposure Monitoring Program shall be submitted to the CPM for review and comment concerning compliance of the program with all applicable Safety Orders. The Demolition and Construction Fire Protection and Prevention Plan and Emergency Action Plan shall be submitted to the City of El Segundo Fire Department for review and comment prior to submittal to the CPM.

The Demolition and Construction Fire Protection and Prevention Plan and Emergency Action Plan shall include the following:

1. Methods to maintain fire access roadways and submittal of a fire access layout plan for review by the El Segundo Fire Department and approval by the CPM.
2. Provision of a suitable replacement for the existing fire suppression water reservoir prior to demolishing the existing reservoir.
3. Provision of fire flow calculations to verify that the available water supply proposed will be adequate for emergency operations.
4. A requirement that all temporary fire mains and hydrants shall be adequately braced and tied-down to anticipate the effects of water hammer and that protection from vehicular impact is provided as necessary.

Verification: At least 30 days prior to site mobilization, the project owner shall submit to the CPM for review and approval a copy of the Project Demolition and Construction Safety and Health Program. The project owner shall provide a letter from the City of El Segundo Fire Department stating that they have reviewed and commented on the Demolition and Construction Fire Protection and Prevention Plan and Emergency Action Plan.

WORKER SAFETY-2: The project owner shall submit to the CPM for approval a copy of the Project Operations and Maintenance Safety and Health Program containing the following:

- An Operation Injury and Illness Prevention Plan;
- An Emergency Action Plan;
- Hazardous Materials Management Program;
- Operations and Maintenance Safety Program;
- Fire Protection and Prevention Program (8 CCR § 3221); and;
- Personal Protective Equipment Program (8 CCR §§ 3401-3411).

The Operation Injury and Illness Prevention Plan, Emergency Action Plan, and Personal Protective Equipment Program shall be submitted to the Cal/OSHA Consultation Service, for review and comment concerning compliance of the program with all applicable Safety Orders. The Operation Fire Protection Plan and the Emergency Action Plan shall also be submitted to the City of El Segundo Fire Department for review and comment.

The Project Operations Fire Protection and Prevention Plan and Emergency Action Plan shall address:

1. Provision of remote annunciation for all fire alarm and automatic suppression devices and the placement of remote annunciation at the security station on Vista Del Mar.
2. Provision of a complete fire alarm system and automatic fire sprinklers for the new administration building and any new control buildings.
3. A secondary entrance point for Fire Department operations along the northern boundary of the property.

Verification: At least 30 days prior to the start of operation, the project owner shall submit to the CPM and the City of El Segundo Fire Department a copy of the Project Operations and Maintenance Safety & Health Program.

~~**WORKER SAFETY-3:** Before using one of the fuel oil storage tanks as a clean soils storage area, the project owner shall ensure that the integrity of the floor has not been compromised by cracks or holes, the tanks have been thoroughly cleaned, no airborne hydrocarbons are present above the method detection level of a hand-held PID hydrocarbon vapor detector, and that the earth-moving vehicles used are equipped with environmental cabs.~~

~~**Verification:** At least 30 days prior to the start of using the tanks as a storage area, the project owner shall submit to the CPM a report verifying the integrity of the floor, describing the results of the PID monitoring, and a statement that all earth-moving vehicles used are equipped with properly functioning environmental cabs.~~

WORKER SAFETY-4 The project owner shall provide a site Construction Safety Supervisor (CSS) who, by way of training and/or experience, is knowledgeable of power plant construction activities and relevant laws, ordinances, regulations, and standards, is capable of identifying workplace hazards relating to the construction activities, and has authority to take appropriate action to assure compliance and mitigate hazards. The CSS shall:

- Have over-all authority for coordination and implementation of all occupational safety and health practices, policies, and programs;
- Assure that the safety program for the project complies with Cal/OSHA & federal regulations related to power plant projects;
- Assure that all construction and commissioning workers and supervisors receive adequate safety training;
- Complete accident and safety-related incident investigations, emergency response reports for injuries, and inform the CPM of safety-related incidents; and
- Assure that all the plans identified in Worker Safety-1 and-2 are implemented.

Verification: At least thirty (30) days prior to the start of project 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-5 The project owner shall make payments to the Chief Building Official (CBO) for the services of a Safety Monitor based upon a reasonable fee schedule to be negotiated between the project owner and the CBO. Those services shall be in addition to other work performed by the CBO. The Safety Monitor shall be selected by and report directly to the CBO, and will be responsible for verifying that the Construction Safety Supervisor, as required in Worker Safety-4, implements all appropriate Cal/OSHA and Commission safety requirements. The Safety Monitor shall conduct on-site (including linear facilities) safety inspections at intervals necessary to fulfill those responsibilities.

Verification: 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-6 The project owner shall ensure that a portable automatic cardiac defibrillator (also known as an automatic external defibrillator or AED) is located on site during 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 thirty (30) days prior to the start of construction mobilization, the project owner shall submit to the CPM proof that a portable automatic cardiac defibrillator exists on site and a copy of the training and maintenance program for review and approval.

SECTION 4.0

Potential Effects on the Public

Consistent with the requirements of the CEC Siting Regulations Section 1769 (a)(1)(G), this section addresses the proposed Amendment's effects on the public.

Impacts to the public are anticipated to be similar or less than those analyzed during the previous license proceeding for the ESEC demolition of Units 1 and 2 and the construction and operation of Units 5 through 8. Implementation of the ESPFM will eliminate once-through cooling from ESGS and will eliminate ESGS's ocean discharge of industrial and sanitary wastewater reducing the amount of wastes to be discharged into the environment.

SECTION 5.0

List of Property Owners

Consistent with the CEC Siting Regulations Section 1769(a)(1)(H), this section lists the property owners affected by the proposed modifications.

TABLE 5-1

Property Owners within 1,000 Feet of the Project

APN	OWNER	Address	City	State	Zip
4138-029-004	EL SEGUNDO POWER LLC	211 CARNEGIE CTR	PRINCETON	NJ	8540
4138-029-800	SO CALIF EDISON CO	2244 WALNUT GROVE AVE #270	ROSEMEAD	CA	91770
4138-029-802	EL SEGUNDO POWER LLC SBE 1110-19-1 PAR 1	PO BOX 4777	HOUSTON	TX	77210
4138-029-803	EL SEGUNDO POWER LLC SBE 1110-19-1 PAR 2	PO BOX 4777	HOUSTON	TX	77210
4137-003-012	SCOTT A FREGO	318 GULL ST	MANHATTAN BEACH	CA	90266
4137-003-013	4116 HIGHLAND AVENUE LLC	1001 6TH ST 150	MANHATTAN BEACH	CA	90266
4137-003-014	4117 CREST LLC	2307 JOHN ST	MANHATTAN BEACH	CA	90266
4137-003-015	LORA LAVERTY	26 E DIVISION ST	CHICAGO	IL	60610
4137-003-016	LINDSAY L DENARDO	317 MOONSTONE ST	MANHATTAN BEACH	CA	90266
4137-003-017	FRANKLIN J JAVIER	4100 HIGHLAND AVE	MANHATTAN BCH	CA	90266
4137-003-018	ROBERTA A & JOHN A BROWN	4108 HIGHLAND AVE	MANHATTAN BEACH	CA	90266
4137-003-019	JENKINS ROBERT T CO TR	471 CROCKER RD	SACRAMENTO	CA	95864
4137-003-020	JACQUELINE BARTON	6200 WILSHIRE BLVD #805	LOS ANGELES	CA	90048
4137-003-024	GRADY T MONTS	120 39TH ST	MANHATTAN BCH	CA	90266
4137-003-025	STOCK WILLIAM H CO TR	4209 CREST DR	MANHATTAN BEACH	CA	90266
4137-003-026	JOSEPH T CLEES	5740 N ECHO CANYON CIR	PHOENIX	AZ	85018
4137-003-027	WILLIAM & ANGELA BARRICK	P.O. BOX 2762	EL SEGUNDO	CA	90245
4137-003-028	HAE S YOUNG	P.O. BOX 3014	REDONDO BEACH	CA	90277
4137-003-029	ALAN MEERSAND	129 4TH ST	MANHATTAN BEACH	CA	90266
4137-004-005	PETER H MEYERS	225 17TH ST	MANHATTAN BEACH	CA	90266
4137-004-006	PETER H MEYERS	225 17TH ST	MANHATTAN BEACH	CA	90266
4137-004-007	WANDA L ATKENSON	4308 CREST DR	MANHATTAN BEACH	CA	90266
4137-004-011	HARRIS RICHARD G CO TR	8235 BILLOWVISTA DR	PLAYA DEL REY	CA	90293
4137-004-012	MARY N FERRERO	P.O. BOX 1283	SOUTH PASADENA	CA	91031

TABLE 5-1

Property Owners within 1,000 Feet of the Project

APN	OWNER	Address	City	State	Zip
4137-004-013	SEAN E RYAN	4416 HIGHLAND AVE	MANHATTAN BEACH	CA	90266
4137-004-014	MARGO OCHS	4408 HIGHLAND AVE	MANHATTAN BEACH	CA	90266
4137-004-018	RYAN STEWART	4407 CREST DR	MANHATTAN BEACH	CA	90266
4137-004-019	LUIS E TEJADA	4401 CREST DR A	MANHATTAN BEACH	CA	90266
4137-004-021	JUDITH M SCHERPENBERG	318 45TH ST	MANHATTAN BEACH	CA	90266
4137-004-022	ANDREW C PHELPS	317 GULL ST	MANHATTAN BEACH	CA	90266
4137-004-024	NATHAN R & CHRISTINA S SCHMIDT	309 GULL ST	MANHATTAN BEACH	CA	90266
4137-004-025	SAND SECTION PROPERTIES LLC	120 36TH ST	MANHATTAN BEACH	CA	90266
4137-004-026	JOHN M TURNER	307 44TH STREET	MANHATTAN BEACH	CA	90266
4137-004-027	LINN STEPHEN CO TR	2616 N POINSETTIA AVE	MANHATTAN BEACH	CA	90266
4137-004-038	SHERRON L SYLVESTER	661 35TH ST	MANHATTAN BCH	CA	90266
4137-004-039	RYAN STEWART	4407 CREST DR	MANHATTAN BEACH	CA	90266
4137-004-043	VERONICA B CUSHMA	P.O. BOX 2773	LA JOLLA	CA	92038
4137-004-044	PATRIC J & JENNIFER MACHA	25906 PORTAFINO DR	MISSION VIEJO	CA	92691
4137-004-045	JAN M MCDONALD TOMLINSON	4216 HIGHLAND AVE #C	MANHATTAN BEACH	CA	90266
4137-004-046	CHARLES W RALSTON	4216 HIGHLAND AVE #D	MANHATTAN BEACH	CA	90266
4137-004-047	RENEE M CROCE	4216 HIGHLAND AVE #E	MANHATTAN BCH	CA	90266
4137-004-048	ROBERT A & ELENA J CECCONI	4217 HIGHLAND AVE #F	MANHATTAN BCH	CA	90266
4137-004-049	PETER CHAMBLISS	4216 HIGHLAND AVE #G	MANHATTAN BEACH	CA	90266
4137-004-050	RICHARD W WINZELER	4216 HIGHLAND AVE #H	MANHATTAN BEACH	CA	90266
4137-004-051	ROBERTO C MEDRANO	P.O. BOX 487	MANHATTAN BEACH	CA	90267
4137-004-052	DAVIS JEFFREY A CO TR	820 MANHATTAN AVE #205	MANHATTAN BCH	CA	90266
4137-004-053	ADAM J FEELEY	477 ZUNI DR	DEL MAR	CA	92014
4137-004-054	JERALD D COLMERY	4307 CREST DR	MANHATTAN BEACH	CA	90266

TABLE 5-1
Property Owners within 1,000 Feet of the Project

APN	OWNER	Address	City	State	Zip
4137-004-056	RICHARD G NICKELSON	4421 CREST DR	MANHATTAN BCH	CA	90266
4137-004-057	JEFFREY M & MOMOKO N BUTTERWORTH	4419 CREST DR	MANHATTAN BEACH	CA	90266
4137-004-059	MILLENNIUM RECORDS INC	P.O. BOX 80533	SAN MARINO	CA	91118
4137-004-060	STEVEN MARIN	316 45TH ST	MANHATTAN BEACH	CA	90266
4137-004-065	SCOTT A FREGO	318 GULL ST	MANHATTAN BEACH	CA	90266
4137-004-066	ALEN TERNIAN	308 GULL ST	MANHATTAN BEACH	CA	90266
4137-004-067	ANDREW & KRISTIN LELCHUK	4321 CREST DR	MANHATTAN BEACH	CA	90266
4137-004-068	LEONARDO N RODRIGUEZ	4323 CREST DR	MANHATTAN BEACH	CA	90266
4137-004-069	SUN MOON KIM	4320 HIGHLAND AVE	MANHATTAN BEACH	CA	90266
4137-004-070	SHELLY & JAIME S SCHWARTZ	312 44TH ST	MANHATTAN BEACH	CA	90266
4137-004-071	ARTHUR J COHEN	316 44TH ST	MANHATTAN BEACH	CA	90266
4137-005-008	HANY & MARY H BEKHIT	4419 HIGHLAND AVE	MANHATTAN BEACH	CA	90266
4137-005-009	CYNTHIA ZACKO	223 GULL ST	MANHATTAN BEACH	CA	90266
4137-005-010	CLAY & LEE M CLAUDINO	P.O. BOX 3457	MANHATTAN BEACH	CA	90266
4137-005-011	JAMES A & MARIA T SNYDER	1001 6TH ST #150	MANHATTAN BEACH	CA	90266
4137-005-012	JARYL W CRAMTON	3801 E HIGHWAY 66	KINGMAN	AZ	86401
4137-005-013	ROSSO JOHN A CO TR	7509 W 89TH ST	LOS ANGELES	CA	90045
4137-005-014	NINETY MPH LLC	404 MANHATTAN AVE	MANHATTAN BEACH	CA	90266
4137-005-015	JOSEPH H CHRISMAN	209 GULL ST	MANHATTAN BEACH	CA	90266
4137-005-016	ESTEBAN R MURILLO	228 38TH PL	MANHATTAN BEACH	CA	90266
4137-005-017	ESTEBAN R MURILLO	228 38TH PL	MANHATTAN BEACH	CA	90266
4137-005-018	PAMELYN SPRIGGS	200 45TH ST	MANHATTAN BEACH	CA	90266
4137-005-019	AMIR E ETTEKAL	203 GULL ST	MANHATTAN BEACH	CA	90266
4137-005-020	CHRISTINE NAYLOR	P.O. BOX 2308	MANHATTAN BCH	CA	90267

TABLE 5-1
Property Owners within 1,000 Feet of the Project

APN	OWNER	Address	City	State	Zip
4137-005-021	EDWARD A GAVALDON	2512 PINE AVE	MANHATTAN BCH	CA	90266
4137-005-023	KIKI WAXMAN	120 45TH ST	MANHATTAN BEACH	CA	90266
4137-005-024	LARRY E & THERESA L HART	4852 AGNES AVE	VALLEY VILLAGE	CA	91607
4137-005-025	JOHN A CASASANTE	1613 CHELSEA RD #331	SAN MARINO	CA	91108
4137-005-026	JULIE A MANASFI	4202 BEEMAN AVE	STUDIO CITY	CA	91604
4137-005-027	BARRY S & CHRISTINA H ROSS	4414 OCEAN DR	MANHATTAN BEACH	CA	90266
4137-005-028	ROBERT E PERKINS	4420 THE STRAND	MANHATTAN BEACH	CA	90266
4137-005-029	LYLE L & ELSIE R CRIPE	4421 OCEAN DR	MANHATTAN BEACH	CA	90266
4137-005-030	METROPOLITAN INVESTMENTS LLC	P.O. BOX 90855	LOS ANGELES	CA	90009
4137-005-031	WAGNER BEACH PROPERTIES LLC	1015 S SCOFILLE	OAK PARK	IL	60304
4137-005-032	GREGORY J & ELLEN J HULL	P.O. BOX 1327	MANHATTAN BCH	CA	90266
4137-005-034	SILKE MALONEY	525 ALMER RD #307	BURLINGAME	CA	94010
4137-005-035	JOHN R MULLEN	4403 OCEAN DR	MANHATTAN BCH	CA	90266
4137-005-036	WAGNER BEACH PROPERTIES LLC	1015 S SCOFILLE	OAK PARK	IL	60304
4137-005-037	4400 OCEAN PROPERTIES LLC	1915 JAMESTOWN RD	MORGANTON	NC	28655
4137-005-038	JEFF FREDERICK	116 GULL ST	MANHATTAN BEACH	CA	90266
4137-005-039	STEPHEN & ALLYSON GOLDSBY	121 44TH ST	MANHATTAN BEACH	CA	90266
4137-005-040	KATHLEEN G SMITH	121 10TH ST	MANHATTAN BCH	CA	90266
4137-005-041	CHAN K OH	2824 W PICO BLVD	LOS ANGELES	CA	90006
4137-005-042	KYLE D WEINSHEIM	124 GULL ST	MANHATTAN BEACH	CA	90266
4137-005-043	MARY J MCCONNELL	129 44TH ST	MANHATTAN BEACH	CA	90266
4137-005-044	EMMETT E MILLER	212 38TH ST	MANHATTAN BEACH	CA	90266
4137-005-045	WILLIAM H & NANCY C KELLER	131 44TH ST	MANHATTAN BEACH	CA	90266
4137-005-046	CORT D ESCHERICH	200 GULL ST	MANHATTAN BEACH	CA	90266

TABLE 5-1
Property Owners within 1,000 Feet of the Project

APN	OWNER	Address	City	State	Zip
4137-005-047	SCOTT E & ALICE SADOWSKI	201 44TH ST	MANHATTAN BEACH	CA	90266
4137-005-048	PAUL T & MAMIE MANCE	6978 CREST RD	RANCHO PALOS VERD	CA	90275
4137-005-049	WALTER R ARMSTRONG	733 36TH ST	MANHATTAN BCH	CA	90266
4137-005-050	JAMES A LOWRY	213 44TH ST	MANHATTAN BEACH	CA	90266
4137-005-051	CHARLES J LOWRY	13200 PACIFIC PROMENADE #402	PLAYA VISTA	CA	90094
4137-005-052	DANA M KENIRY	426 31ST ST	HERMOSA BEACH	CA	90254
4137-005-053	PERRY L HERWOOD	P.O. BOX 3280	MANHATTAN BEACH	CA	90266
4137-005-054	VICTOR G & MURIEL S SAVIKAS	3009 BAYVIEW DR	MANHATTAN BCH	CA	90266
4137-005-055	ANTON MILLA	20600 MAIN ST SP84	CARSON	CA	90745
4137-005-056	JOHN H & ROBBIE G ATKINSON	461 34TH ST	MANHATTAN BCH	CA	90266
4137-005-057	RALPH C TISDALE	604 27TH ST	MANHATTAN BEACH	CA	90266
4137-005-058	RALPH C TISDALE	P.O. BOX 246	MANHATTAN BCH	CA	90266
4137-005-060	ANDREW L ELLIS	4404 THE STRAND	MANHATTAN BEACH	CA	90266
4137-005-061	CHASE L & MARIA M LEAVITT	4712 ADMIRALTY WAY 561	MARINA DEL REY	CA	90292
4137-006-009	SHERI A HUNT	226 44TH ST	MANHATTAN BEACH	CA	90266
4137-006-010	WAGNER BEACH PROPERTIES LLC	1015 S SCOFILLE	OAK PARK	IL	60304
4137-006-011	PERRY L HERWOOD	P.O. BOX 3280	MANHATTAN BEACH	CA	90266
4137-006-012	BRIAN & JOAN COCHRAN	36 MALAGA COVE PLZ	PALOS VERDES ESTA	CA	90274
4137-006-013	PERRY L HERWOOD	P.O. BOX 3280	MANHATTAN BEACH	CA	90266
4137-006-014	DANIEL M BROWN	3121 ALMA AVE	MANHATTAN BEACH	CA	90266
4137-006-015	JEANETTE FERRERA	1706 BELMONT LN	REDONDO BEACH	CA	90278
4137-006-016	PHILIP SOULE	P.O. BOX 1626	MANHATTAN BEACH	CA	90267
4137-006-017	BIG SKY HOLDINGS LLC	21515 HAWTHORNE BLVD 1250	TORRANCE	CA	90503
4137-006-018	ZORAN & HELENE SAJOVIC	2105 W ST MARY BLVD	LAFAYETTE	LA	70506

TABLE 5-1
Property Owners within 1,000 Feet of the Project

APN	OWNER	Address	City	State	Zip
4137-006-019	PERRY L HERWOOD	P.O. BOX 3280	MANHATTAN BEACH	CA	90266
4137-006-020	PERRY L HERWOOD	P.O. BOX 3280	MANHATTAN BEACH	CA	90266
4137-006-021	SANDRA L LEWIS	202 44TH ST	MANHATTAN BCH	CA	90266
4137-006-022	MATTHEW A & MAUREEN A SIMON	201 SHELL ST	MANHATTAN BEACH	CA	90266
4137-006-023	ANNE M MILLER	130 44TH ST	MANHATTAN BEACH	CA	90266
4137-006-024	DAVID S KARPMAN	127 SHELL ST	MANHATTAN BEACH	CA	90266
4137-006-025	JOHN E MYLREA	3621 ALMA AVE	MANHATTAN BEACH	CA	90266
4137-006-026	JOSEPH B & MELODY D BARNES	P.O. BOX 2241	MANHATTAN BEACH	CA	90267
4137-006-027	MICHAEL KATZ	1726 WESTRIDGE RD	LOS ANGELES	CA	90049
4137-006-028	P C ZAMANIGAN	121 SHELL ST	MANHATTAN BEACH	CA	90266
4137-006-030	ROSS & STEPHANIE S MITCHELL	1412 FAYMONT AVE	MANHATTAN BEACH	CA	90266
4137-006-031	DOUGLAS L CROISETTE	112 44TH ST	MANHATTAN BEACH	CA	90266
4137-006-032	DEBRA A BARNES	4321 OCEAN DR	MANHATTAN BEACH	CA	90266
4137-006-033	MICHAEL DOLEN	2030 IVAR AVE #106	LOS ANGELES	CA	90068
4137-006-034	SINV STRAND LLC	23223 NORMANDIE AVE	TORRANCE	CA	90501
4137-006-036	PETER W BOONE	4308 THE STRAND	MANHATTAN BEACH	CA	90266
4137-006-037	HENRY V ALVAREZ	4304 THE STRAND	MANHATTAN BEACH	CA	90266
4137-006-039	WILLIAM W POWELL	4310 OCEAN DR	MANHATTAN BEACH	CA	90266
4137-006-040	C HAROLD KEASLER	3500 ALMA AVE	MANHATTAN BCH	CA	90266
4137-006-041	SUSAN L HARRIS	121 43RD ST	MANHATTAN BEACH	CA	90266
4137-006-042	DAVID H BATE	112 SHELL ST	MANHATTAN BEACH	CA	90266
4137-006-043	ELENA BLOMGREN	120 SHELL ST	MANHATTAN BEACH	CA	90266
4137-006-044	SAM LIGHTBOURN	123 43RD ST	MANHATTAN BEACH	CA	90266
4137-006-045	DEBRA A SUARD	124 SHELL ST	MANHATTAN BEACH	CA	90266

TABLE 5-1
Property Owners within 1,000 Feet of the Project

APN	OWNER	Address	City	State	Zip
4137-006-046	SAM LIGHTBOURN	123 43RD ST	MANHATTAN BEACH	CA	90266
4137-006-047	MICHAEL R STEARNS	128 SHELL ST	MANHATTAN BEACH	CA	90266
4137-006-049	ELIX CORPORATION JAPAN	200 SHELL ST	MANHATTAN BEACH	CA	90266
4137-006-050	ADAH DUNCAN	2820 THE STRAND	MANHATTAN BEACH	CA	90266
4137-006-051	DUKE & SUSAN JONES	26329 MONTE VISTA AVE	LOMITA	CA	90717
4137-006-052	PATRICIA BALDIVIA	209 43RD ST	MANHATTAN BEACH	CA	90266
4137-006-053	JOHN M & JAN M WEEKLEY	2440 CHELSEA RD	PALOS VERDES ESTA	CA	90274
4137-006-054	JOHNATHAN BIRNBAUM	211 43RD ST	MANHATTAN BEACH	CA	90266
4137-006-055	DAMON GUIZOT	6412 VIA CANADA	RCH PALOS VRD	CA	90275
4137-006-056	LOUIS J & ROBERTA D COMBS	2243 SILVERSTAR ST	SIMI VALLEY	CA	93065
4137-006-057	GARY M & STEVIE FLEISHMAN	7510 W 85TH ST	PLAYA DEL REY	CA	90293
4137-006-058	ARTHUR TAN	223 43RD ST	MANHATTAN BEACH	CA	90266
4137-006-059	BREN CONNER	7417 DUNFIELD AVE	LOS ANGELES	CA	90045
4137-006-060	MICHAEL B & MARIAN A DAVIS	227 43RD ST	MANHATTAN BEACH	CA	90266
4137-006-061	ROBERT PULASKI	9645 SPYGLASS AVE #81	DSRT HOT SPGS	CA	92240
4137-006-062	BRUCE H & BRENDA GREENBERG	P.O. BOX 3465	MANHATTAN BEACH	CA	90266
4137-006-063	SEAN NEEL	226 SHELL ST	MANHATTAN BEACH	CA	90266
4137-006-064	DAVID G & HELEN J PAPKE	P.O. BOX 449	PHILO	CA	95466
4137-006-065	PAUL J & KAY B LUPO	700 TORRANCE BLVD	REDONDO BEACH	CA	90277
4137-006-069	JOAN & PETER TANSAVATDI	4303 THE STRAND	MANHATTAN BEACH	CA	90266
4137-006-070	GLENN E CUNNINGHAM	5310 PALI POINT LN	LA CANADA	CA	91011
4137-006-071	JAMES W SAVELA	4300 THE STRAND	MANHATTAN BEACH	CA	90266
4137-006-072	MARK M GALLON	4301 THE STRAND	MANHATTAN BCH	CA	90266
4137-006-073	DONALD P JENNINGS	P.O. BOX 625	MANHATTAN BEACH	CA	90267

TABLE 5-1
Property Owners within 1,000 Feet of the Project

APN	OWNER	Address	City	State	Zip
4137-006-075	WILLIAM N MORAN	229 SHELL ST #1	MANHATTAN BCH	CA	90266
4137-006-076	WILLIAM MORAN	229 SHELL ST #2	MANHATTAN BCH	CA	90266
4137-006-077	LEE S KOSBY	117 SHELL ST	MANHATTAN BEACH	CA	90266
4137-006-078	JOHN F WHITLOCK	3000 HIGHLAND AVE	MANHATTAN BCH	CA	90266
4137-006-080	DEEPAK & NANDINI CHOPRA	717 VIA LA CUESTA	PALOS VERDES ESTA	CA	90274
4137-006-081	DOMINIE & MARY E WHITE	P.O. BOX 582510	TULSA	OK	74158
4137-006-082	MARCIAL D SUAREZ	902 S DUNSMUIR AVE	LOS ANGELES	CA	90036
4137-006-083	ROBERT W FRASER	201 43RD ST	MANHATTAN BEACH	CA	90266
4137-007-009	WALTER ZURBRUGG	P.O. BOX 91322	LOS ANGELES	CA	90009
4137-007-010	DONALD & MARY L UHLE	232 43RD ST	MANHATTAN BEACH	CA	90266
4137-007-012	BENJAMIN M GTUSHALL	P.O. BOX 1180	MANHATTAN BEACH	CA	90267
4137-007-014	JORDAN CRESSMAN	217 SEAVIEW ST	MANHATTAN BEACH	CA	90266
4137-007-015	GLENN I SAITO	216 43RD ST	MANHATTAN BEACH	CA	90266
4137-007-016	LAURA M WENGLIKOWSKI	213 SEAVIEW ST	MANHATTAN BCH	CA	90266
4137-007-017	JOHNS MICHAEL G CO TR	3655 MCANANY WAY	MALIBU	CA	90265
4137-007-018	ROBERT FURBER	208 43RD ST	MANHATTAN BEACH	CA	90266
4137-007-019	STASYS J & JAN A JASAITIS	204 43RD ST	MANHATTAN BCH	CA	90266
4137-007-020	STASYS & JAN JASAITIS	204 43RD ST	MANHATTAN BEACH	CA	90266
4137-007-021	JON S MELNYK	6627 GRULLA ST	CARLSBAD	CA	92009
4137-007-022	SCOTT E ADAMSON	12021 WILSHIRE BLVD #292	LOS ANGELES	CA	90025
4137-007-023	SCHEIDIG THOMAS CO TR	122 43RD ST	MANHATTAN BEACH	CA	90266
4137-007-024	TAMMY J EVANS	56 VIA AMANTI	NEWPORT COAST	CA	92657
4137-007-028	FRIEDMAN BRADLEY J CO TR	4216 THE STRAND	MANHATTAN BEACH	CA	90266
4137-007-030	JOHN & AURORA DUGAN	126 NEPTUNE AVE	HERMOSA BEACH	CA	90254

TABLE 5-1
Property Owners within 1,000 Feet of the Project

APN	OWNER	Address	City	State	Zip
4137-007-031	SPATES RICHARD M CO TR	2532 VIA RIVERA	PALOS VERDES ESTA	CA	90274
4137-007-032	JOSEPH W DUKE	4200 THE STRAND	MANHATTAN BEACH	CA	90266
4137-007-033	FREDERICK A & KAREN R LORIG	1 SPUR LN	ROLLING HILLS	CA	90274
4137-007-034	DANA F WEINSTEIN	13460 GRANITE CREEK RD	SAN DIEGO	CA	92128
4137-007-035	BRUCE H & JANE C LETVIN	P.O. BOX 1064	MANHATTAN BEACH	CA	90267
4137-007-036	RICHARD E FARMER	116 SEAVIEW ST	MANHATTAN BEACH	CA	90266
4137-007-037	DANIEL M & KELLY O WICKEMEYER	117 42ND ST	MANHATTAN BEACH	CA	90266
4137-007-038	JEFFREY R TROTT	1888 CENTURY PARK E #900	LOS ANGELES	CA	90067
4137-007-039	ROBERTA M AGE	126 SEAVIEW ST	MANHATTAN BEACH	CA	90266
4137-007-040	PAUL AND PILAR LLC	18881 VON KARMAN AVE #1175	IRVINE	CA	92612
4137-007-041	JAI WOOK PARK	130 SEAVIEW ST	MANHATTAN BEACH	CA	90266
4137-007-042	JANET R & ROBERT H LONDON	129 42ND ST	MANHATTAN BEACH	CA	90266
4137-007-043	JAMES & ASHLEY SAVELA	4300 THE STRAND	MANHATTAN BEACH	CA	90266
4137-007-044	MARY K DONAHOE	201 42ND ST	MANHATTAN BEACH	CA	90266
4137-007-045	HUNG T NGUYEN	725 SIERRA ST	EL SEGUNDO	CA	90245
4137-007-046	STEPHEN F LORE	1543 ROSCOMARE RD	LOS ANGELES	CA	90077
4137-007-047	KIRK W & JANETTE C BROWN	361 MAIN ST	EL SEGUNDO	CA	90245
4137-007-048	ANDREW ROTH	10122 EMPYREAN WAY #101	LOS ANGELES	CA	90067
4137-007-049	STEVEN D GILMOUR	300 W GLENOAKS BLVD #301	GLENDALE	CA	91202
4137-007-050	JOSEPH R RADISICH	215 42ND ST	MANHATTAN BEACH	CA	90266
4137-007-051	MICHAEL J & MELINDA SAGGIANI	216 SEAVIEW ST	MANHATTAN BEACH	CA	90266
4137-007-052	LYNDAMARIE TR	5016 N PARKWAY CALABASAS #200	CALABASAS	CA	91302
4137-007-053	CRAIG J MCMANIS	220 SEAVIEW ST	MANHATTAN BEACH	CA	90266
4137-007-054	CHARLES & MARILYN MILAM	129 18TH ST	MANHATTAN BCH	CA	90266

TABLE 5-1
Property Owners within 1,000 Feet of the Project

APN	OWNER	Address	City	State	Zip
4137-007-055	KIRSTIE BARRETT	224 SEAVIEW ST	MANHATTAN BEACH	CA	90266
4137-007-056	JAMES WADE	515 N PAULINA AVE	REDONDO BEACH	CA	90277
4137-007-057	MYRON & ANNE KLAFTER	601 36TH ST	MANHATTAN BCH	CA	90266
4137-007-058	XIVA LI	135 RICHMOND ST	EL SEGUNDO	CA	90245
4137-007-059	JARYL W CRAMTON	3801 E HIGHWAY 66	KINGMAN	AZ	86401
4137-007-060	ANNE M KNOTT	319 BAYVIEW DR	MANHATTAN BEACH	CA	90266
4137-007-063	BARRY R TIETLER	1215 HIGHLAND AVE	MANHATTAN BCH	CA	90266
4137-007-064	JASPER J & LAURA BLYSTONE	P.O. BOX 5129	PLAYA DEL REY	CA	90296
4137-007-066	BRIAN M OLSON	121 42ND ST	MANHATTAN BEACH	CA	90266
4137-007-070	DAVID A BEUGEN	4220 THE STRAND	MANHATTAN BEACH	CA	90266
4137-007-071	GREGORY W & JEANNE L MORGAN	4230 THE STRAND	MANHATTAN BEACH	CA	90266
4137-007-072	SAMUEL W HO	4220 OCEAN DR #1	MANHATTAN BCH	CA	90266
4137-007-073	SARA E OBERLIES	957 LEAVENWORTH ST	SAN FRANCISCO	CA	94109
4137-007-074	BRETT SILEO	4216 OCEAN DR #3	MANHATTAN BEACH	CA	90266
4137-007-075	NICKOLAS A TOMASIC	4218 OCEAN DR	MANHATTAN BEACH	CA	90266
4137-007-076	WARREN B EADS	930 TAHOE BLVD #802	INCLINE VILLAGE	NV	89451
4137-007-078	JOHN CHUKA	1215 HIGHLAND AVE	MANHATTAN BCH	CA	90266
4137-007-079	JOHN CHUKA	1215 HIGHLAND AVE	MANHATTAN BCH	CA	90266
4137-007-081	RIAD & AUDREY DIMASHKIEH	4202 BEEMAN AVE	STUDIO CITY	CA	91604
4137-007-082	RIAD & AUDREY DIMASHKIEH	4202 BEEMAN AVE	STUDIO CITY	CA	91604
4137-007-083	RIAD & AUDREY DIMASHKIEH	4202 BEEMAN AVE	STUDIO CITY	CA	91604
4137-007-085	JEFFREY E DAVIS	221 SEAVIEW ST	MANHATTAN BEACH	CA	90266
4137-007-086	SATISH S KADABA	220 43RD ST	MANHATTAN BEACH	CA	90266
4137-007-088	GRADY MICHAEL CO TR	228 43RD ST	MANHATTAN BEACH	CA	90266

TABLE 5-1
Property Owners within 1,000 Feet of the Project

APN	OWNER	Address	City	State	Zip
4137-007-089	JOSHUA T & KIMBERLY GRANT	88 WASHINGTON PL #3A	NEW YORK	NY	10011
4137-008-001	JOSE & ELIZABETH Y ALVAREZ	1503 GOODMAN AVE	REDONDO BEACH	CA	90278
4137-008-002	RICHARD B & BETTY W PECHARICH	661 W 30TH ST	SAN PEDRO	CA	90731
4137-008-004	SUSAN M SWAN	226 42ND ST	MANHATTAN BEACH	CA	90266
4137-008-005	YASEMIN & JOHN VICKERY	15536 HAMNER DR	LOS ANGELES	CA	90077
4137-008-006	J BLAKE SATHOFF	2315 NELSON AVE	REDONDO BEACH	CA	90278
4137-008-007	HARLAN A & EDREN M HELVEY	P.O. BOX 3400	MANHATTAN BCH	CA	90266
4137-008-008	RICHARD D GERVAIS	216 42ND ST	MANHATTAN BEACH	CA	90266
4137-008-009	CHARLES D & MARILYN S MILAM	129 18TH ST	MANHATTAN BEACH	CA	90266
4137-008-010	HESHAM A & DALAL T KARAMA	30233 VIA RIVERA	RANCHO PALOS VERD	CA	90275
4137-008-011	PERRY L HERWOOD	P.O. BOX 3280	MANHATTAN BEACH	CA	90266
4137-008-012	AARON H CAPLAN	208 42ND ST	MANHATTAN BEACH	CA	90266
4137-008-013	JEROME TAIN	209 MOONSTONE ST	MANHATTAN BEACH	CA	90266
4137-008-014	STEVEN A & TERESA MANGIAGI	2007 CIRCLE DR	HERMOSA BEACH	CA	90254
4137-008-015	RAYMOND J & LAURA D RIBAR	318 THE STRAND	HERMOSA BEACH	CA	90254
4137-008-016	MICHAEL W STURROCK	633 W 5TH ST #4000	LOS ANGELES	CA	90071
4137-008-017	ROBERT D GALLMAN	201 MOONSTONE ST	MANHATTAN BEACH	CA	90266
4137-008-018	G RODERICK SHERRIFFS	76194 HONEYSUCKLE DR	PALM DESERT	CA	92211
4137-008-019	LAURENCE & DARALEE S BARBERA	129 MOONSTONE ST	MANHATTAN BEACH	CA	90266
4137-008-020	ERIC A WARD	124 42ND ST	MANHATTAN BEACH	CA	90266
4137-008-021	MICHAEL S ALLEN	P.O. BOX 877	MANHATTAN BEACH	CA	90267
4137-008-022	CHARLES & MARILYN MILAM	129 18TH ST	MANHATTAN BCH	CA	90266
4137-008-023	MARY A STEWARD	121 MOONSTONE ST	MANHATTAN BEACH	CA	90266
4137-008-024	MELVIN & MARGARET SCHEINMAN	3566 JACKSON ST	SAN FRANCISCO	CA	94118

TABLE 5-1
Property Owners within 1,000 Feet of the Project

APN	OWNER	Address	City	State	Zip
4137-008-025	THOMAS C & KATHY R BERG	26621 HAWKHURST DR	RCH PALOS VRD	CA	90275
4137-008-026	PAUL J MARCHINI	2005 PASEO DEL SOL	PALOS VERDES ESTA	CA	90274
4137-008-027	EUGENIA B TUKAJ GARMAN	4112 OCEAN DR	MANHATTAN BEACH	CA	90266
4137-008-028	JACK R & BETTY A STEPHENS	4120 THE STRAND	MANHATTAN BCH	CA	90266
4137-008-029	STEPHENS FAMILY PARTNERSHIP II	4120 THE STRAND	MANHATTAN BCH	CA	90266
4137-008-031	STUART H SACKLEY	4108 THE STRAND	MANHATTAN BEACH	CA	90266
4137-008-032	LAREE BENNETT	4104 THE STRAND	MANHATTAN BEACH	CA	90266
4137-008-034	PEGGY H MALPEE	117 41ST ST	MANHATTAN BEACH	CA	90266
4137-008-035	PEGGY H MALPEE	117 41ST ST	MANHATTAN BEACH	CA	90266
4137-008-037	RICHARD A MARINO	121 41ST ST	MANHATTAN BEACH	CA	90266
4137-008-039	THOMAS NEAL	613 18TH ST	MANHATTAN BEACH	CA	90266
4137-008-040	LISHAN T WORKENEH	124 MOONSTONE ST	MANHATTAN BEACH	CA	90266
4137-008-041	HOWARD D NUNN	129 41ST ST	MANHATTAN BEACH	CA	90266
4137-008-042	JAMES R & JOYCE E KOSINSKI	128 MOONSTONE ST	MANHATTAN BEACH	CA	90266
4137-008-043	H BERNARD & SOPHIE QUANTE	201 41ST ST	MANHATTAN BEACH	CA	90266
4137-008-044	GREGORY J CHEREP	200 MOONSTONE ST	MANHATTAN BEACH	CA	90266
4137-008-045	MICHAEL P ERNST	205 41ST ST	MANHATTAN BEACH	CA	90266
4137-008-046	AARON M PERLMUTTER	1744 HERMOSA AVE	HERMOSA BEACH	CA	90254
4137-008-047	THEODORE W RANDALL	209 41ST ST	MANHATTAN BEACH	CA	90266
4137-008-048	RICHARD B & BETTY W PECHARICH	661 W 30TH ST	SAN PEDRO	CA	90731
4137-008-049	DANTE T BOUTELL	416 20TH ST	MANHATTAN BCH	CA	90266
4137-008-050	GUY B KATICH	P.O. BOX 3576	MANHATTAN BEACH	CA	90266
4137-008-051	GREGORY S MORAN	219 41ST ST	MANHATTAN BEACH	CA	90266
4137-008-052	SUZANNE R PERLES	216 MOONSTONE ST	MANHATTAN BEACH	CA	90266

TABLE 5-1
Property Owners within 1,000 Feet of the Project

APN	OWNER	Address	City	State	Zip
4137-008-053	GREGORY K POUSSON	P.O. BOX 2484	REDONDO BEACH	CA	90278
4137-008-054	DANIEL GOETSCHEL	4975 MAYNARD ST	SAN DIEGO	CA	92122
4137-008-055	RYAN C HERMANN	225 41ST ST	MANHATTAN BEACH	CA	90266
4137-008-056	DARIN S PUHL	319 MAIN ST	EL SEGUNDO	CA	90245
4137-008-057	HA & TUYET V TRAN	1201 23RD ST	MANHATTAN BEACH	CA	90266
4137-008-058	HA & TUYET V TRAN	1201 23RD ST	MANHATTAN BEACH	CA	90266
4137-008-059	PEGGY H MALPEE	117 41ST ST	MANHATTAN BEACH	CA	90266
4137-008-061	SAMUEL J BRAITMAN	4102 THE STRAND	MANHATTAN BCH	CA	90266
4137-008-062	SAMUEL J BRAITMAN	4102 THE STRAND	MANHATTAN BEACH	CA	90266
4137-008-064	WILLIAM F SCHINBINE	228 42ND ST	MANHATTAN BEACH	CA	90266
4137-008-065	SAMI REVAH	229 MOONSTONE ST	MANHATTAN BEACH	CA	90266
4137-008-067	BRUCE D SIDLINGER	P.O. BOX 3148	MANHATTAN BEACH	CA	90266
4137-008-068	BRUCE D SIDLINGER	P.O. BOX 3148	MANHATTAN BEACH	CA	90266
4137-009-011	SUZANNE HARRIS	204 41ST ST	MANHATTAN BEACH	CA	90266
4137-009-013	SUZANNE HARRIS	204 41ST ST	MANHATTAN BEACH	CA	90266
4137-009-015	RUBIN CATHY L DECD EST OF	P.O. BOX 288	REDONDO BEACH	CA	90277
4137-009-017	RICHARD J & DONNA J PIAZZA	2612 PINE AVE	MANHATTAN BCH	CA	90266
4137-009-019	MICHELE MCGARRY	1262 BERYL ST PMB#41	REDONDO BEACH	CA	90277
4137-009-021	JAMES M CHILDS	1304 PINE AVE	MANHATTAN BCH	CA	90266
4137-009-023	GLADI M ADAMS	1122 W SUMMERLAND AVE	SAN PEDRO	CA	90732
4137-009-025	BRUCE K & SUSAN J JACKSON	4020 THE STRAND	MANHATTAN BEACH	CA	90266
4137-009-026	BERNICE K MATHEWS	1204 IRON ST	SAINT LOUIS	MO	63111
4137-013-900	L A COUNTY	500 W TEMPLE ST #754	LOS ANGELES	CA	90012
4137-013-902	L A COUNTY	500 W TEMPLE ST #754	LOS ANGELES	CA	90012

TABLE 5-1
Property Owners within 1,000 Feet of the Project

APN	OWNER	Address	City	State	Zip
4137-013-905	L A COUNTY	500 W TEMPLE ST #754	LOS ANGELES	CA	90012
4137-013-908	L A COUNTY	500 W TEMPLE ST #754	LOS ANGELES	CA	90012
4138-016-004	CHEVRON USA INC	P O BOX 285	HOUSTON	TX	77001
4138-016-008	CHEVRON USA INC	P O BOX 285	HOUSTON	TX	77001
4138-016-009	CHEVRON USA INC	P O BOX 285	HOUSTON	TX	77001
4138-016-012	CHEVRON USA INC	P O BOX 285	HOUSTON	TX	77001
4138-016-013	CHEVRON USA INC	P O BOX 285	HOUSTON	TX	77001
4138-029-003	CHEVRON USA INC	P O BOX 1392	BAKERSFIELD	CA	93302

SECTION 6.0

Potential Effects on Property Owners

Consistent with the CEC Siting Regulations Section 1769(a)(1)(I), this section addresses potential effects of the proposed Amendment on nearby property owners, the public, and parties in the application proceeding. Implementation of the ESPFM is expected to result in equal or less environmental impacts. The ESPFM will eliminate once-through cooling and ocean discharge of industrial and sanitary wastewater. Therefore, impacts to property owners are expected to be equal to or less than those analyzed during the 00-AFC-14 license proceeding. The operational impacts of the ESPFM will not result in significant unmitigated environmental.

Appendices 3.1A–H
Air Quality Technical Information

APPENDIX 3.1A – EMISSIONS CALCULATIONS AND SUPPORT DATA

Table 3.1A-1
El Segundo Power Facility Modification
Operating Parameters for Gas Turbine (GE) (Performance Runs)

Case	Hot Peak	Hot Base (cooler)	Hot Base	Hot Low	Mild Peak	Mild Base (cooler)	Mild Base	Mild Low	Cold Peak	Cold Base	Cold Low
CTG Gross Power, MW	205	205	195	91	211	211	204	94	222	222	100
STG Gross Power, MW	100	81	79	62	105	84	84	64	112	87	65
Ambient Temp, F	90	90	90	90	78	78	78	78	41	41	41
Turbine Load, %	100%	100%	100%	47%	100%	100%	100%	46%	100%	100%	45%
CTG Heat Input, MMBTU/Hr (HHV)	2,055	2,055	1,965	1,243	2,093	2,093	2,035	1,257	2,168	2,168	1,319
Duct Burner Input, MMBTU/hr	267	0	0	0	265	0	0	0	268	0	0
Stack Flow, lb/hr	4,093,977	4,082,373	3,939,982	2,662,056	4,146,579	4,135,263	4,062,573	2,657,298	4,220,097	4,204,939	2,704,195
Stack Flow, acfm	1,264,751	1,256,250	1,212,535	780,393	1,263,131	1,258,688	1,235,473	767,463	1,236,686	1,256,058	774,214
Stack Flow, dscfm	818,617	822,927	801,780	543,892	835,112	839,430	829,672	544,589	859,239	862,804	556,803
Stack Temp, F	254	253	250	218	244	245	244	209	219	233	204
Stack Exhaust, vol %											
O2 (dry)	12.54%	13.54%	13.68%	14.17%	12.57%	13.55%	13.67%	14.10%	12.54%	13.50%	13.92%
CO2 (dry)	4.82%	4.25%	4.17%	3.89%	4.80%	4.24%	4.18%	3.93%	4.82%	4.28%	4.03%
H2O	11.60%	10.70%	9.41%	8.95%	10.61%	9.73%	8.90%	8.50%	9.06%	8.18%	7.78%

NOTE: Heat Input based on project design fuel heat content of 1030 MMBtu/SCF

Table 3.1A-2
El Segundo Power Facility Modification
Emissions and Operating Parameters for Gas Turbine (Trent, each) (Performance Runs)

Case	Hot Base (cooler)	Hot Base	Hot Low	Mild Base (cooler)	Mild Base	Mild Low	Cold Base	Cold Low
CTG Gross Power, MW	55	42	23	57	46	25	57	32
Ambient Temp, F	90	90	90	78	78	78	41	41
Turbine Load, %	100%	100%	55%	100%	100%	55%	100%	55%
CTG Heat Input, MMBTU/Hr (HHV)	500	406	292	516	430	305	511	337
Stack Flow, lb/hr	1,223,803	1,043,554	837,662	1,250,350	1,101,098	875,919	1,291,452	1,022,250
Stack Flow, acfm	691,769	602,502	458,651	701,728	626,839	471,868	707,090	512,594
Stack Flw, dscfm	249,644	215,287	173,672	256,795	227,986	182,304	269,368	214,934
Stack Temp, F	818	863	844	809	846	824	799	737
Stack Exhaust, vol %								
O2 (dry)	15.01%	15.36%	15.96%	14.99%	15.36%	15.99%	15.33%	16.29%
CO2 (dry)	3.42%	3.22%	2.87%	3.43%	3.22%	2.86%	3.23%	2.68%
H2O	9.38%	7.85%	7.27%	8.41%	7.32%	6.72%	6.23%	5.29%

NOTE: Heat Input based on project design fuel heat content of 1030 MMBtu/SCF

Table 3.1A-3
El Segundo Power Facility Modification
Auxiliary Boiler

Device	Aux Boiler
Fuel	Natural Gas
Maximum Heat Input (MMBtu/hr)	36
F-factor (dscf/MMBtu)	8,710
F-factor (wscf/MMBtu)	10,610
Reference O2	3.0%
Actual O2	5.1%
Exhaust Temperature (F)	300
Exhaust Rate (dscfm @ 3% O2)	6,099
Exhaust Rate (wacfm @ actual O2)	8,414

Pollutant	Emission Factors (lb/MMBtu)	Maximum Emissions (lb/hr)
CO	0.0370	1.3
NOx	0.0109	0.4
PM10	0.0075	0.3
SOx	0.0021	0.1
VOC	0.0040	0.1

Maximum Operating Hours		Emissions (lbs/day, lb/month, ton/yr) at 25% load[1]				
		CO	NOx	VOC	PM10	SOx
Daily	24	8.0	2.4	0.9	1.6	0.4
Monthly	744	247.4	73.2	26.8	49.9	13.9
Annual	8760	1.5	0.4	0.2	0.3	0.1

Note 1: Boiler operates at 25% load when Unit 9 is not operating. Boiler does not operate at all when Unit 9 is operating, except for the first 20 minutes of startup, when it operates at 100% load. Daily, monthly, and annual emissions are calculated at 25% load.

Table 3.1A-4
El Segundo Power Facility Modification
Turbine Startup/Shutdown Emissions

Mode	Time (minutes)	Total Emissions Per Event (pounds)			
		NOx	CO	VOC	PM
GE Turbine					
Startup (fast start)	30	36	153	14	5
Startup (traditional)	60	62	291	23	5
Shutdown	30	29	317	32	2
Trent Turbine					
Startup	30	28.0	87.5	6.7	3.8
Shutdown	20	7.1	60.0	4.7	2.2

Table 3.1A-5
El Segundo Power Facility Modification
CO Emissions (GE Turbine) (District Methodology)

Operating Condition	Heat Input (MMBTU/hr)	Pollutant Conc. Uncontrolled (ppmvd)	Pollutant Conc. Controlled (ppmvd)	Molecular Weight (lbs/lb-mole)	Specific Molar Volume (dscf/lb-mole)	Dry Fuel Factor (dscf/ MMBTU)	Emission Factor Uncontrolled (lb/MMBTU)	Emission Factor Controlled (lb/MMBTU)	Emission Rate Uncontrolled (lb/hr)	Emission Rate Controlled (lb/hr)
Hot Peak	2,322	4.0	2.0	28	385.3	8,710	0.0090	0.0045	20.8	10.4
Hot Base (cooler)	2,055	4.0	2.0	28	385.3	8,710	0.0090	0.0045	18.4	9.2
Hot Base	1,965	4.0	2.0	28	385.3	8,710	0.0090	0.0045	17.6	8.8
Hot Low	1,243	4.0	2.0	28	385.3	8,710	0.0090	0.0045	11.1	5.6
Mild Peak	2,358	4.0	2.0	28	385.3	8,710	0.0090	0.0045	21.1	10.6
Mild Base (cooler)	2,093	4.0	2.0	28	385.3	8,710	0.0090	0.0045	18.8	9.4
Mild Base	2,035	4.0	2.0	28	385.3	8,710	0.0090	0.0045	18.3	9.1
Mild Low	1,257	4.0	2.0	28	385.3	8,710	0.0090	0.0045	11.3	5.6
Cold Peak	2,436	4.0	2.0	28	385.3	8,710	0.0090	0.0045	21.8	10.9
Cold Base	2,168	4.0	2.0	28	385.3	8,710	0.0090	0.0045	19.4	9.7
Cold Low	1,319	4.0	2.0	28	385.3	8,710	0.0090	0.0045	11.8	5.9
Average	1,932								17.3	8.7

NOTE: Heat Input based on project design fuel heat content of 1030 MMBtu/SCF

Table 3.1A-6
El Segundo Power Facility Modification
NOx Emissions (GE Turbine) (District Methodology)

Operating Condition	Heat Input (MMBTU/hr)	Pollutant Conc. Uncontrolled (ppmvd)	Pollutant Conc. Controlled (ppmvd)	Molecular Weight (lb/lb-mol)	Specific Molar Volume (dscf/lb-mole)	Dry Fuel Factor (dscf/ MMBTU)	Emission Factor Uncontrolled (lb/MMBTU)	Emission Factor Controlled (lb/MMBTU)	Emission Rate Uncontrolled (lb/hr)	Emission Rate Controlled (lb/hr)
Hot Peak	2,322	9.0	2.0	46	385.3	8,710	0.0332	0.0074	77.0	17.1
Hot Base (cooler)	2,055	9.0	2.0	46	385.3	8,710	0.0332	0.0074	68.1	15.1
Hot Base	1,965	9.0	2.0	46	385.3	8,710	0.0332	0.0074	65.2	14.5
Hot Low	1,243	9.0	2.0	46	385.3	8,710	0.0332	0.0074	41.2	9.2
Mild Peak	2,358	9.0	2.0	46	385.3	8,710	0.0332	0.0074	78.2	17.4
Mild Base (cooler)	2,093	9.0	2.0	46	385.3	8,710	0.0332	0.0074	69.4	15.4
Mild Base	2,035	9.0	2.0	46	385.3	8,710	0.0332	0.0074	67.5	15.0
Mild Low	1,257	9.0	2.0	46	385.3	8,710	0.0332	0.0074	41.7	9.3
Cold Peak	2,436	9.0	2.0	46	385.3	8,710	0.0332	0.0074	80.8	17.9
Cold Base	2,168	9.0	2.0	46	385.3	8,710	0.0332	0.0074	71.9	16.0
Cold Low	1,319	9.0	2.0	46	385.3	8,710	0.0332	0.0074	43.7	9.7
Average	1,932								64.0	14.2

NOTE: Heat Input based on project design fuel heat content of 1030 MMBtu/SCF

Table 3.1A-7
El Segundo Power Facility Modification
VOC Emissions (GE Turbine) (District Methodology)

Operating Condition	Heat Input (MMBTU/hr)	Pollutant Conc. Uncontrolled (ppmvd)	Pollutant Conc. Controlled (ppmvd)	Molecular Weight (lb/lb-mol)	Specific Molar Volume (dscf/lb-mol)	Dry Fuel Factor (dscf/MMBTU)	Emission Factor Uncontrolled (lb/MMBTU)	Emission Factor Controlled (lb/MMBTU)	Emission Rate Uncontrolled (lb/hr)	Emission Rate Controlled (lb/hr)
Hot Peak	2,322	2.0	2.0	16	385.3	8,710	0.0026	0.0026	5.9	5.9
Hot Base (cooler)	2,055	2.0	2.0	16	385.3	8,710	0.0026	0.0026	5.3	5.3
Hot Base	1,965	2.0	2.0	16	385.3	8,710	0.0026	0.0026	5.0	5.0
Hot Low	1,243	2.0	2.0	16	385.3	8,710	0.0026	0.0026	3.2	3.2
Mild Peak	2,358	2.0	2.0	16	385.3	8,710	0.0026	0.0026	6.0	6.0
Mild Base (cooler)	2,093	2.0	2.0	16	385.3	8,710	0.0026	0.0026	5.4	5.4
Mild Base	2,035	2.0	2.0	16	385.3	8,710	0.0026	0.0026	5.2	5.2
Mild Low	1,257	2.0	2.0	16	385.3	8,710	0.0026	0.0026	3.2	3.2
Cold Peak	2,436	2.0	2.0	16	385.3	8,710	0.0026	0.0026	6.2	6.2
Cold Base	2,168	2.0	2.0	16	385.3	8,710	0.0026	0.0026	5.6	5.6
Cold Low	1,319	2.0	2.0	16	385.3	8,710	0.0026	0.0026	3.4	3.4
Average	1,932								5.0	5.0

NOTE: Heat Input based on project design fuel heat content of 1030 MMBtu/SCF

Table 3.1A-8
El Segundo Power Facility Modification
PM10 Emissions (GE Turbine) (District Methodology)

Operating Condition	Heat Input (MMBTU/hr)	Emission Factor (lb/MMBTU)	Emission Rate Uncontrolled (lb/hr)	Emission Rate Controlled (lb/hr)
Hot Peak	2,322	0.0041	9.5	9.5
Hot Base (cooler)	2,055	0.0046	9.5	9.5
Hot Base	1,965	0.0048	9.5	9.5
Hot Low	1,243	0.0076	9.5	9.5
Mild Peak	2,358	0.0040	9.5	9.5
Mild Base (cooler)	2,093	0.0045	9.5	9.5
Mild Base	2,035	0.0047	9.5	9.5
Mild Low	1,257	0.0076	9.5	9.5
Cold Peak	2,436	0.0039	9.5	9.5
Cold Base	2,168	0.0044	9.5	9.5
Cold Low	1,319	0.0072	9.5	9.5
Average	1,932		9.5	9.5
NOTE: Heat Input based on project design fuel heat content of 1030 MMBtu/SCF				

Table 3.1A-9
El Segundo Power Facility Modification
SOx Emissions (GE Turbine) (District Methodology)

Operating Condition	Heat Input (MMBTU/hr)	Short-Term Emission Factor[1] (lb/MMBTU)	Long-Term Emission Factor[1] (lb/MMBTU)	Short-Term		Long-Term	
				Emission Rate Uncontrolled (lb/hr)	Emission Rate Controlled (lb/hr)	Emission Rate Uncontrolled (lb/hr)	Emission Rate Controlled (lb/hr)
Hot Peak	2,322	0.00208	0.00069	4.8	4.8	1.6	1.6
Hot Base (cooler)	2,055	0.00208	0.00069	4.3	4.3	1.4	1.4
Hot Base	1,965	0.00208	0.00069	4.1	4.1	1.4	1.4
Hot Low	1,243	0.00208	0.00069	2.6	2.6	0.9	0.9
Mild Peak	2,358	0.00208	0.00069	4.9	4.9	1.6	1.6
Mild Base (cooler)	2,093	0.00208	0.00069	4.4	4.4	1.5	1.5
Mild Base	2,035	0.00208	0.00069	4.2	4.2	1.4	1.4
Mild Low	1,257	0.00208	0.00069	2.6	2.6	0.9	0.9
Cold Peak	2,436	0.00208	0.00069	5.1	5.1	1.7	1.7
Cold Base	2,168	0.00208	0.00069	4.5	4.5	1.5	1.5
Cold Low	1,319	0.00208	0.00069	2.7	2.7	0.9	0.9
Average	1,932			4.0	4.0	1.3	1.3

[1] Based on a maximum long-term sulfur content of 0.25 grains/100 scf fuel; 1,030 BTU/scf natural gas; and 7,000 grains/lb, and 1 mole S for 2 moles SO_2
Based on maximum short-term sulfur content of 0.75 grains/100 scf fuel

SOx = (0.25 gr/100scf)(1 scf/1,030 BTU)(lb/7,000 gr)(2 mol SO_2/1 mol S)(1,000,000 BTU/MMBTU) = 0.00069 lb/MMBTU

SOx = (0.75 gr/100scf)(1 scf/1,030 BTU)(lb/7,000 gr)(2 mol SO_2/1 mol S)(1,000,000 BTU/MMBTU) = 0.00208 lb/MMBTU

NOTE: Heat Input based on project design fuel heat content of 1030 MMBtu/SCF

Table 3.1A-10
El Segundo Power Facility Modification
NH3 Emissions (GE Turbine) (District Methodology)

Operating Condition	Heat Input (MMBTU/hr)	Pollutant Conc. Controlled (ppmvd)	Molecular Weight (lb/lb-mol)	Specific Molar Volume (dscf/lb-mol)	Dry Fuel Factor (dscf/MMBTU)	Emission Factor (lb/MMBTU)	Emission Rate (lb/hr)
Hot Peak	2,322	5	17	385.3	8,710	0.0068	15.8
Hot Base (cooler)	2,055	5	17	385.3	8,710	0.0068	14.0
Hot Base	1,965	5	17	385.3	8,710	0.0068	13.4
Hot Low	1,243	5	17	385.3	8,710	0.0068	8.5
Mild Peak	2,358	5	17	385.3	8,710	0.0068	16.0
Mild Base (cooler)	2,093	5	17	385.3	8,710	0.0068	14.2
Mild Base	2,035	5	17	385.3	8,710	0.0068	13.9
Mild Low	1,257	5	17	385.3	8,710	0.0068	8.6
Cold Peak	2,436	5	17	385.3	8,710	0.0068	16.6
Cold Base	2,168	5	17	385.3	8,710	0.0068	14.8
Cold Low	1,319	5	17	385.3	8,710	0.0068	9.0
Average	1,932						13.1

NOTE: Heat Input based on project design fuel heat content of 1030 MMBtu/SCF

Table 3.1A-11
El Segundo Power Facility Modification
CO Emissions (Trent Turbine, Each)

Operating Condition	Heat Input (MMBTU/hr)	Pollutant Conc. Uncontrolled (ppmvd)	Pollutant Conc. Controlled (ppmvd)	Molecular Weight (lbs/lb-mole)	Specific Molar Volume (dscf/lb-mole)	Dry Fuel Factor (dscf/MMBTU)	Emission Factor Uncontrolled (lb/MMBTU)	Emission Factor Controlled (lb/MMBTU)	Emission Rate Uncontrolled (lb/hr)	Emission Rate Controlled (lb/hr)
Hot Base (cooler)	500	17.0	4.0	28	385.3	8,710	0.0381	0.0090	19.1	4.5
Hot Base	406	17.0	4.0	28	385.3	8,710	0.0381	0.0090	15.5	3.6
Hot Low	292	17.0	4.0	28	385.3	8,710	0.0381	0.0090	11.1	2.6
Mild Base (cooler)	516	17.0	4.0	28	385.3	8,710	0.0381	0.0090	19.7	4.6
Mild Base	430	17.0	4.0	28	385.3	8,710	0.0381	0.0090	16.4	3.9
Mild Low	305	17.0	4.0	28	385.3	8,710	0.0381	0.0090	11.6	2.7
Cold Base	511	17.0	4.0	28	385.3	8,710	0.0381	0.0090	19.5	4.6
Cold Low	337	17.0	4.0	28	385.3	8,710	0.0381	0.0090	12.9	3.0
Average	412								**15.7**	**3.7**

NOTE: Heat Input based on project design fuel heat content of 1030 MMBtu/SCF

Table 3.1A-12
El Segundo Power Facility Modification
NOx Emissions (Trent Turbine, Each)

Operating Condition	Heat Input (MMBTU/hr)	Pollutant Conc. Uncontrolled (ppmvd)	Pollutant Conc. Controlled (ppmvd)	Molecular Weight (lb/lb-mol)	Specific Molar Volume (dscf/lb-mole)	Dry Fuel Factor (dscf/MMBTU)	Emission Factor Uncontrolled (lb/MMBTU)	Emission Factor Controlled (lb/MMBTU)	Emission Rate Uncontrolled (lb/hr)	Emission Rate Controlled (lb/hr)
Hot Base (cooler)	500	25.0	2.5	46	385.3	8,710	0.0921	0.0092	46.1	4.6
Hot Base	406	25.0	2.5	46	385.3	8,710	0.0921	0.0092	37.4	3.7
Hot Low	292	25.0	2.5	46	385.3	8,710	0.0921	0.0092	26.9	2.7
Mild Base (cooler)	516	25.0	2.5	46	385.3	8,710	0.0921	0.0092	47.5	4.8
Mild Base	430	25.0	2.5	46	385.3	8,710	0.0921	0.0092	39.6	4.0
Mild Low	305	25.0	2.5	46	385.3	8,710	0.0921	0.0092	28.1	2.8
Cold Base	511	25.0	2.5	46	385.3	8,710	0.0921	0.0092	47.0	4.7
Cold Low	337	25.0	2.5	46	385.3	8,710	0.0921	0.0092	31.1	3.1
Average	412								**38.0**	**3.8**

NOTE: Heat Input based on project design fuel heat content of 1030 MMBtu/SCF

Table 3.1A-13
El Segundo Power Facility Modification
VOC Emissions (Trent Turbine, Each)

Operating Condition	Heat Input (MMBTU/hr)	Pollutant Conc. Uncontrolled (ppmvd)	Pollutant Conc. Controlled (ppmvd)	Molecular Weight (lb/lb-mol)	Specific Molar Volume (dscf/lb-mol)	Dry Fuel Factor (dscf/MMBTU)	Emission Factor Uncontrolled (lb/MMBTU)	Emission Factor Controlled (lb/MMBTU)	Emission Rate Uncontrolled (lb/hr)	Emission Rate Controlled (lb/hr)
Hot Base (cooler)	500	5.0	2.0	16	385.3	8,710	0.0064	0.0026	3.2	1.3
Hot Base	406	5.0	2.0	16	385.3	8,710	0.0064	0.0026	2.6	1.0
Hot Low	292	5.0	2.0	16	385.3	8,710	0.0064	0.0026	1.9	0.7
Mild Base (cooler)	516	5.0	2.0	16	385.3	8,710	0.0064	0.0026	3.3	1.3
Mild Base	430	5.0	2.0	16	385.3	8,710	0.0064	0.0026	2.8	1.1
Mild Low	305	5.0	2.0	16	385.3	8,710	0.0064	0.0026	2.0	0.8
Cold Base	511	5.0	2.0	16	385.3	8,710	0.0064	0.0026	3.3	1.3
Cold Low	337	5.0	2.0	16	385.3	8,710	0.0064	0.0026	2.2	0.9
Average	412								**2.6**	**1.1**

NOTE: Heat Input based on project design fuel heat content of 1030MMBtu/SCF

Table 3.1A-14
El Segundo Power Facility Modification
PM10 Emissions (Trent Turbine, Each)

Operating Condition	Heat Input (MMBTU/hr)	Emission Factor (lb/MMBTU)	Emission Rate Uncontrolled (lb/hr)	Emission Rate Controlled (lb/hr)
Hot Base (cooler)	500	0.0100	5.0	5.0
Hot Base	406	0.0123	5.0	5.0
Hot Low	292	0.0171	5.0	5.0
Mild Base (cooler)	516	0.0097	5.0	5.0
Mild Base	430	0.0116	5.0	5.0
Mild Low	305	0.0164	5.0	5.0
Cold Base	511	0.0098	5.0	5.0
Cold Low	337	0.0148	5.0	5.0
Average	412		**5.0**	**5.0**

NOTE: Heat Input based on project design fuel heat content of 1030 MMBtu/SCF

Table 3.1A-15
El Segundo Power Facility Modification
SOx Emissions (Trent Turbine, Each)

Operating Condition	Heat Input (MMBTU/hr)	Short-Term Emission Factor[1] (lb/MMBTU)	Long-Term Emission Factor[1] (lb/MMBTU)	Short-Term		Long-Term	
				Emission Rate Uncontrolled (lb/hr)	Emission Rate Controlled (lb/hr)	Emission Rate Uncontrolled (lb/hr)	Emission Rate Controlled (lb/hr)
Hot Base (cooler)	500	0.00204	0.00068	1.0	1.0	0.3	0.3
Hot Base	406	0.00204	0.00068	0.8	0.8	0.3	0.3
Hot Low	292	0.00204	0.00068	0.6	0.6	0.2	0.2
Mild Base (cooler)	516	0.00204	0.00068	1.1	1.1	0.4	0.4
Mild Base	430	0.00204	0.00068	0.9	0.9	0.3	0.3
Mild Low	305	0.00204	0.00068	0.6	0.6	0.2	0.2
Cold Base	511	0.00204	0.00068	1.1	1.1	0.4	0.4
Cold Low	337	0.00204	0.00068	0.7	0.7	0.2	0.2
Average	412			**0.9**	**0.9**	**0.3**	**0.3**

NOTE: Heat Input based on project design fuel heat content of 1030 MMBtu/SCF

Table 3.1A-16
El Segundo Power Facility Modification
NH_3 Emissions (Trent Turbine, Each)

Operating Condition	Heat Input (MMBTU/hr)	Pollutant Conc. Controlled (ppmvd)	Molecular Weight (lb/lb-mol)	Specific Molar Volume (dscf/lb-mol)	Dry Fuel Factor (dscf/MMBTU)	Emission Factor (lb/MMBTU)	Emission Rate (lb/hr)
Hot Base (cooler)	500	5	17	385.3	8,710	0.0068	3.4
Hot Base	406	5	17	385.3	8,710	0.0068	2.8
Hot Low	292	5	17	385.3	8,710	0.0068	2.0
Mild Base (cooler)	516	5	17	385.3	8,710	0.0068	3.5
Mild Base	430	5	17	385.3	8,710	0.0068	2.9
Mild Low	305	5	17	385.3	8,710	0.0068	2.1
Cold Base	511	5	17	385.3	8,710	0.0068	3.5
Cold Low	337	5	17	385.3	8,710	0.0068	2.3
Average	412						**2.8**

NOTE: Heat Input based on project design fuel heat content of 1030 MMBtu/SCF

Table 3.1A-17
Gas Turbine Daily Mass Emission Rates, lbs/day (Non-Commissioning Year)

	Operating	Maximum Hourly Emission Rate (lbs/hr)						Maximum Daily Emissions (lbs/day)					
Unit 9	**Hours per GT**	**NOx**	**CO**	**VOC**	**SOx**	**PM10**	**NH3**	**NOx**	**CO**	**VOC**	**SOx**	**PM10**	**NH3**
Normal Operations	21	17.9	10.9	6.2	1.7	9.5	16.6	376.9	229.4	131.1	35.5	199.5	348.2
Startup (fast)	1	45.0	158.5	17.1	1.4	9.5	16.6	45.0	158.5	17.1	1.4	9.5	16.6
Startup (trad)	1	62.3	291.0	23.3	1.4	9.5	13.4	62.3	291.0	23.3	1.4	9.5	13.4
Shutdown	2	37.5	322.0	34.6	1.7	9.5	16.6	74.9	643.9	69.2	3.4	19.0	33.2
Total =								559.1	1322.8	240.7	41.6	237.5	411.3
	Operating	**Maximum Hourly Emission Rate (lbs/hr)**						**Maximum Daily Emissions (lbs/day)**					
Unit 11	**Hours per GT**	**NOx**	**CO**	**VOC**	**SOx**	**PM10**	**NH3**	**NOx**	**CO**	**VOC**	**SOx**	**PM10**	**NH3**
Normal Operations	16	4.8	4.6	1.3	0.4	5.0	3.5	76.0	74.0	21.2	5.7	80.0	56.2
Startup	4	30.4	89.8	7.4	0.2	5.0	3.5	121.5	359.3	29.4	0.8	20.0	14.0
Shutdown	4	10.3	63.1	5.6	0.4	5.0	3.5	41.1	252.3	22.3	1.4	20.0	14.0
Total =								238.6	685.6	72.9	8.0	120.0	84.3
	Operating	**Maximum Hourly Emission Rate (lbs/hr)**						**Maximum Daily Emissions (lbs/day)**					
Unit 12	**Hours per GT**	**NOx**	**CO**	**VOC**	**SOx**	**PM10**	**NH3**	**NOx**	**CO**	**VOC**	**SOx**	**PM10**	**NH3**
Normal Operations	16	4.8	4.6	1.3	0.4	5.0	3.5	76.0	74.0	21.2	5.7	80.0	56.2
Startup	4	30.4	89.8	7.4	0.2	5.0	3.5	121.5	359.3	29.4	0.8	20.0	14.0
Shutdown	4	10.3	63.1	5.6	0.4	5.0	3.5	41.1	252.3	22.3	1.4	20.0	14.0
Total =								238.6	685.6	72.9	8.0	120.0	84.3
							Facility Total	1036.2	2694.1	386.5	57.5	477.5	579.9

Note: Based on maximum 1-hour emissions

Table 3.1A-18
El Segundo Power Facility Modification
Monthly Emissions - Non-Commissioning Year

	Hours per Month	CO (lb/hr)	NOx (lb/hr)	VOC (lb/hr)	PM10 (lb/hr)	SOx (lb/hr)	NH3 (lb/hr)	CO (lb/month)	NOX (lb/month)	VOC (lb/month)	PM10 (lb/month)	SOx (lb/month)	NH3 (lb/month)
Unit 9 Start-Up (Fast Start)	47	158.5	45.0	17.1	9.5	1.4	13.4	7,448	2,114	802	447	64	629
Unit 9 Start-Up (Traditional)	15	291.0	62.3	23.3	9.5	1.4	13.4	4,365	934	349	143	20	201
Unit 9 Normal Operations (1)	606	10.9	17.9	6.2	9.5	1.7	16.6	6,620	10,876	3,783	5,757	1,024	10,049
Unit 9 Shutdown	62	322.0	37.5	34.6	9.5	1.7	16.6	19,962	2,323	2,147	589	105	1,028
Unit 9 Totals	**730**							**38,395**	**16,247**	**7,081**	**6,935**	**1,213**	**11,906**
Unit 11 Start-Up	60	89.8	30.4	7.4	5.0	0.2	3.5	5,389	1,823	442	300	12	211
Unit 11 Normal Operations (1)	320	4.6	4.8	1.3	5.0	0.4	3.5	1,481	1,520	423	1,600	115	1,124
Unit 11 Shutdown	60	63.1	10.3	5.6	5.0	0.4	3.5	3,785	616	335	300	21	211
Unit 11 Totals	**440**							**10,655**	**3,959**	**1,200**	**2,200**	**148**	**1,545**
Unit 12 Start-Up	60	89.8	30.4	7.4	5.0	0.2	3.5	5,389	1,823	442	300	12	211
Unit 12 Normal Operations (1)	320	4.6	4.8	1.3	5.0	0.4	3.5	1,481	1,520	423	1,600	115	1,124
Unit 12 Shutdown	60	63.1	10.3	5.6	5.0	0.4	3.5	3,785	616	335	300	21	211
Unit 12 Totals	**440**							**10,655**	**3,959**	**1,200**	**2,200**	**148**	**1,545**
Total Monthly Emissions (lb/month)								**59,704**	**24,165**	**9,480**	**11,335**	**1,510**	**14,996**

Table 3.1A-19
El Segundo Power Facility Modification
Annual Emissions - Non-Commissioning Year

	Hours per Year	CO (lbs/hr)	NOx (lbs/hr)	VOC (lbs/hr)	PM10 (lbs/hr)	SOx (lbs/hr)	NH3 (lbs/hr)	CO (lbs/yr)	NOX (lbs/yr)	VOC (lbs/yr	PM10 (lbs/yr)	SOx (lbs/yr)	NH3 (lbs/yr)
Unit 9 Start-Up (fast)	150	158.5	45.0	17.1	9.5	1.4	13.4	23,769	6,746	2,561	1,425	204	2,007
Unit 9 Start-Up (Traditional)	50	291.0	62.3	23.3	9.5	1.4	13.4	14,550	3,113	1,163	475	68	669
Unit 9 Normal Operations	5,056	10.9	17.9	6.2	9.5	1.7	16.6	55,234	90,742	31,562	48,032	8,544	83,838
Unit 9 Shutdown	200	322.0	37.5	34.6	9.5	1.7	16.6	64,392	7,495	6,924	1,900	338	3,316
Unit 9 Totals	**5,456**							**157,946**	**108,095**	**42,210**	**51,832**	**9,155**	**89,830**
Unit 11 Start-Up	480	89.8	30.4	7.4	5.0	0.2	3.5	43,111	14,580	3,533	2,400	97	1,686
Unit 11 Normal Operations	3,840	4.6	4.8	1.3	5.0	0.4	3.5	17,768	18,244	5,077	19,200	1,374	13,485
Unit 11 Shutdown	480	63.1	10.3	5.6	5.0	0.4	3.5	30,281	4,928	2,679	2,400	172	1,686
Unit 11 Totals	**4,800**							**91,159**	**37,753**	**11,289**	**24,000**	**1,643**	**16,856**
Unit 12 Start-Up	480	89.8	30.4	7.4	5.0	0.2	3.5	43,111	14,580	3,533	2,400	97	1,686
Unit 12 Normal Operations	3,840	4.6	4.8	1.3	5.0	0.4	3.5	17,768	18,244	5,077	19,200	1,374	13,485
Unit 12 Shutdown	480	63.1	10.3	5.6	5.0	0.4	3.5	30,281	4,928	2,679	2,400	172	1,686
Unit 12 Totals	**4,800**							**91,159**	**37,753**	**11,289**	**24,000**	**1,643**	**16,856**
Aux Boiler (25% load)	3,304	0.3	0.1	0.0	0.1	0.0	0.0	1,099	325	119	222	62	0
Aux Boiler (100% load)	33	1.3	0.4	0.1	0.3	0.1	0.0	44	13	5	9	2	0
Aux Boiler Totals	**3,337**							**1,143**	**338**	**124**	**231**	**64**	**0**
Total Annual Emissions (lb/year)								**341,408**	**183,939**	**64,912**	**100,063**	**12,506**	**123,542**
Total Annual Emissions (ton/year)								**170.7**	**92.0**	**32.5**	**50.0**	**6.3**	**61.8**

Table 3.1A-20
El Segundo Power Facility Modification
Greenhouse Gas Emissions

Unit	Rated Capacity, MW	Operating Hours per year	Maximum Fuel Use, MMBtu/yr	Estimated Gross Annual MWh	Maximum Emissions, metric tonnes/yr				Estimated Emissions, metric tonnes/MWh		
					CO2	CH4	N2O	SF6	CO2	CH4	N2O
Unit 9	334	5,456	13,291,520	1,822,304	704,716	13.29	1.33	0.00	0.387	7.29E-06	7.29E-07
Unit 11	58	4,800	2,476,411	278,400	131,299	2.48	0.25	0.00	0.472	8.90E-06	8.90E-07
Unit 12	58	4,800	2,476,411	278,400	131,299	2.48	0.25	0.00	0.472	8.90E-06	8.90E-07
AuxiliaryBoiler	36 MMBH	3,304	118,944	N/A	6,306	0.12	0.01	0.00			
Total	--	--	18,244,342	2,379,104	967,315	18	2	0	0.407	7.67E-06	7.67E-07
CO2eq					967,315	383	566	0			
							TOTAL CO2eq	968,264			

Natural Gas GHG Emission Rates (Note 1)

	Emission Factors, kg/MMBtu			
	CO2 (2)	CH4 (3)	N2O (3)	SF6
Natural Gas	53.020	1.00E-03	1.00E-04	n/a
Global Warming Potential (4)	1	21	310	23,900

Note 1. Calculation methods and emission factors from 40 CFR 98 Subpart C
Note 2. Table C-1
Note 3. Table C-2.
Note 4. Table C-2

Table 3.1A-21
El Segundo Power Facility Modification
Unit 9 Startup, Shutdown, Startup/Shutdown Hourly Emissions (GE Turbine)

Pollutant	Startup Hour (Fast Start) Max. Hour Emissions (lbs/hr)	Startup Hour (Fast Start) Avg. Hour Emissions (lbs/hr)	Startup Hour (Traditional) Max. Hour Emissions (lbs/hr)	Startup Hour (Traditional) Avg. Hour Emissions (lbs/hr)	Shutdown Hour Max. Hour Emissions (lbs/hr)	Shutdown Hour Avg. Hour Emissions (lbs/hr)
CO	158.5	158.5	291.0	291.0	322.0	322.0
NOx	45.0	45.0	62.3	62.3	37.5	37.5
VOC	17.1	17.1	23.3	23.3	34.6	34.6
PM10 (1)	9.5	9.5	9.5	9.5	9.5	9.5
SOx (1) (short-term)	4.1	N/A	4.1	N/A	4.1	N/A
SOx (1) (long-term)	N/A	1.4	N/A	1.4	N/A	1.4
NH3	13.4	13.4	13.4	13.4	13.4	13.4

Note 1. Start-ups/shutdowns do not significantly affect SOx, PM10, or NH3 emissions. Therefore, PM10, SOx, and NH3 during start-up are assumed to be equal to normal operation (average temp. peak load)

Table 3.1A-22
El Segundo Power Facility Modification
Unit 9 CTG Hourly Emissions - Startup/Shutdown Emissions (GE Turbine)

CTG - Hourly Startup Emissions (Fast Start)

	Time (minutes)	NOx Emissions (lbs/hr)	CO Emissions (lbs/hr)	VOC Emissions (lbs/hr)	NOx Emissions (lbs)	CO Emissions (lbs)	VOC Emissions (lbs)
Maximum Startup Emissions	30	N/A	N/A	N/A	36.0	153.0	14.0
Maximum Normal Operation Emissions	30	17.9	10.9	6.2	9.0	5.5	3.1
Total =					45.0	158.5	17.1

CTG - Hourly Startup Emissions (Traditional Start)

	Time (minutes)	NOx Emissions (lbs/hr)	CO Emissions (lbs/hr)	VOC Emissions (lbs/hr)	NOx Emissions (lbs)	CO Emissions (lbs)	VOC Emissions (lbs)
Maximum Startup Emissions	60	N/A	N/A	N/A	62.3	291.0	23.3
Maximum Normal Operation Emissions	0	17.9	10.9	6.2	0.0	0.0	0.0
Total =					62.3	291.0	23.3

CTG - Hourly Shutdown Emissions

	Time (minutes)	NOx Emissions (lbs/hr)	CO Emissions (lbs/hr)	VOC Emissions (lbs/hr)	NOx Emissions (lbs)	CO Emissions (lbs)	VOC Emissions (lbs)
Maximum Shutdown Emissions	30	N/A	N/A	N/A	28.5	316.5	31.5
Maximum Normal Operation Emissions	30	17.9	10.9	6.2	9.0	5.5	3.1
Total =					37.5	322.0	34.6

Table 3.1A-23
El Segundo Power Facility Modification
Unit 11/12 Startup, Shutdown, Startup/Shutdown Hourly Emissions (Trent Turbine) (each)

Pollutant	Startup Hour		Shutdown Hour		Startup/Shutdown Hour	
	Max. Hour Emissions (lbs/hr)	Avg. Hour Emissions (lbs/hr)	Max. Hour Emissions (lbs/hr)	Avg. Hour Emissions (lbs/hr)	Max. Hour Emissions (lbs/hr)	Avg. Hour Emissions (lbs/hr)
CO	89.8	89.8	63.1	63.1	148.3	148.3
NOx	30.4	30.4	10.3	10.3	35.9	35.9
VOC	7.4	7.4	5.6	5.6	11.6	11.6
PM10 (1)	5.0	5.0	5.0	5.0	5.0	5.0
SOx (1) (short-term)	0.4	N/A	0.4	N/A	0.4	N/A
SOx (1) (long-term)	N/A	0.2	N/A	0.2	N/A	0.2
NH3	3.5	3.5	3.5	3.5	3.5	3.5

Note 1. Start-ups/shutdowns do not significantly affect SOx, PM10, or NH3 emissions. Therefore, PM10, SOx, and NH3 during start-up are assumed to be equal to normal operation (average temp. peak)

Table 3.1A-24
El Segundo Power Facility Modification
Unit 11/12 CTG Hourly Emissions - Startup/Shutdown Emissions (Trent Turbine) (each)

CTG - Hourly Startup Emissions (per GT)							
	Time (minutes)	NOx Emissions (lbs/hr)	CO Emissions (lbs/hr)	VOC Emissions (lbs/hr)	NOx Emissions (lbs)	CO Emissions (lbs)	VOC Emissions (lbs)
Maximum Startup Emissions	30	N/A	N/A	N/A	28.0	87.5	6.7
Maximum Normal Operation Emissions	30	4.8	4.6	1.3	2.4	2.3	0.7
Total =					30.4	89.8	7.4

CTG - Hourly Shutdown Emissions (per GT)							
	Time (minutes)	NOx Emissions (lbs/hr)	CO Emissions (lbs/hr)	VOC Emissions (lbs/hr)	NOx Emissions (lbs)	CO Emissions (lbs)	VOC Emissions (lbs)
Maximum Shutdown Emissions	20	N/A	N/A	N/A	7.1	60.0	4.7
Maximum Normal Operation Emissions	40	4.8	4.6	1.3	3.2	3.1	0.9
Total =					10.3	63.1	5.6

CTG - Hourly Startup/Shutdown Emissions (per GT)							
	Time (minutes)	NOx Emissions (lbs/hr)	CO Emissions (lbs/hr)	VOC Emissions (lbs/hr)	NOx Emissions (lbs)	CO Emissions (lbs)	VOC Emissions (lbs)
Maximum Startup Emissions	30	N/A	N/A	N/A	28.0	87.5	6.7
Maximum Shutdown Emissions	20	N/A	N/A	N/A	7.1	60.0	4.7
Maximum Normal Operation Emissions	10	4.8	4.6	1.3	0.8	0.8	0.2
Total =					35.9	148.3	11.6

Table 3.1A-25
El Segundo Power Facility Modification
Annual and Maximum Hourly Non-Criteria Pollutant Emissions For Unit 9

Pollutant	Emission Factor(1) lb/MMBtu	Emission Factor(2) lb/MMscf	Unit 9 Max Firing Rate MMBtu/hr	Natural Gas HHV Btu/scf	Turbine Operating Hours hrs/yr	Unit 9 Max Hourly Firing Rate MMscf/hr	Unit 9 Annual Avg Firing Rate MMscf/yr	Unit 9 Max. Hourly Emissions lbs/hr	Unit 9 Annual Emissions tons/yr	Hourly Emission Rate Per Turbine g/sec	Annual Emission Rate Per Turbine g/sec
Ammonia	(3)	(3)	2,436.1	1,030	5,406	2.37	12,908	1.34E+01	44.91	1.69E+00	1.29E+00
Propylene		7.71E-01	2,436.1	1,030	5,406	2.37	12,908	1.82E+00	4.98	2.30E-01	1.43E-01
Hazardous Air Pollutants											
Acetaldehyde	4.00E-05	4.08E-02	2,436.1	1,030	5,406	2.37	12,908	9.65E-02	0.26	1.22E-02	7.58E-03
Acrolein	6.40E-06	6.53E-03	2,436.1	1,030	5,406	2.37	12,908	1.54E-02	0.04	1.95E-03	1.21E-03
Benzene	1.20E-05	1.22E-02	2,436.1	1,030	5,406	2.37	12,908	2.90E-02	0.08	3.65E-03	2.27E-03
1,3-Butadiene	4.30E-07	4.39E-04	2,436.1	1,030	5,406	2.37	12,908	1.04E-03	0.00	1.31E-04	8.14E-05
Ethylbenzene	3.20E-05	3.26E-02	2,436.1	1,030	5,406	2.37	12,908	7.72E-02	0.21	9.73E-03	6.06E-03
Formaldehyde	3.60E-04	3.67E-01	2,436.1	1,030	5,406	2.37	12,908	8.69E-01	2.37	1.09E-01	6.82E-02
Hexane	--	2.59E-01	2,436.1	1,030	5,406	2.37	12,908	6.13E-01	1.67	7.72E-02	4.81E-02
Naphthalene	1.30E-06	1.33E-03	2,436.1	1,030	5,406	2.37	12,908	3.14E-03	0.01	3.95E-04	2.46E-04
Anthracene	--	3.38E-05	2,436.1	1,030	5,406	2.37	12,908	8.00E-05	0.00	1.01E-05	6.28E-06
Benzo(a)anthracene	--	2.26E-05	2,436.1	1,030	5,406	2.37	12,908	5.35E-05	0.00	6.74E-06	4.20E-06
Benzo(a)pyrene	--	1.39E-05	2,436.1	1,030	5,406	2.37	12,908	3.29E-05	0.00	4.14E-06	2.58E-06
Benzo(b)fluoranthrene	--	1.13E-05	2,436.1	1,030	5,406	2.37	12,908	2.67E-05	0.00	3.37E-06	2.10E-06
Benzo(k)fluoranthrene	--	1.10E-05	2,436.1	1,030	5,406	2.37	12,908	2.60E-05	0.00	3.28E-06	2.04E-06
Chrysene	--	2.52E-05	2,436.1	1,030	5,406	2.37	12,908	5.96E-05	0.00	7.51E-06	4.68E-06
Dibenz(a,h)anthracene	--	2.35E-05	2,436.1	1,030	5,406	2.37	12,908	5.56E-05	0.00	7.01E-06	4.36E-06
Indeno(1,2,3-cd)pyrene	--	2.35E-05	2,436.1	1,030	5,406	2.37	12,908	5.56E-05	0.00	7.01E-06	4.36E-06
Propylene oxide	2.90E-05	2.96E-02	2,436.1	1,030	5,406	2.37	12,908	7.00E-02	0.19	8.82E-03	5.49E-03
Toluene	1.30E-04	1.33E-01	2,436.1	1,030	5,406	2.37	12,908	3.14E-01	0.86	3.95E-02	2.46E-02
Xylene	6.40E-05	6.53E-02	2,436.1	1,030	5,406	2.37	12,908	1.54E-01	0.42	1.95E-02	1.21E-02

Note 1. All factors except PAHs, hexane, and propylene from AP-42, Table 3.1-3, 4/00. Individual PAHs, hexane and propylene are CATEF mean results as AP-42 does not include factors for these compounds.
Note 2. Emission factor converted to lb/MMSCF by multiplying factor in lb/MMBtu by EPA default heating value of 1020 BTU/scf.
Note 3. Based on 5 ppm ammonia slip from SCR system.

Table 3.1A-26
El Segundo Power Facility Modification
Annual and Maximum Hourly Non-Criteria Pollutant Emissions For Units 11/12

Pollutant	Emission Factor(1) lb/MMBtu	Emission Factor(1) lb/MMscf	Unit 11/12 Max Firing Rate MMBtu/hr	Natural Gas HHV Btu/scf	Turbine Operating Hours hrs/yr	Unit 11/12 Max Hourly Firing Rate MMscf/hr	Unit 11/12 Annual Avg Firing Rate MMscf/yr	Unit 11/12 Max. Hourly Emissions lbs/hr (each)	Unit 11/12 Annual Emissions tons/yr (each)	Hourly Emission Rate Per Turbine g/sec (each)	Annual Emission Rate Per Turbine g/sec
Ammonia	(3)	(3)	515.9	1,030	4,800	0.50	2,405	1.99E+00	8.43	2.51E-01	2.42E-01
Propylene		7.71E-01	515.9	1,030	4,800	0.50	2,405	3.86E-01	0.93	4.87E-02	2.67E-02
Hazardous Air Pollutants											
Acetaldehyde	4.00E-05	4.08E-02	515.9	1,030	4,800	0.50	2,405	2.04E-02	0.05	2.58E-03	1.41E-03
Acrolein	6.40E-06	6.53E-03	515.9	1,030	4,800	0.50	2,405	3.27E-03	0.01	4.12E-04	2.26E-04
Benzene	1.20E-05	1.22E-02	515.9	1,030	4,800	0.50	2,405	6.13E-03	0.01	7.73E-04	4.23E-04
1,3-Butadiene	4.30E-07	4.39E-04	515.9	1,030	4,800	0.50	2,405	2.20E-04	0.00	2.77E-05	1.52E-05
Ethylbenzene	3.20E-05	3.26E-02	515.9	1,030	4,800	0.50	2,405	1.64E-02	0.04	2.06E-03	1.13E-03
Formaldehyde	3.60E-04	3.67E-01	515.9	1,030	4,800	0.50	2,405	1.84E-01	0.44	2.32E-02	1.27E-02
Hexane	--	2.59E-01	515.9	1,030	4,800	0.50	2,405	1.30E-01	0.31	1.64E-02	8.96E-03
Naphthalene	1.30E-06	1.33E-03	515.9	1,030	4,800	0.50	2,405	6.64E-04	0.00	8.37E-05	4.59E-05
Anthracene	--	3.38E-05	515.9	1,030	4,800	0.50	2,405	1.69E-05	0.00	2.13E-06	1.17E-06
Benzo(a)anthracene	--	2.26E-05	515.9	1,030	4,800	0.50	2,405	1.13E-05	0.00	1.43E-06	7.82E-07
Benzo(a)pyrene	--	1.39E-05	515.9	1,030	4,800	0.50	2,405	6.96E-06	0.00	8.78E-07	4.81E-07
Benzo(b)fluoranthrene	--	1.13E-05	515.9	1,030	4,800	0.50	2,405	5.66E-06	0.00	7.13E-07	3.91E-07
Benzo(k)fluoranthrene	--	1.10E-05	515.9	1,030	4,800	0.50	2,405	5.51E-06	0.00	6.94E-07	3.81E-07
Chrysene	--	2.52E-05	515.9	1,030	4,800	0.50	2,405	1.26E-05	0.00	1.59E-06	8.72E-07
Dibenz(a,h)anthracene	--	2.35E-05	515.9	1,030	4,800	0.50	2,405	1.18E-05	0.00	1.48E-06	8.13E-07
Indeno(1,2,3-cd)pyrene	--	2.35E-05	515.9	1,030	4,800	0.50	2,405	1.18E-05	0.00	1.48E-06	8.13E-07
Propylene oxide	2.90E-05	2.96E-02	515.9	1,030	4,800	0.50	2,405	1.48E-02	0.04	1.87E-03	1.02E-03
Toluene	1.30E-04	1.33E-01	515.9	1,030	4,800	0.50	2,405	6.64E-02	0.16	8.37E-03	4.59E-03
Xylene	6.40E-05	6.53E-02	515.9	1,030	4,800	0.50	2,405	3.27E-02	0.08	4.12E-03	2.26E-03

Note 1. All factors except PAHs, hexane, and propylene from AP-42, Table 3.1-3, 4/00. Individual PAHs, hexane and proplyene are CATEF mean results as AP-42 does not include factors for these compounds.
Note 2. Emission factor converted to lb/MMSCF by multiplying factor in lb/MMBtu by EPA default heating value of 1020 BTU/scf.
Note 3. Based on 5 ppm ammonia slip from SCR system.

Table 3.1A-27
El Segundo Power Facility Modification
Annual and Maximum Hourly Non-Criteria Pollutant Emissions For Auxiliary Boiler

Pollutant	Emission Factor(1) lb/MMscf	Aux Boiler Max Firing Rate MMBtu/hr	Natural Gas HHV Btu/scf	Turbine Operating Hours hrs/yr	Aux Boiler Max Hourly Firing Rate MMscf/hr	Aux Boiler Annual Avg Firing Rate MMscf/yr	Aux Boiler Max. Hourly Emissions lbs/hr	Aux Boiler Annual Emissions tons/yr	Hourly Emission Rate g/sec	Annual Emission Rate g/sec
Propylene	5.30E-01	36	1,030	8,760	0.03	306	1.85E-02	0.08	2.33E-03	2.33E-03
Hazardous Air Pollutants										
Acetaldehyde	3.10E-03	36	1,030	8,760	0.03	306	1.08E-04	0.00	1.37E-05	1.37E-05
Acrolein	2.70E-03	36	1,030	8,760	0.03	306	9.44E-05	0.00	1.19E-05	1.19E-05
Benzene	5.80E-03	36	1,030	8,760	0.03	306	2.03E-04	0.00	2.55E-05	2.55E-05
Ethylbenzene	6.90E-03	36	1,030	8,760	0.03	306	2.41E-04	0.00	3.04E-05	3.04E-05
Formaldehyde	1.23E-02	36	1,030	8,760	0.03	306	4.30E-04	0.00	5.42E-05	5.42E-05
Hexane	4.60E-03	36	1,030	8,760	0.03	306	1.61E-04	0.00	2.03E-05	2.03E-05
Naphthalene	3.00E-04	36	1,030	8,760	0.03	306	1.05E-05	0.00	1.32E-06	1.32E-06
PAHs (excluding Naphthalene)	4.00E-04	36	1,030	8,760	0.03	306	1.40E-05	0.00	1.76E-06	1.76E-06
Toluene	2.65E-02	36	1,030	8,760	0.03	306	9.26E-04	0.00	1.17E-04	1.17E-04
Xylene	1.97E-02	36	1,030	8,760	0.03	306	6.89E-04	0.00	8.68E-05	8.68E-05

Note 1. From Ventura County APCD AB2588 Combustion Emission Factors (May 17, 2001) natural gas fired external combustion equipment 10-100 MMBtu/Hr.

Table 3.1A-28
Emission Factors

Emission Factors During Non-Commissioning Period									
Operating Condition 3	**Hours per Year**	**Hourly Fuel Use (MMBtu/hr)**	**Natural Gas HHV (Btu/scf)**	**Fuel Use (MMscf/yr)**	**CO (lbs/year)**	**NOX (lbs/year)**	**VOC (lbs/year)**	**PM10 (lbs/year)**	**SOx (lbs/year)**
Unit 9 Start-Up (fast)	150	1,257	1,030	183	23,769	6,746	2,561	1,425	204
Unit 9 Start-Up (traditional)	50	1,257	1,030	61	14,550	3,113	1,163	475	68
Unit 9 Normal Operations	5,056	2,055	1,030	10,089	55,234	90,742	31,562	48,032	8,544
Unit 9 Shutdown	200	1,257	1,030	244	64,392	7,495	6,924	1,900	338
Unit 9 Totals	5,456			10,577	157,946	108,095	42,210	51,832	9,155
Unit 11 Start-Up	480	516	1,030	240	43,111	14,580	3,533	2,400	97
Unit 11 Normal Operations	3,840	516	1,030	1,924	17,768	18,244	5,077	19,200	1,374
Unit 11 Shutdown	480	516	1,030	240	30,281	4,928	2,679	2,400	172
Unit 11 Totals	4,800			2,405	91,159	37,753	11,289	24,000	1,643
Unit 12 Start-Up	480	516	1,030	240	43,111	14,580	3,533	2,400	97
Unit 12 Normal Operations	3,840	516	1,030	1,924	17,768	18,244	5,077	19,200	1,374
Unit 12 Shutdown	480	516	1,030	240	30,281	4,928	2,679	2,400	172
Unit 12 Totals	4,800			2,405	91,159	37,753	11,289	24,000	1,643
Aux Boiler (25% load)	3,304	9	1,030	29	1,099	325	119	222	62
Aux Boiler (100% load)	33	36	1,030	1	44	13	5	9	2
Aux Boiler Totals	3,337			30	1,143	338	124	231	64

	CO	**NOX**	**VOC**	**PM10**	**SOx**
Unit 9					
Annual Emissions (lbs/yr) =	157,946	108,095	42,210	51,832	9,155
Annual Fuel Use (MMscf/yr) =	10,577	10,577	10,577	10,577	10,577
Emission Factor (lbs/MMscf) =	14.93	10.22	3.99	4.90	0.87
Unit 11					
Annual Emissions (lbs/yr) =	91,159	37,753	11,289	24,000	1,643
Annual Fuel Use (MMscf/yr) =	2,405	2,405	2,405	2,405	2,405
Emission Factor (lbs/MMscf) =	37.90	15.70	4.69	9.98	0.68
Unit 12					
Annual Emissions (lbs/yr) =	91,159	37,753	11,289	24,000	1,643
Annual Fuel Use (MMscf/yr) =	2,405	2,405	2,405	2,405	2,405
Emission Factor (lbs/MMscf) =	37.90	15.70	4.69	9.98	0.68
Aux Boiler					
Annual Emissions (lbs/yr) =	1,143	338	124	231	64
Annual Fuel Use (MMscf/yr) =	30	30	30	30	30
Emission Factor (lbs/MMscf) =	38.05	11.25	4.12	7.67	2.14

APPENDIX 3.1B – MODELING SUPPORT DATA

Table 3.1B-1

El Segundo Power Facility Modification
Screening Modeling Inputs
Data For GE Turbine (Unit 9)

Case #	Case	Stack Height meters	Stack Diam meters	Stack flow m3/sec	Stack Vel m/sec	Stack Temp deg K	NOx g/sec	CO g/sec	PM10 g/sec	SOx g/sec
Case 10	Hot Peak	64.008	6.096	596.975	20.451	396.594	2.1552	1.3119	1.1970	0.6088
Case 11	Hot Base (cooler)	64.008	6.096	592.962	20.314	395.928	1.9073	1.1610	1.1970	0.5388
Case 13	Hot Base	64.008	6.096	572.328	19.607	394.317	1.8243	1.1105	1.1970	0.5153
Case 14	Hot Low	64.008	6.096	368.353	12.619	376.428	1.1538	0.7023	1.1970	0.3259
Case 5	Mild Peak	64.008	6.096	596.210	20.425	391.150	2.1885	1.3322	1.1970	0.6182
Case 6	Mild Base (cooler)	64.008	6.096	594.113	20.353	391.594	1.9426	1.1825	1.1970	0.5488
Case 8	Mild Base	64.008	6.096	583.156	19.978	390.706	1.8894	1.1501	1.1970	0.5337
Case 9	Mild Low	64.008	6.096	362.250	12.410	371.261	1.1666	0.7101	1.1970	0.3295
Case 1	Cold Peak	64.008	6.096	583.728	19.997	376.928	2.2614	1.3765	1.1970	0.6388
Case 2	Cold Base	64.008	6.096	592.872	20.311	384.594	2.0124	1.2249	1.1970	0.5684
Case 3	Cold Low	64.008	6.096	365.437	12.519	368.817	1.2241	0.7451	1.1970	0.3458

Table 3.1B-2

El Segundo Power Facility Modification
Screening Modeling Inputs
Data For Trent Turbines (Unit 11 and Unit 12)

Case #	Case	Stack Height meters	Stack Diam meters	Stack flow m3/sec	Stack Vel m/sec	Stack Temp deg K	NOx g/sec	CO g/sec	PM10 g/sec	SOx g/sec
Case 1a	Hot Base (cooler)	45.72	3.38328	326.521659	36.31526375	709.7611111	0.5802895	0.565151548	0.63	0.131134204
Case 1b	Hot Base	45.72	3.38328	284.386978	31.62910589	734.5944444	0.4710548	0.458766451	0.63	0.106449276
Case 2-55%	Hot Low	45.72	3.38328	216.487571	24.07743257	724.4277778	0.3389895	0.330146268	0.63	0.07660506
Case 3a	Mild Base (cooler)	45.72	3.38328	331.222512	36.83808577	704.7611111	0.5986367	0.583020077	0.63	0.135280305
Case 3b	Mild Base	45.72	3.38328	295.874061	32.90668248	725.0944444	0.4987218	0.485711632	0.63	0.112701466
Case 4-55%	Mild Low	45.72	3.38328	222.726475	24.77131448	713.3166667	0.3539693	0.344735359	0.63	0.07999022
Case 5	Cold Base	45.72	3.38328	333.753433	37.11957114	699.0388889	0.5923906	0.576936957	0.63	0.133868816
Case 6-55%	Cold Low	45.72	3.38328	241.949436	26.90926422	664.5388889	0.3913099	0.38110186	0.63	0.088428474

Table 3.1B-3

El Segundo Power Facility Modification
Screening Modeling Impacts (ug/m3)
GE Turbine (Unit 9)

		Nox_1_HR	SO2_1_HR	CO_1_HR	SO2_3_HR	CO_8_HR	SO2_24 HR	PM_24_Hr	NOx_Annual	SO2_Annual	PM_ Annual
Case 10	Hot Peak	2.20	0.62	1.3	0.5	0.9	0.2	0.3116	0.2240	0.0633	0.1244
Case 11	Hot Base (cooler)	1.95	0.55	1.2	0.4	0.8	0.1	0.3137	0.2002	0.0566	0.1257
Case 13	Hot Base	1.90	0.54	1.2	0.4	0.8	0.1	0.3277	0.1998	0.0564	0.1311
Case 14	Hot Low	1.58	0.45	1.0	0.4	0.8	0.2	0.5564	0.2091	0.0591	0.2170
Case 5	Mild Peak	2.25	0.63	1.4	0.5	0.9	0.2	0.3202	0.2345	0.0662	0.1282
Case 6	Mild Base (cooler)	2.00	0.56	1.2	0.5	0.8	0.1	0.3205	0.2083	0.0588	0.1284
Case 8	Mild Base	1.96	0.55	1.2	0.5	0.8	0.1	0.3281	0.2072	0.0585	0.1313
Case 9	Mild Low	1.66	0.47	1.0	0.4	0.8	0.2	0.5849	0.2215	0.0626	0.2273
Case 1	Cold Peak	2.39	0.68	1.5	0.6	1.0	0.2	0.3565	0.2689	0.0759	0.1423
Case 2	Cold Base	2.09	0.59	1.3	0.5	0.9	0.2	0.3345	0.2249	0.0635	0.1338
Case 3	Cold Low	1.75	0.49	1.1	0.5	0.9	0.2	0.5904	0.2344	0.0662	0.2292

Table 3.1B-4

El Segundo Power Facility Modification

Screening Modeling Impacts

Combined Impacts from theTwo Trent Turbines (Unit 11 and Unit 12)

		Nox_1_HR	SO2_1_HR	CO_1_HR	SO2_3_HR	CO_8_HR	SO2_24 HR	PM_24_Hr	NOx_Annual	SO2_Annual	PM_ Annual
Case 1a	Hot Base (cooler)	1.70	0.38	1.65	0.28	0.94	0.086	0.414	0.136	0.033	0.16
Case 1b	Hot Base	1.46	0.33	1.43	0.25	0.85	0.080	0.471	0.134	0.030	0.18
Case 2-55%	Hot Low	1.26	0.29	1.23	0.23	0.78	0.077	0.630	0.127	0.029	0.24
Case 3a	Mild Base (cooler)	1.74	0.39	1.69	0.28	0.96	0.088	0.409	0.148	0.033	0.16
Case 3b	Mild Base	1.52	0.34	1.48	0.26	0.88	0.081	0.455	0.137	0.031	0.17
Case 4-55%	Mild Low	1.30	0.29	1.27	0.24	0.81	0.078	0.618	0.130	0.029	0.23
Case 5	Cold Base	1.72	0.39	1.67	0.28	0.94	0.087	0.408	0.146	0.033	0.16
Case 6-55%	Cold Low	1.39	0.31	1.36	0.25	0.86	0.083	0.593	0.138	0.031	0.22

Table 3.1B-5

El Segundo Power Facility Modification

Stack Parameters and Emission Rates for Refined Modeling

Modeling: Hourly impacts (Unit 9 S/U)

	Case #	Case	Stack Height meters	Stack Diam meters	Stack flow m3/sec	Stack Vel m/sec	Stack Temp deg K	NOx g/sec	CO g/sec	PM10 g/sec	SOx g/sec
Unit 9	SU	Startup	64.0	6.1	362.25	12.410	371.261	10.3038	75.8568	N/A	0.6388
Unit 11	Case 3a	Mild Base (cooler)	45.7	3.4	331.22	36.838	704.761	0.5986	0.5830	N/A	0.1353
Unit 12	Case 3a	Mild Base (cooler)	45.7	3.4	331.22	36.838	704.761	0.5986	0.5830	N/A	0.1353
Boiler	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Modeling: Hourly impacts (Unit 11/12 S/U)

	Case #	Case	Stack Height meters	Stack Diam meters	Stack flow m3/sec	Stack Vel m/sec	Stack Temp deg K	NOx g/sec	CO g/sec	PM10 g/sec	SOx g/sec
Unit 9	Case 1	Cold Peak	64.0	6.1	583.7	19.997	376.928	2.2614	1.3765	N/A	0.6388
Unit 11	SU	Startup	45.7	3.4	241.9	26.909	664.539	4.5224	18.6822	N/A	0.1353
Unit 12	SU	Startup	45.7	3.4	241.9	26.909	664.539	4.5224	18.6822	N/A	0.1353
Boiler	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Modeling: Hourly impacts (All units S/U)

	Case #	Case	Stack Height meters	Stack Diam meters	Stack flow m3/sec	Stack Vel m/sec	Stack Temp deg K	NOx g/sec	CO g/sec	PM10 g/sec	SOx g/sec
Unit 9	SU	Startup	64.0	6.1	362.25	12.410	371.261	10.3038	75.8568	N/A	0.6388
Unit 11	SU	Startup	45.7	3.4	241.9	26.909	664.539	4.5224	18.6822	N/A	0.1353
Unit 12	SU	Startup	45.7	3.4	241.9	26.909	664.539	4.5224	18.6822	N/A	0.1353
Boiler	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Modeling: 3-hour, 8-hour, Daily impacts

	Case #	Case	Stack Height meters	Stack Diam meters	Stack flow m3/sec	Stack Vel m/sec	Stack Temp deg K	NOx g/sec	CO g/sec	PM10 g/sec	SOx g/sec
Unit 9	Case 1	Cold Peak	64.0	6.1	583.7	19.997	376.928	N/A	10.6865	separate	0.6388
Unit 11	Case 3a	Mild Base (cooler)	45.7	3.4	331.2	36.838	704.761	N/A	2.8454	separate	0.1353
Unit 12	Case 3a	Mild Base (cooler)	45.7	3.4	331.2	36.838	704.761	N/A	2.8454	separate	0.1353
Boiler	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	separate	N/A

Table 3.1B5 (cont.)

Modeling: Daily impacts (PM10)

	Case #	Case	Stack Height meters	Stack Diam meters	Stack flow m3/sec	Stack Vel m/sec	Stack Temp deg K	NOx g/sec	CO g/sec	PM10 g/sec	SOx g/sec
Unit 9	Case 3	Cold Low	64.0	6.1	365.4	12.519	368.817	N/A	N/A	1.1970	N/A
Unit 11	Case 2-55%	Hot Low	45.7	3.4	216.5	24.077	724.428	N/A	N/A	0.6300	N/A
Unit 12	Case 2-55%	Hot Low	45.7	3.4	216.5	24.077	724.428	N/A	N/A	0.6300	N/A
Boiler	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Modeling: Annual

	Case #	Case	Stack Height meters	Stack Diam meters	Stack flow m3/sec	Stack Vel m/sec	Stack Temp deg K	NOx g/sec	CO g/sec	PM10 g/sec	SOx g/sec
Unit 9	Case 1	Cold Peak	64.0	6.1	583.7	19.997	376.928	1.5527	N/A	N/A	0.1315
Unit 11	Case 3a	Mild Base (cooler)	45.7	3.4	331.2	36.838	704.761	0.5423	N/A	N/A	0.0236
Unit 12	Case 3a	Mild Base (cooler)	45.7	3.4	331.2	36.838	704.761	0.5423	N/A	N/A	0.0236
Boiler		25% load	15.240	0.610	1.434	4.912	394.261	0.0124	N/A	N/A	0.0084

Modeling: Annual (PM10)

	Case #	Case	Stack Height meters	Stack Diam meters	Stack flow m3/sec	Stack Vel m/sec	Stack Temp deg K	NOx g/sec	CO g/sec	PM10 g/sec	SOx g/sec
Unit 9	Case 3	Cold Low	64.0	6.1	365.4	12.519	368.817	N/A	N/A	0.7441	N/A
Unit 11	Case 2-55%	Hot Low	45.7	3.4	216.5	24.077	724.428	N/A	N/A	0.3499	N/A
Unit 12	Case 2-55%	Hot Low	45.7	3.4	216.5	24.077	724.428	N/A	N/A	0.3499	N/A
Boiler		25% load	15.2	0.6	1.4	4.912	394.261	N/A	N/A	0.0024	N/A

Table 3.1B-6

El Segundo Power Facility Modification
Stack Parameters and Emission Rates for Commissioning Impacts, 1-, 8- and 24-hour averaging periods

	Case #	Case	Stack Height meters	Stack Diam meters	Stack flow m3/sec	Stack Vel m/sec	Stack Temp deg K	NOx g/sec	CO g/sec	PM10 g/sec
Unit 9	Comm	Commissioning	64.0	6.1	362.25	12.410	371.261	25.2158	480.3908	1.1970
Unit 11	Comm	Commissioning	45.7	3.4	241.9	26.909	664.539	12.6252	43.6380	1.3976
Unit 12	Comm	Commissioning	45.7	3.4	241.9	26.909	664.539	12.6252	43.6380	1.3976
Boiler	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Table 3.1B-7

El Segundo Power Facility Modification
Emission Rates and Stack Parameters for Facilitywide Impact Modeling

	Stack Diam, m	Stack Height, m	Temp, deg K	Exhaust Flow, m3/s	Exhaust Velocity, m/s	Emission Rates, g/s			
						NOx	SO2	CO	PM10
Averaging Period: One hour NOx									
Unit 5	6.1	64.0	441	415.5	14.2	1.0573	n/a	n/a	n/a
Unit 7	6.1	64.0	441	415.5	14.2	1.0573	n/a	n/a	n/a
Averaging Period: One hour CO and SOx									
Unit 5	6.1	64.0	441	415.5	14.2	n/a	0.2992	0.9654	n/a
Unit 7	6.1	64.0	441	415.5	14.2	n/a	0.2992	0.9654	n/a
Averaging Period: Three hours SOx									
Unit 5	6.1	64.0	441	415.5	14.2	n/a	0.2992	n/a	n/a
Unit 7	6.1	64.0	441	415.5	14.2	n/a	0.2992	n/a	n/a
Averaging Period: Eight hours CO									
Unit 5	6.1	64.0	441	415.5	14.2	n/a	n/a	0.9654	n/a
Unit 7	6.1	64.0	441	415.5	14.2	n/a	n/a	0.9654	n/a
Averaging Period: 24-hour SOx									
Unit 5	6.1	64.0	441	415.5	14.2	n/a	0.2992	n/a	n/a
Unit 7	6.1	64.0	441	415.5	14.2	n/a	0.2992	n/a	n/a
Averaging Period: 24-hour PM10									
Unit 5	6.1	64.0	441	415.5	14.2	n/a	n/a	n/a	1.2600
Unit 7	6.1	64.0	441	415.5	14.2	n/a	n/a	n/a	1.2600
Averaging Period: Annual NOx and SOx									
Unit 5	6.1	64.0	441	415.5	14.2	1.3085	0.1070	n/a	n/a
Unit 7	6.1	64.0	441	415.5	14.2	1.3085	0.1070	n/a	n/a
Averaging Period: Annual PM10									
Unit 5	6.1	64.0	441	415.5	14.2	n/a	n/a	n/a	0.7455
Unit 7	6.1	64.0	441	415.5	14.2	n/a	n/a	n/a	0.7455

Table 3.1B-8

El Segundo Power Facility Modification
Startup/Shutdown Inputs for Facilitywide Impact Modeling (Units 5 and 7)
Data For Each Turbine

Operating Case	Stack Height meters	Stack Diam meters	Stack flow m3/sec	Stack Vel m/sec	Stack Temp deg K
Startup/Shutdown	64	6.1	415.55	14.24	440.93

Operating Case	NOx g/sec	CO g/sec
Startup/Shutdown	11.48	103.73

APPENDIX 3.1C – MODELING PROTOCOL

Air Dispersion Modeling and Health Risk Assessment Protocol

El Segundo Energy Center – Facility Modification

El Segundo, California

Submitted to:

South Coast Air Quality Management District (for an Application for Permit to Construct/Permit to Operate)

California Energy Commission (for a Petition to Amend)

prepared for:

NRG West

November 2012

prepared by:

Sierra Research, Inc.
1801 J Street
Sacramento, California 95811
(916) 444-6666

Air Dispersion Modeling and Health Risk Assessment Protocol
El Segundo Energy Center – Facility Modification
El Segundo, California

Submitted to:

South Coast Air Quality Management District
(for an Application for Permit to Construct/Permit to Operate)

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Air Dispersion Modeling and Health Risk Assessment Protocol
El Segundo Energy Center – Facility Modification

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1. INTRODUCTION

This protocol describes the modeling procedures that will be used to determine the ambient air impacts from the El Segundo Energy Center – Facility Modification (also referred to herein as the Project). These procedures will be used in the ambient air quality impact assessment and screening health risk assessment that will be submitted to the South Coast Air Quality Management District (SCAQMD, or District) as part of an application for Determination of Compliance and Permit to Construct and to the California Energy Commission as part of a Petition to Amend.

###

2. FACILITY DESCRIPTION AND SOURCE INFORMATION

The El Segundo Energy Center – Facility Modification will replace the existing Unit 3 and 4 steam boiler plants with approximately 440 MW of new natural-gas fired turbine capacity at the existing El Segundo Generating Station. The new gas turbine capacity will include both a fast-start combined cycle unit and two advanced simple cycle units[1], and will provide black-start capability for the entire Generating Station. The El Segundo Generating Station is located at 301 Vista Del Mar, El Segundo, California, situated approximately 2.5 miles southwest of the Los Angeles International Airport and west of the San Diego Freeway (I-405) on the eastern shore of Santa Monica Bay. The power plant site is bordered by Vista Del Mar and the Chevron refinery to the east, 45th Street in the City of Manhattan Beach on the south, Santa Monica Bay on the west, and Chevron Marine Terminal on the north. The facility site is approximately 33 acres in size. Figure 1 shows the general location of the power plant. Figure 2 shows the immediate vicinity of the El Segundo Generating Station.

New emissions units will include a black start Diesel generator and a supplemental cooling system,[2] in addition to the gas turbines described above. The new generating units will be fitted with Best Available Control Technology (BACT). For the gas turbines, BACT will include dry low-NOx combustors, selective catalytic reduction (SCR), an oxidation catalyst, and use of clean-burning natural gas fuel. The operating schedule of the new generating units will vary and may range from no operation during the winter months to potentially full-time operation (24 hours per day, 7 days per week) during the summer months. The modeling analysis will be performed for the worst-case (maximum expected equipment operation) operating hour, operating day, and operating year. The modeling analysis will include a complete description of the new equipment including the worst-case hourly, daily, and annual operating schedules used for the analysis.

Because of the relatively low applicability threshold for GHG emissions under the Prevention of Significant Deterioration (PSD) program, the proposed Project may be subject to PSD review for NO_2, CO, and GHG emissions. The SCAQMD permit application will address applicable PSD modeling requirements based on the final determination of PSD applicability in the application documents.[3]

[1] The fast-start combined cycle combustion turbine/steam turbine will be referred to as Units 9 and 10 and the two advanced simple cycle units referred to as Units 11 and 12.
[2] Primary cooling for the gas turbines will be provided by an air-cooled condenser.
[3] While the SCAQMD has received delegation from EPA to implement PSD permitting for criteria air pollutants, the delegation does not yet extend to GHG. Therefore, a separate PSD permit application for GHG will need to be submitted to EPA Region 9 unless the GHG permit delegation process is completed before the permit application for the Project is filed with the SCAQMD.

Figure 1
Location of the El Segundo Generating Station

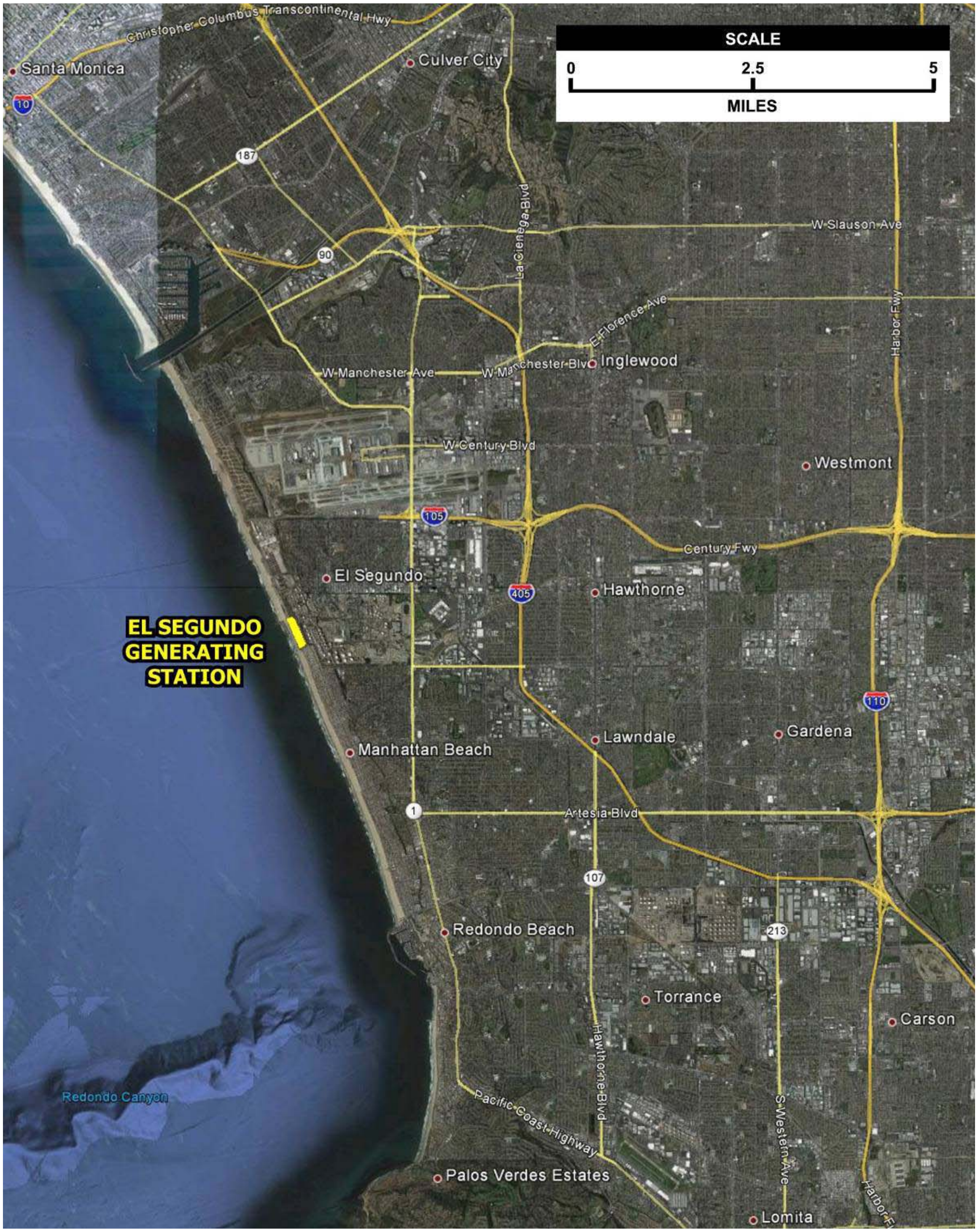

Figure 2
Immediate Vicinity of the El Segundo Generating Station
and General Location of the Project

3. DISPERSION MODEL PROCEDURES

The air quality modeling analysis will follow the March 2009 U.S. Environmental Protection Agency (USEPA) AERMOD Implementation Guide, USEPA's "Guideline on Air Quality Models," and the South Coast Air Quality Management District's (SCAQMD's) "Guidance for Air Dispersion Modeling."[4]

3.1 AERMOD Modeling

The following USEPA air dispersion models are proposed for use to quantify pollutant impacts on the surrounding environment based on the emission sources' operating parameters and their locations:

- American Meteorological Society/Environmental Protection Agency Regulatory Model Improvement Committee (AERMIC) model, also known as AERMOD (Version 12060);

- Building Profile Input Program – Plume Rise Model Enhancements (BPIP-PRIME, Version 04274); and

- SCREEN3 (Version 96043).

The main air dispersion modeling will be conducted with the latest version (Version 12060) of AERMOD, USEPA's preferred/recommended dispersion model for new source review and PSD air quality impact assessments. AERMOD can account for building downwash effects on dispersing plumes. Stack locations and heights and building locations and dimensions will be input to BPIP-PRIME. The first part of BPIP-PRIME determines and reports on whether a stack is being subjected to wake effects from a structure or structures. The second part calculates direction-specific building dimensions for each structure, which are used by AERMOD to evaluate wake effects. The BPIP-PRIME output is formatted for use in AERMOD input files.

AERMOD requires hourly meteorological data consisting of wind direction and speed (with reference height), temperature (with reference height), Monin-Obukhov length, surface roughness length, heights of the mechanically and convectively generated boundary layers, surface friction velocity, convective velocity scale, and vertical potential temperature gradient in the 500-meter layer above the planetary boundary layer.

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[4] *http://www.aqmd.gov/smog/metdata/AERMOD_ModelingGuidance.html*.

Standard AERMOD control parameters will be used, including stack tip downwash, non-screening mode, non-flat terrain, and sequential meteorological data check. The stack-tip downwash algorithm will be used to adjust the effective stack height downward following the methods of Briggs (1972) for cases where the stack exit velocity is less than 1.5 times the wind speed at stack top. The urban option will be used by invoking the URBANOPT option, based on the project's urban location.[5]

If more detailed evaluation of impacts at receptors in terrain above stack-top height is required, the screening version of the USEPA guideline Complex Terrain Dispersion Model PLUS (CTDMPLUS)—Complex Terrain Screening Model (CTSCREEN)—would be used. The CTSCREEN model is discussed in more detail in Appendix A.

3.1.1 Ambient Ratio Method and Ozone Limiting Method

Annual NO_2 concentrations will be calculated using the Ambient Ratio Method (ARM), adopted in Supplement C to the Guideline on Air Quality Models (USEPA, 1995). The Guideline allows a nationwide default of 75% for the conversion of nitric oxide (NO) to NO_2 on an annual basis and the calculation of NO_2/NOx ratios.

If NO_2 concentrations need to be examined in more detail, the Ozone Limiting Method (OLM) (Cole and Summerhays, 1979), implemented through the "OLMGROUP ALL" option in AERMOD (USEPA, 2011a), will be used. AERMOD OLM will be used to calculate the NO_2 concentration based on the OLM method and hourly ozone data. Contemporaneous hourly ozone data collected at the nearby LAX monitoring station will be used in conjunction with OLM to calculate hourly NO_2 concentrations from modeled hourly NOx concentrations.

Part of the NOx in the exhaust is converted to NO_2 during and immediately after combustion. The remaining percentage of the NOx emissions is assumed to be NO. We will use EPA's new NO_2/NOx In-Stack Ratio (ISR) database,[6] released on August 30, 2012, to determine the ISRs to be used in this analysis (see Appendix B).

As the exhaust leaves the stack and mixes with the ambient air, the NO reacts with ambient ozone (O_3) to form NO_2 and molecular oxygen (O_2). The OLM assumes that at any given receptor location, the amount of NO that is converted to NO_2 by this oxidation reaction is proportional to the ambient O_3 concentration. If the O_3 concentration is less than the NO concentration, the amount of NO_2 formed by this reaction is limited. However, if the O_3 concentration is greater than or equal to the NO concentration, all of the NO is assumed to be converted to NO_2.

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[5] The rural vs. urban option in AERMOD is primarily designed to set the fraction of incident heat flux that is transferred into the atmosphere. This fraction becomes important in urban areas having an appreciable "urban heat island" effect due to a large presence of land covered by concrete, asphalt, and buildings. Land use within 3 kilometers [km] of the facility is primarily classified as urban based on the Auer Method; therefore, AERMOD will be run in the "Urban" dispersion mode with a population input of 9,862,049, as defined for Los Angeles County in the District's modeling guidance.

[6] EPA NO_2 / NOx In-Stack Ratio (ISR) Data Base, *http://www.epa.gov/ttn/scram/no2_isr_database.htm*.

A detailed discussion of OLM modeling and how OLM modeling results and monitored background NO_2 will be combined is provided in Sections 3.6.1.3 and 3.6.1.4.

3.1.2 $PM_{2.5}$

$PM_{2.5}$ impacts will be modeled in accordance with USEPA guidance (USEPA, 2010a). A detailed discussion of how modeled $PM_{2.5}$ impacts will be evaluated is provided in Section 3.7.

3.2 Fumigation Modeling

The SCREEN3 model will be used to evaluate inversion breakup fumigation and shoreline fumigation impacts for short-term averaging periods (24 hours or less), as appropriate. The methodology in "Screening Procedures for Estimating the Air Quality Impact of Stationary Sources, Revised" (USEPA, 1992b) will be followed for these analyses. Combined impacts for all sources under fumigation conditions will be evaluated, based on USEPA modeling guidelines.

3.3 Health Risk Modeling

A health risk assessment (HRA) will be performed according to California Air Resources Board (CARB) guidance and SCAQMD's Risk Assessment Procedures for Rule 1401 and 212. The HRA modeling will be prepared using CARB's Hotspots Analysis and Reporting Program (HARP) computer program (Version 1.4f, May 2012) and AERMOD with the CARB "on-ramp."[7] HARP will be used to assess cancer risk as well as non-cancer chronic and acute health hazards. Listed below are the risk assessment options that will be exercised in the modeling, in accordance with the SCAQMD's Risk Assessment Procedures.

- *Deposition velocity – 0.02 m/sec*
- *Fraction of homegrown fruits and vegetables consumed – 5.2%*
- *For noncancer chronic risk estimates, the "Derived (OEHHA)" risk analysis method is used. In this approach, the two dominant (driving) exposure pathways use the high-end point-estimates of exposure, while the remaining exposure pathways use average point estimates.*
- *For cancer risk estimates, the "Derived (Adjusted)" risk analysis method is used. This method is identical to the "Derived (OEHHA)" method discussed above with one exception. The "Derived (Adjusted)" method uses the breathing rate at the 80th percentile of exposure rather than the high-end point-estimate when the inhalation pathway is one of the dominant exposure pathways.*

[7] HARP has not yet been revised to utilize AERMOD, but CARB has developed "on-ramp" software that allows HARP to incorporate AERMOD output files. Therefore, HARP is now compatible with AERMOD.

- *The cancer risk estimates, including the Derived equations (both OEHHA and Adjusted), are based on 70-year exposures.*
- *Pathways considered for residential exposure include inhalation, soil ingestion, dermal absorption, homegrown produce, and mother's milk.*
- *Pathways considered for worker exposure include inhalation, soil ingestion, and dermal absorption.*

3.4 Meteorological Data

The District has provided a five-year meteorological dataset (2005–2009) already processed in AERMET to generate AERMOD-compatible meteorological data for air dispersion modeling. The surface meteorological data were recorded at the LAX Airport, and the upper air data were recorded at the San Diego Miramar Station (No. 03190). Figure 3 below shows the relative locations of the project site and the meteorological monitoring station at LAX. Quarterly and annual composite wind roses for the 2005–2009 LAX meteorological dataset are included as Appendix C.

EPA defines the term "on-site data" to mean data that would be representative of atmospheric dispersion conditions at the source and at locations where the source may have a significant impact on air quality. Specifically, the meteorological data requirement originates in the Clean Air Act at Section 165(e)(1), which requires an analysis "of the ambient air quality at the proposed site and in areas which may be affected by emissions from such facility for each pollutant subject to regulation under [the Act] which will be emitted from such facility."

This requirement and EPA's guidance on the use of on-site monitoring data are also outlined in the "On-Site Meteorological Program Guidance for Regulatory Modeling Applications" (1987a). The representativeness of the data depends on (a) the proximity of the meteorological monitoring site to the area under consideration, (b) the complexity of the topography of the area, (c) the exposure of the meteorological sensors, and (d) the period of time during which the data are collected.

Representativeness has also been defined in "The Workshop on the Representativeness of Meteorological Observations" (Nappo et. al., 1982) as "the extent to which a set of measurements taken in a space-time domain reflects the actual conditions in the same or different space-time domain taken on a scale appropriate for a specific application." Representativeness is best evaluated when sites are climatologically similar, as are the project site and the LAX meteorological monitoring station. Representativeness has additionally been defined in the PSD Monitoring Guideline (USEPA, 1987b) as data that characterize the air quality for the general area in which the proposed project would be constructed and operated. Because of the close proximity of the LAX meteorological data site to the proposed project site (distance between the two locations is approximately 5 km), the same large-scale topographic features that influence the meteorological data monitoring station also influence the proposed project site in the same manner.

Figure 3
Relative Locations of the Project and Monitoring Stations

3.5 Receptor Grids

Receptor and source base elevations will be determined from USGS National Elevation Dataset (NED) data in the GeoTIFF format at a horizontal resolution of 1 arc-second (approximately 30 meters). All coordinates will be referenced to UTM North American Datum 1983 (NAD83), Zone 11. The AERMOD receptor elevations will be interpolated among the DEM nodes according to standard AERMAP procedure. For determining concentrations in elevated terrain, the AERMAP terrain preprocessor receptor-output (ROU) file option will be chosen.

Cartesian coordinate receptor grids will be used to provide adequate spatial coverage surrounding the project area for assessing ground-level pollution concentrations, to identify the extent of significant impacts, and to identify maximum impact locations. A 250-meter resolution coarse receptor grid will be developed and will extend outwards at least 10 km (or more if necessary to establish the significant impact area).

For the full impact analyses, a nested grid will be developed to fully represent the maximum impact area(s). The receptor grid will be constructed as follows:

1. One row of receptors spaced 25 meters apart along the facility's fence line;
2. Four tiers of receptors spaced 25 meters apart, extending 100 meters from the fence line;
3. Additional tiers of receptors spaced 100 meters apart, extending from 100 meters to 1,000 meters from the fenceline; and
4. Additional tiers of receptors spaced 250 meters apart, out to at least 10 km from the most distant source modeled, not to exceed 50 km from the project site.

Additional refined receptor grids with 25-meter resolution will be placed around the maximum first-high or maximum second-high coarse grid impacts and extended out 1,000 meters in all directions. Concentrations within the facility fenceline will not be calculated.

The Regions to be imported in Geographical Coordinates for the USGS National Elevation Dataset (NED) data are bounded as follows:

- South West corner: UTM Zone 11 (NAD 83) 356,500.0 m, 3,741,600.0 m; and
- North East corner: UTM Zone 11 (NAD 83) 379,800.0 m, 3,764,700.0 m.

3.6 Ambient Air Quality Impact Analyses (AQIA)

Emissions from the proposed Project will result from combustion of fuel in the turbines and black start generator and from the cooling system. These emission sources will be modeled as point sources. The expected emission rates will be based on vendor data and additional conservative assumptions of equipment performance.

The purpose of the ambient air quality impact analysis is to demonstrate compliance with applicable ambient air quality standards. Both USEPA and the District have regulations that prohibit construction of a project that will cause or contribute to violations of applicable standards.

According to EPA, if, for a given pollutant and averaging time, the project's impact is below the Significant Impact Levels (SILs) shown in Table 1, the project's impact is deemed to be *de minimis*, and no further analysis is required. SCAQMD's Rule 1303 includes concentrations of NO_2, CO, and PM_{10} that are considered to be significant changes in air quality concentration for individual permit units. Based on discussions with District staff, if the background monitoring data collected during the past five years show levels below the federal/state air quality standards, there is no need to compare modeled impacts to these SCAQMD significance thresholds. Based on recent monitoring data, PM_{10} is the only pollutant for which the Rule 1303 significance thresholds need to be analyzed in the SCAQMD. Also, the District staff allows these significance thresholds to be analyzed on a permit unit basis. Therefore, if maximum modeled PM_{10} impacts from each permit unit do not exceed the concentrations shown in Table 2, the District will determine that the permit unit's impact is not expected to cause or contribute to an exceedance of the most stringent federal or state PM_{10} AAQS.

However, if the modeled impacts exceed any of the significance thresholds displayed in Tables 1 and 2, [8] the project has the potential to cause or contribute to a violation of the ambient air quality standard at the times and locations where the threshold is exceeded. In that case, the analysis must consider the contribution of other sources to the ambient concentration. If the analysis indicates that there will be a violation of an ambient air quality standard, and the project's impact at the time and place of the violation is significant, then the project may not be approved unless the project's impact is reduced.

Table 1
Significant Impact Levels for Air Quality Impacts in Class II Areas ($\mu g/m^3$)

Pollutant	Averaging Period				
	Annual	24-hour	8-hour	3-hour	1-hour
NO_2	1	--	--	--	7.5[9]
SO_2	1	5	--	25	7.8[9]
CO	--	--	500	--	2000
PM_{10}	1	5	--	--	--
$PM_{2.5}$	0.3	1.2	--	--	--

[8] Table 1 concentrations apply to the entire project; Table 2 concentrations apply to each permit unit.
[9] EPA has not yet defined significance levels (SILs) for one-hour NO_2 and SO_2 impacts. However, EPA has suggested that, until SILs have been promulgated, interim values of 4 ppb (7.5 $\mu g/m^3$) for NO_2 and 3 ppb (7.8 $\mu g/m^3$) for SO_2 may be used (USEPA (2010c); USEPA (2010d)). These values will be used in this analysis as interim SILs.

Table 2 Significant Change in Air Quality Concentration (μg/m^3) SCAQMD Rule 1303					
	Averaging Period				
Pollutant	Annual	24-hour	8-hour	3-hour	1-hour
PM_{10}	1	2.5	--	--	--

An air quality impact analysis is required for certification by the CEC and to support the air quality impact analysis, PSD analysis, and screening health risk assessment that are required by the District. Each agency has its own criteria for preparation of the air quality impact analysis; however, the criteria used by the CEC and the District are similar enough that the same basic analysis, with some variations, will satisfy both.

3.6.1.1 Step 1: Project Impact

The first step in the compliance demonstration is to determine, for each pollutant and averaging period, whether the proposed new equipment for the project has the potential to cause a significant ambient impact at any location, under any operating or meteorological conditions. As indicated in the NSR Workshop Manual,[10] "[i]f the significant net emissions increase from a proposed source would not result in a significant ambient impact anywhere, the application is usually not required to go beyond a preliminary analysis in order to make the necessary showing of compliance for a particular pollutant." The EPA and SCAQMD significance levels for air quality impacts are shown in Tables 1 and 2, respectively. If the maximum modeled impact for any pollutant and averaging period is below the appropriate significance level in both tables, no further analysis is necessary.

Based on the following USEPA (2010e) guidance, no further analysis is necessary for any location where the modeled impacts from the project alone are below the significance thresholds.

> *The primary purpose of the SILs is to identify a level of ambient impact that is sufficiently low relative to the NAAQS or increments that such impact can be considered trivial or de minimis. Hence, the EPA considers a source whose individual impact falls below a SIL to have a de minimis impact on air quality concentrations that already exist. Accordingly, a source that demonstrates that the projected ambient impact of its proposed emissions increase does not exceed the SIL for that pollutant at a location where a NAAQS or increment violation occurs is not considered to cause or contribute to that violation. In the same way, a source with a proposed emissions increase of a particular pollutant that will have a significant impact at some locations is not required to model at distances beyond the point where the impact of its proposed emissions is below the SILs for that*

[10] USEPA (1990), p. C.51.

pollutant. When a proposed source's impact by itself is not considered to be "significant," EPA has long maintained that any further effort on the part of the applicant to complete a cumulative source impact analysis involving other source impacts would only yield information of trivial or no value with respect to the required evaluation of the proposed source or modification.[11]

For $PM_{2.5}$, the highest average of the maximum annual averages and of the 24-hour averages modeled over the five years of meteorological data will be compared with the SILs in Table 1 to determine whether the modeled $PM_{2.5}$ project impacts are significant.[12] For other pollutants, the highest modeled concentrations will be compared with the SILs. For pollutants with modeled project impacts below the significance thresholds, a summary table will show the maximum modeled project impacts plus background concentrations. Although this information is not required by federal modeling guidance, it will be provided as part of the CEQA analysis.

3.6.1.2 Step 2: Project Plus Background

Pollutants/averaging periods that are not screened out in Step 1 are required to undergo a full air quality impact analysis. In Step 2, the ambient impacts of the project are modeled and added to background concentrations. The results are compared to the relevant state and federal ambient standards.

The second step of the compliance demonstration is required to show that the proposed new project, in conjunction with existing sources, will not cause or contribute to a violation of any ambient air quality standard. As discussed in more detail below, the impacts of existing sources are represented by the existing ambient air quality data collected at the monitoring stations shown in Table 2. In accordance with Section 8.2.1 of Appendix W to 40 CFR Part 51,

Background concentrations are an essential part of the total air quality concentration to be considered in determining source impacts. Background air quality includes pollutant concentrations due to: (1) Natural sources; (2) nearby sources other than the one(s) currently under consideration; and (3) unidentified sources. Typically, air quality data should be used to establish background concentrations in the vicinity of the source(s) under consideration.

For the proposed project, the only nearby sources proposed for inclusion are the emission units at El Segundo Generating Station that will be in operation at the time the Project is operational—that is, El Segundo Units 5 and 7. Because these units have not yet commenced operation, they are not reflected in the background data and will be modeled

[11] USEPA (2010e), p. 64891.
[12] USEPA (2010a), p. 6.

separately. The impact of natural sources and unidentified sources will be represented by ambient air quality monitoring data collected at the nearby monitoring stations. In this protocol, these impacts are characterized as part of the "regional background."

If a Step 2 analysis is required, the modeled impacts from all Project sources (and, as discussed in to the preceding paragraph, other El Segundo Generating Station sources) will be added to the representative background concentration for a comparison with the National Ambient Air Quality Standard (NAAQS). In accordance with USEPA guidelines,[13] the highest second-highest modeled concentrations will be used to demonstrate compliance with the short-term federal standards (except for the statistically based federal one-hour NO_2 and SO_2, and 24-hour $PM_{2.5}$, standards) and the highest modeled concentration will be used to demonstrate compliance with the federal annual and all state standards. If the predicted total ground-level concentration is below the state or federal ambient air quality standard for each pollutant and averaging period, no further analysis is required for that pollutant and averaging period.

3.6.1.3 Compliance with Statistically Based Standards

For the one-hour average federal NO_2 standard for the District and CEC analyses, the comparison of impacts with the new federal one-hour standard will be done in accordance with Appendix W of Part 51 of Title 40 of the CFR "Guideline on Air Quality Models" and the tiered process developed by "Modeling Compliance of the Federal 1-Hour NO_2 NAAQS" (CAPCOA guidance document, 2011).[14] Appendix W of Part 51 of Title 40 of the CFR "Guideline on Air Quality Models" has codified three methods that can be used to estimate NO_2 concentration (Tier 1 - Total Conversion, Tier 2 - Ambient Ratio Method or ARM, Tier 3 - Ozone Limiting Method or OLM). According to USEPA guidance,

> *While the limited scope of the available field study data imposes limits on the ability to generalize conclusions regarding model performance, these preliminary results of hourly NO_2 predictions for Palau and New Mexico show generally good performance for the PVMRM and OLM/OLMGROUP ALL options in AERMOD. We believe that these additional model evaluation results lend further credence to the use of these Tier 3 options in AERMOD for estimating hourly NO_2 concentrations, and we recommend that their use should be generally accepted provided some reasonable demonstration can be made of the*

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[13] USEPA (2005), 11.2.3.2 and 11.2.3.3

[14] "This modeling protocol is meant to define the stepwise approach necessary to satisfy the requirements in General Guidance for Implementing the 1-Hour NO_2 National Ambient Air Quality Standard in Prevention of Significant Deterioration Permits, Including an Interim NO_2 Significant Impact Level and the Applicability of Appendix W Modeling Guidance for 1-Hour NO_2 National Ambient Air Quality Standard. Nothing in this protocol should be taken as overriding guidance contained in those two memoranda, or Appendix W of Part 51 of Title 40 of the Code of Federal Regulations (40 CFR 51, Appendix W)." (SJVAPCD, 2010b)

appropriateness of the key inputs for these options, the in-stack NO_2/NOx ratio and the background ozone concentrations.[15]

The in-stack NO_2/NOx ratios will be developed from EPA's new NO_2/NOx In-stack Ratio database.[16] Background ozone concentrations in the project area will be represented by five years of ozone data (2005-2009) collected at LAX concurrently with the meteorological data. The LAX ozone monitor is 5 km from the project and is most representative of the ambient conditions at the project. Based on these facts, we propose to use the Tier 3, "OLMGROUP ALL," option for modeling 1-hour NO_2 concentrations.

For demonstrating compliance with the statistically based federal one-hour NO_2 standard, CAPCOA's 2011 guidance document provides 11 progressively more sophisticated methods for combining modeled NO_2 concentrations with background (or monitored) NO_2. These methods, outlined below, were developed to allow demonstration of compliance using the lowest amount of resources necessary. Each tier is a progressively more sophisticated and comprehensive analysis that reduces the level of conservatism without reducing the level of assurance of compliance.

1. Significant Impact Level (SIL) – no background required
2. Max modeled value + max monitored value
3. Max modeled value + 98th pctl monitored value
4. 8th highest modeled value + max monitored value
5. 8th highest modeled value + 98th pctl monitored value
6. (5 yr avg of 98th pctl modeled value) + max monitored value
7. (5 yr avg of 98th pctl of modeled value) + 98th pctl monitored value
8. 5 yr avg of 98th pctl of (modeled value + monthly hour-of-day – 1st high)
9. 5 yr avg of 98th pctl of (modeled value + seasonal hour-of-day – 3rd high)
10. 5 yr average of 98th pctl of (modeled value + annual hour-of-day - 8th high)
11. Paired-Sum: 5 yr avg of 98th pctl of (modeled value + background)

Applicable definitions are provided below.

- **Significant Impact Level (SIL)** is defined as a de minimis impact level below which a source is presumed not to cause or contribute to an exceedance of a NAAQS (see Table 1 above).

- **Max modeled value** is defined as the maximum concentration predicted by the model at any given receptor in any given year modeled.

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[15] (March, 2011), "Additional Clarification Regarding Application of Appendix W Modeling Guidance for the 1-hour NO2 National Ambient Air Quality Standard," [*http://www.epa.gov/ttn/scram/guidance/clarification/Additional_Clarifications_AppendixW_Hourly-NO2-NAAQS_FINAL_03-01-2011.pdf]* The Plume Volume Molar Ratio Method (PVMRM) is considered by EPA to be a Tier 3 screening method, similar to OLM.

[16] EPA NO2 / NOx In-Stack Ratio (ISR) Data Base, *http://www.epa.gov/ttn/scram/no2_isr_database.htm* See Appendix B.

- **8th highest modeled value** is defined as the highest 8th-highest concentration derived by the model at any given receptor in any given year modeled.

- **5 yr avg of the 98th pctl** is defined as the highest of the average 8th highest (98th percentile) concentrations derived by the model across all receptors based on the length of the meteorological data period or the X years average of 98th percentile of the annual distribution of daily maximum one-hour concentrations across all receptors, where X is the number of years modeled. (In Appendix W, EPA recommends using five years of meteorological data from a representative National Weather Service site or one year of on-site data.)

- **Monthly hour-of-day** is defined as the three-year average of the 1st highest concentrations (Maximum Hourly) for each hour of the day Seasonal Hour-Of-Day is defined as the three-year average of the 3rd highest concentrations for each hour of the day and season

- **Annual hour-of-day** is defined as the three-year average of the 8th highest concentration for each hour of the day

- **Paired-Sum (**5 yr avg of the 98th pctl) is the merging of the modeled concentration with the monitored values paired together by month, day, and hour. The sum of the paired values are then processed to determine the X years average of 98th percentile of the annual distribution of daily maximum one-hour concentrations across all receptors, where X is the number of years modeled.

For the demonstration of compliance with the federal one-hour NO_2 standard, we will perform analyses at as many of the following tiers as are needed to demonstrate compliance with the state and federal ambient air quality standards: Tier 1, Tier 2, Tier 7, Tier 8, Tier 9, Tier 10, and Tier 11. Hourly NO_2 background data (for the same five years of meteorological data used for the modeling, 2005 to 2009) may also be used in order to refine the NAAQS analysis both spatially and temporally. Hourly NO_2 data from LAX monitor station will be acquired. This station is approximately 5 kilometers to the project site. A review of the area around this monitoring station shows that it is surrounded by a number of NOx-emitting facilities, including the proposed facility. Therefore, monitored concentrations at this location are considered to be representative of the project site (i.e., other than the other El Segundo Generating Station sources already discussed, no nearby sources will be explicitly modeled—their impacts are already reflected in the ambient monitoring data). In the event of missing hourly NO_2 data, the missing data procedures described in Section 3.7.1 will be followed to fill in gaps in the hourly NO_2 data.

The demonstration of compliance with the federal one-hour SO_2 standard will follow the same steps, except that it will utilize the 99th percentile predicted one-hour average SO_2 concentrations instead of the 98th percentile.

For the 24-hour average federal $PM_{2.5}$ standard for the District and CEC analyses, the comparison of impacts with the federal 24-hour average standard will be done in accordance with USEPA March 23, 2010 guidance (USEPA, 2010a). This guidance calls for basing the initial determination of compliance with the standard on the five-year average of the highest modeled annual and 24-hour averages, combined with background concentrations based on the form of the standards (the three-year average of the annual $PM_{2.5}$ concentrations and the three-year average of the 98th percentile 24-hour averages).[17] If a more detailed assessment of $PM_{2.5}$ impacts is required, a Tier 2 analysis will be performed. USEPA's March 23, 2010 memo provides minimal guidance regarding this type of more detailed analysis, saying only "a Second Tier modeling analysis may be considered that would involve combining the monitored and modeled $PM_{2.5}$ concentrations on a seasonal or quarterly basis, and re-sorting the total impacts across the year to determine the cumulative design value."[18] As no additional guidance has been provided, such an analysis would be discussed with the District and CEC staff prior to implementation.

3.6.1.4 State One-Hour NO_2 Standard

Compliance with the state one-hour NO_2 standard will be demonstrated using OLM and the paired-sum approach described above, except that the analysis will use highest, rather than 98th percentile, concentrations, consistent with the form of the state standard.

3.7 Background Ambient Air Quality Data

Background ambient air quality data for the project area will be obtained from the monitoring sites most representative of the conditions that exist at the proposed project site. The LAX monitoring station is the nearest station with background data for PM_{10}, NO_2, SO_2, O_3, and CO; the North Long Beach Station is the nearest for $PM_{2.5}$ observations. Modeled concentrations will be added to these representative background concentrations to demonstrate compliance with the CAAQS and NAAQS.

Table 3 shows the monitoring stations we propose to use as they provide the most representative ambient air quality background data. Monitoring station locations are also shown in Figure 3.

Table 3
Representative Background Ambient Air Quality Monitoring Stations

Pollutant(s)	Monitoring Station	Distance to Project Site
Ozone, PM_{10}, SO_2, NO_2, CO	LAX	5 km
$PM_{2.5}$	North Long Beach	24 km

[17] USEPA (2010a), p. 9.
[18] USEPA (2010a), p. 8.

For annual NO_2, 24-hour and annual SO_2, and all PM_{10} and CO averaging periods, the highest values monitored during the 2009-2011 period will be used to represent ambient background concentrations in the project area. The one-hour average NO_2 analyses will be performed as described above. Because the three-hour average statistic for SO_2 is no longer available from the USEPA or CARB's websites, one-hour average SO_2 concentrations will be used to represent three-hour average background concentrations for SO_2. For analyses of federal 24-hour and annual $PM_{2.5}$ impacts, the three-year average of the 98th percentile 24-hour monitored levels for the period between 2007 and 2011 will be used to represent project background because these values correspond to the method used for determining compliance with the federal $PM_{2.5}$ standards and are consistent with the guidance cited above.

3.7.1 Missing Data Protocol

Using the OLM method to model project-generated one-hour NO_2 concentrations requires the use of ambient monitored O_3 concentrations. Because the OLM method uses the ambient ozone concentration for a particular hour to limit the conversion of NO to NO_2, it is important to have ozone concentrations for every hour. It is also important that any missing hourly ozone concentrations be filled in with a value that does not underestimate the ozone concentration for that hour, to avoid underestimating the resulting NO_2 concentration. In addition, computation of total hourly NO_2 concentrations requires use of the ambient monitored hourly NO_2 concentrations from the nearest monitoring station. As is the case for the hourly ozone data, it is important to have a background NO_2 value for every hour that does not underestimate actual background.

As discussed above, background ambient O_3 and NO_2 concentrations for the project area will be obtained from the monitoring station at LAX. While these datasets exceed USEPA's 90% completeness criterion (that is, more than 90% of the data values are present for each month), there are still occasional missing values that must be filled in. To fill in these missing values, we propose to use the methods described in "Chapter 6, Gap Filling for Ozone and NO_2 Datasets, Modeling Compliance of the Federal 1-Hour NO_2 NAAQS" (California Air Pollution Control Officers Association [CAPCOA] guidance document, 2011). The CAPCOA guidance follows the procedure established by USEPA (Atkinson and Lee, 1992) for filling a single hour of missing meteorological data, but uses a somewhat different approach for filling in multi-hour data gaps.

For a single hour, it is widely accepted that the best method of gap filling is the use of a linear interpolation of the hour before and after the missing hour. This method is also known as the mean-before-after. To calculate a concentration for a single missing hour, we propose to add the concentrations for the hour before and after the missing hour and divide the sum by two (CAPCOA guidance, Section 6.1.1; Atkinson and Russell, 1992).

The proposed procedure to be used for filling in multi-hour data gaps is the "Monthly Hourly Concentration, Option 2" gap-filling method from Section 6.1.2.2 of the

CAPCOA guidance. The procedure for multiple hours of missing data is outlined below.[19]

1. For all periods with more than one hour missing, fill the missing hour with the maximum for that hour of day for a 30-day rolling period centered on the hour (i.e., for the 15 preceding days and the 15 succeeding days). Note that the 30-day rolling period will extend into the preceding and succeeding year at the start or end, respectively, of the calendar year.[20]

2. For hours not filled by step 1 (that is, if the data for that hour are missing for the entire 30-day rolling period), fill the missing data with the maximum concentration for the preceding or succeeding hour over the 30-day rolling period.

3. Any hours not filled by steps 1 and 2 are likely periods with more than a month of missing data for all hours. These situations are unlikely, and missing data will be filled on a case-by-case basis, following consultation with District and CEC staff.

4. For NO_2 File Only – Check all filled hours for which the filled concentration is higher than the maximum monitored concentration recorded for that day (for a complete day of missing data, the maximum monitored concentration is considered zero for purposes of this comparison). If the filled concentration is higher than the appropriate nth highest daily maximum monitored concentration for the calendar year for determining compliance with federal 1-hour standard (e.g., for 351 or more days of valid data, the 8th highest daily maximum is the appropriate value), then replace filled concentration with the appropriate nth highest daily maximum for the year to fill that hour. Note: This prevents the filling procedure from changing the nth highest daily maximum for the year.

3.8 Health Risk Assessment

A health risk assessment will be performed according to the Office of Environmental Health Hazard Analysis "Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments" (OEHHA, 2003). The HRA modeling will be prepared using CARB's Hotspots Analysis and Reporting Program (HARP) computer program (Version 1.4f, May 2012). The HARP model will be used to assess cancer risk as well as non-cancer chronic and acute health hazards.

The HARP model incorporates the ISCST3 model previously approved by USEPA. CARB offers a software program that allows AERMOD data to be imported into the HARP model, called HARP On-Ramp. The on-ramp will be used with most recent versions of AERMOD and HARP for the screening risk assessment.

[19] Section 6.1.1.2., option 2, CAPCOA guidance document (2011), available at *http://www.valleyair.org/busind/pto/Tox_Resources/CAPCOANO2GuidanceDocument10-27-11.pdf*.

[20] Data from January 2012 will be used to fill in any missing data at the end of the 2011 calendar year.

3.9 Construction Air Quality Impact Analysis

The potential ambient impacts from air pollutant emissions during the construction of the project will be evaluated by air quality modeling that will account for the construction site location and the surrounding topography; the sources of emissions during construction, including vehicle and equipment exhaust emissions; and fugitive dust.

Types of Emission Sources − Construction of the project can be viewed as three main sequential phases: site preparation; construction of foundations; and installation of the gas turbines and associated equipment. The construction impacts analysis will include a schedule for construction operation activities. Site preparation includes site excavation, excavation of footings and foundations, and backfilling operations.

Fugitive dust emissions from the construction of the project result from the following activities:

- Excavation and grading at the construction site;
- Onsite travel on paved and unpaved roads and across the unpaved construction site;
- Aggregate and soil loading and unloading operations;
- Raw material transfer to and from material stockpiles; and
- Wind erosion of areas disturbed during construction activities.

Engine exhaust will be emitted from the following sources:

- Heavy equipment used for excavation, grading, and construction of onsite structures;
- Water trucks used to control construction dust emissions;
- Diesel- and gasoline-fueled welding machines, generators, air compressors, and water pumps;
- Gasoline-fueled pickup trucks and Diesel-fueled flatbed trucks used onsite to transport workers and materials around the construction site;
- Transport of mechanical and electrical equipment to the project site;
- Transport of rubble and debris from the site to an appropriate landfill; and
- Transport of raw materials to and from stockpiles.

Emissions from a peak activity day will be modeled. Annual average emissions over the construction period will also be calculated and modeled for comparison with annual standards.

Existing Ambient Levels – The background data discussed earlier will be used to represent existing ambient levels for the construction analysis as well as the analysis of the impacts of project operations.

Model Options – The AERMOD "OLMGROUP ALL" option will be used to estimate ambient impacts from construction emissions. The modeling options and meteorological data described above will be used for the modeling analysis. A 20% NO_2/NOx fraction for Diesel construction equipment will be assumed (see Appendix B).

The construction site will be represented as both a set of volume sources and a separate set of area sources in the modeling analysis. Emissions will be divided into three categories: exhaust emissions, mechanically generated fugitive dust emissions, and wind-blown fugitive dust emissions. Exhaust emissions and mechanically generated fugitive dust emissions (e.g., dust from wheels of a scraper) will be modeled as volume sources with a height of 6 meters. Wind-blown fugitive dust emissions, sources at or near the ground that are at ambient temperature and have negligible vertical velocity, will be modeled as area sources with a release height of 0.5 meters.

Combustion Diesel PM_{10} emission impacts from construction equipment will be evaluated to demonstrate that the cancer risk from construction activities will be below ten in one million at all receptors.

For the construction modeling analysis, the receptor grid will begin at the property boundary and will extend approximately one kilometer in all directions. The receptor grid will be laid out as follows:

1. One row of receptors spaced 25 meters apart along the facility's fence line;
2. Four tiers of receptors spaced 25 meters apart, extending 100 meters from the fence line; and
3. Additional tiers of receptors spaced 60 meters apart, extending from 100 meters to 1,000 meters from the fenceline.

3.10 Cumulative Air Quality Impact Analysis

To address CEC requirements, a cumulative air quality modeling impacts analysis of the project's typical operating mode will be performed in combination with other stationary source emissions sources within a six-mile radius that have received construction permits since January 1, 2011, or are in the permitting process. For each criteria pollutant, facilities having an emission increase of less than five tons per year are generally considered to be *de minimis*, and these facilities may be excluded from the cumulative impacts analysis after consultation with the CEC staff. Information on any recently constructed/permitted sources that might be appropriate for a cumulative air quality impact analysis (as defined above) will be requested from the South Coast AQMD.

Upon receipt of sufficient information from the local air agencies to allow air dispersion modeling of the recently constructed/permitted non-project sources to be included in the cumulative air quality impact analysis, AERMOD will be used in a procedure similar to that described earlier in this protocol.

###

4. REPORTING

The results of the criteria pollutant and TAC modeling will be integrated into the application documents, and will include the information listed below.

- Project Description – Site map and site plan along with descriptions of the emitting equipment and air pollution control systems.

- Model Options and Input – Model options, screening and refined source parameters, criteria pollutant and TAC emission rates, meteorological data, and receptor grids used for the modeling analyses.

- Air Dispersion Modeling – Dispersion modeling results will include the following:

  - Plot plan showing emission points, nearby buildings (including dimensions), cross-section lines, property lines, fence lines, roads, and UTM coordinates;
  - A table showing building heights used in the modeling analysis;
  - Summaries of maximum modeled impacts; and
  - Model input and output files, including BPIP-PRIME and meteorological files as well as hourly ozone and NO_2 files used in demonstrating compliance with the 1-hour NO_2 standard, in electronic format on a compact disc, together with a description (README file) of all filenames.

- HRA – The HRA will include the following:

  - Descriptions of the methodology and inputs to the construction and operation AERMOD runs;
  - Tables of TAC emission rates and health impacts;
  - Figures showing sensitive receptor locations; and
  - Model input and output files in electronic format on a compact disc, together with a description (README file) of all filenames.

###

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###

Appendix A

Information on CTSCREEN Model

The CTDMPLUS and CTSCREEN Models

Complex terrain impacts may need to be modeled with more accuracy than that provided by AERMOD. The use of more refined modeling techniques is specifically addressed in USEPA's Appendix W[21] modeling guidance, as follows:

> *Since AERMOD treats dispersion in complex terrain, we have merged sections 4 and 5 of appendix W, as proposed in the April 2000 NPR [Notice of Proposed Rulemaking]. And while AERMOD produces acceptable regulatory design concentrations in complex terrain, it does not replace CTDMPLUS for detailed or receptor-oriented complex terrain analysis, as we have made clear in Guideline section 4.2.2. CTDMPLUS remains available for use in complex terrain. [p. 68225]*
>
> *4.2.2 Refined Analytical Techniques*
> *d. If the modeling application involves a well defined hill or ridge and a detailed dispersion analysis of the spatial pattern of plume impacts is of interest, CTDMPLUS, listed in Appendix A, is available. CTDMPLUS provides greater resolution of concentrations about the contour of the hill feature than does AERMOD through a different plume-terrain interaction algorithm. [p. 68233]*

CTSCREEN is the same basic model as CTDMPLUS, except that meteorological data are handled internally in a simplified manner. As discussed in the CTSCREEN users guide,[22]

> *Since [CTDMPLUS] accounts for the three-dimensional nature of plume and terrain interaction, it requires detailed terrain and meteorological data that are representative of the modeling domain. Although the terrain data may be readily obtained from topographic maps and digitized for use in the CTDMPLUS, the required meteorological data may not be as readily available.*
>
> *Since the meteorological input requirements of the CTDMPLUS can limit its application, the EPA's Complex-Terrain-Modeling, Technology-*

[21] 40 CFR 51 Subpart W, as amended November 9, 2005 at 70 FR 68218, "Revision to the Guideline on Air Quality Models: Adoption of a Preferred General Purpose (Flat and Complex Terrain) Dispersion Model and Other Revisions."
[22] USEPA, EPA-600/8-90-087, "User's Guide to CTDMPLUS: Volume 2. The Screening Mode (CTSCREEN)," October 1990.

Transfer Workgroup developed a methodology to use the advanced techniques of CTDMPLUS in situations where on-site meteorological measurements are limited or unavailable. This approach uses CTDMPLUS in a "screening" mode--actual source and terrain characteristics are modeled with an extensive array of predetermined meteorological conditions.

This CTDMPLUS screening mode (CTSCREEN) serves several purposes in regulatory applications. When meteorological data are unavailable, CTSCREEN can be used to obtain conservative (safely above those of refined models), yet realistic, impact estimates for particular sources.

Therefore, the use of the CTSCREEN version of CTDMPLUS is consistent with USEPA guidance.

Appendix B

Proposed NO_2:NOx Ratios for Modeling Compliance with One-Hour NO_2 Standards

The use of the Tier 3 PVMRM and OLM options in AERMOD requires the specification of an in-stack ratio (ISR) of NO_2/NOx for each NOx emissions source. The October 27, 2011 CAPCOA Guidance Document, titled "Modeling Compliance of The Federal 1-Hour NO_2 NAAQS,"[23] emphasized the importance of these in-stack ratios for the 1-hour NO_2 NAAQS, recommending that in-stack ratios used with either the OLM or PVMRM options be justified based on the specific application.

EPA OAQPS is in the process of creating a database of test results that support in-stack NO_2:NOx ratios for specific source types. As discussed in Section 4.1 of the protocol, we are proposing to use EPA's ISR database for the Project.

EPA's ISR database is at *http://www.epa.gov/ttn/scram/no2_isr_database.htm*. As of October 2012, the file NO2_ISR_database.xlsx, which is to provide the NO_2 ISR data that have been submitted via the formal collection initiated by OAQPS, contained no data. Therefore, we propose to use the data in the file NO2_ISR_alpha_database.xlsx. According to the website, the "alpha" file "contains NO_2 ISR values collected by various Regional, State, and Local air permitting offices prior to the formal collection initiated by OAQPS. While this database contains a large number of entries, none fully satisfy the requirements for the formal collection effort." However, in the absence of data submitted via the formal collection effort, the "alpha" data appear to be the best data available for determining NO_2/NOx ISRs.

Following is a description of the procedures followed to obtain proposed NO_2/NOx ratios from the ISR database for the equipment associated with the Project.

Natural Gas-Fired Gas Turbines

1. Make the spreadsheet sortable; filter "Equipment" for "combustion turbine 7FA+e," "turbine," "CT" and "blank" (blank equipment field included to avoid inadvertently eliminating any records that included data for gas turbines). This results in 112 listings, all of which are from Region 10. Eliminate records for equipment at the "CenterPoint Energy-- Dunn" site, as investigation shows that those units are RICE.
2. Using the "Fuel type" field, eliminate records for Diesel-fueled units.
3. Using the "Equipment make and model" field, eliminate records for Solar Centaur 4400 BHP turbines, since those turbines are much smaller than the turbines to be used for this project.

[23] Available at *http://www.valleyair.org/busind/pto/Tox_Resources/CAPCOANO2GuidanceDocument10-27-11.pdf*.

This leaves 104 records for 12 turbines: nine GE turbines and three Siemens turbines. For these records, the total NOx emissions concentrations range from 3 to 16.2 ppmc and the NO_2/NOx ratio ranges from 1 to about 17%, with an average of 7%. The higher NOx emission rates and higher NO_2/NOx ratios are associated with the Siemens turbine records that also indicate only DLN, and no SCR, NOx emissions control. Eliminating the DLN-only records leaves 41 records, with total NOx emissions ranging from 3.0 to 4.3 ppmc. NO_2/NOx ratios range from 1 to 12%, with an average 1%; 39 of the records have ISRs of less than 1% while 2 of the records have ISRs of approximately 12%.

The CAPCOA 2011 NO_2 guidance recommends a NO_2/NOx ratio of 9.1%. Based on the data described above, we propose to use a NO_2/NOx ratio of 9.1% for the ISR for the gas turbines.

Diesel Generators and Diesel Construction Equipment

1. Sort by fuel to select all Diesel, #2 Diesel, and blank fuel fields to eliminate natural gas, biogas, and waste gas-fueled engines, leaving 146 records.

2. Eliminate records for engines at AEL&P Lemon Creek, which are described as "2-stroke, medium speed engines" as the emergency engines and most construction engines are expected to be 4-stroke.

3. Eliminate any engines equipped with SCR—the engine associated with the Project will be a black start generator so will not have SCR, leaving 119 records. Construction Diesel engines will similarly not have SCR.

4. Eliminate records for engines at Centerpoint Energy Dunn, which are natural gas-fired compressor engines.

5. Eliminate records for water pumps, as water pumps have a different operating profile than the emergency and construction engines for this project.

The remaining 31 records are for marine vessel-mounted engines. Of these, 1 has an oxidation catalyst, 11 records are for Diesel particulate filter (DPF)-equipped engines, and the rest have no controls. The black start generator and the construction equipment associated with the Project are not expected to have oxidation catalysts, but are expected to have emission controls, so only the DPF-equipped engines are used for the analysis.

For the black start engine, we eliminated any tests at loads below 80%, as the engine will operate mainly for testing at or near full load.

The DPF-equipped engines range in size from 250 hp to 2710 kW (3634 hp). The NO_2:NOx ratios range from 0.05 to 0.37, with an average of 0.155. The CAPCOA 2011 NO_2 guidance recommends a NO_2/NOx ratio of 20%. Only one of the engines (two records) in the database has a ratio over 0.2: a 250 hp HPU (hydraulic power unit) engine. Without that engine, the average ratio is about 0.11. We are proposing to use

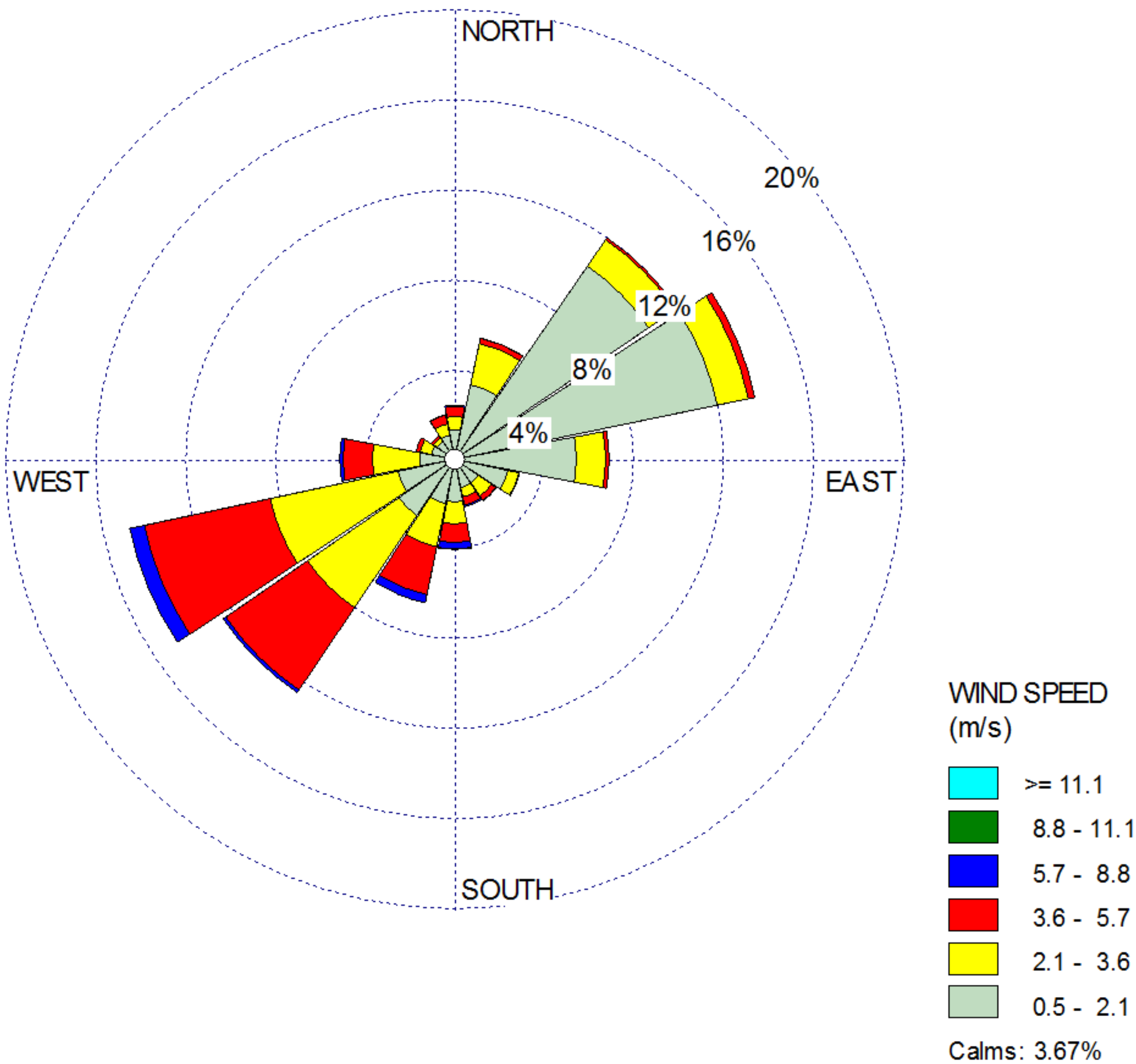
CAPCOA's recommended ratio of 20% as reasonable and conservative for the emergency Diesel generators.

For the construction Diesel engines, we included tests at all loads as those engines often run at lower loads. The NO_2:NOx ratios range from 0.0058 to 0.4694, with an average of 0.11. Consistent with the ratio for the black start generator, we are proposing to use a NO_2:NOx ratio of 20% for the construction equipment.

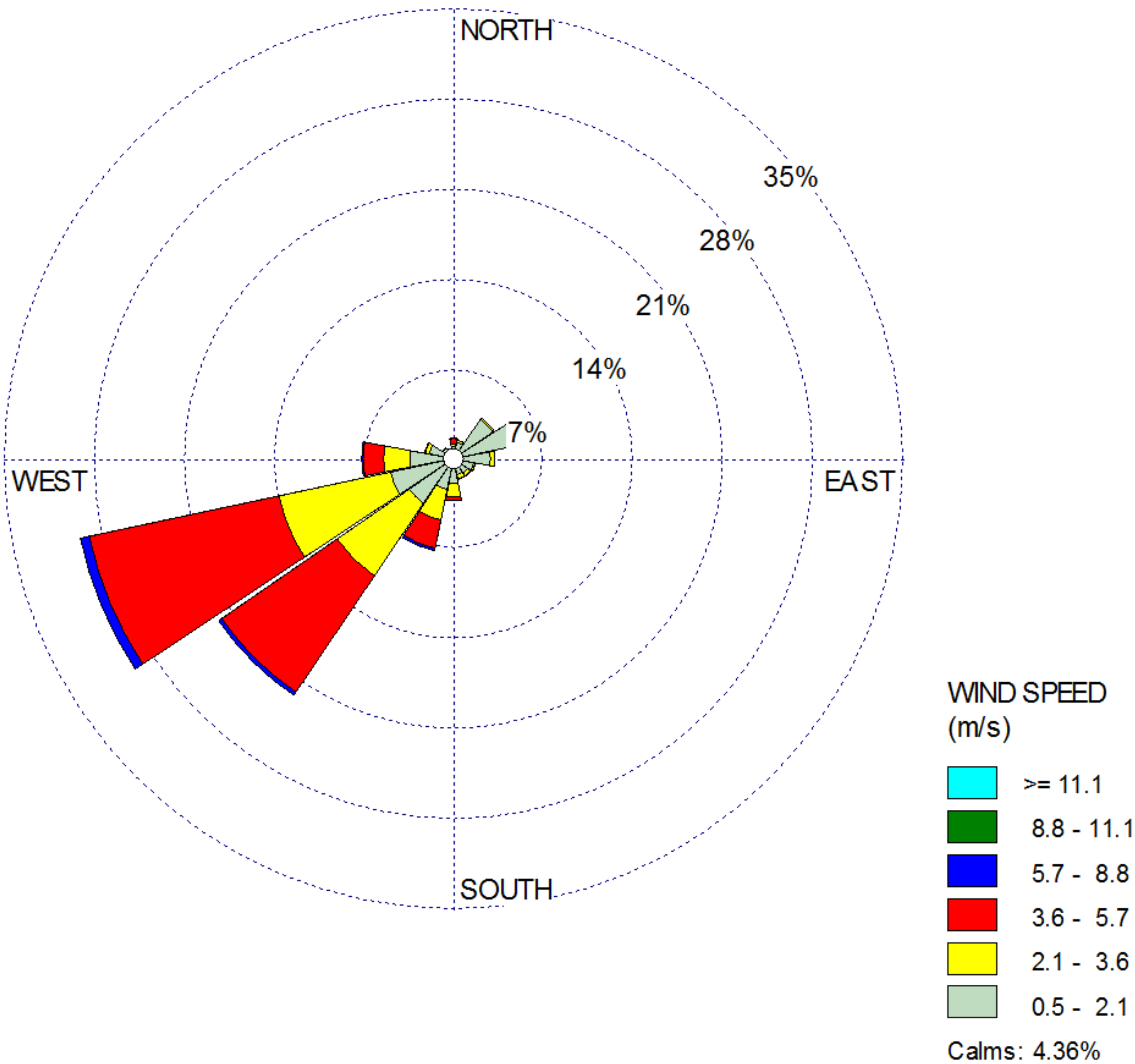
Appendix C

Composite Quarterly and Annual Wind Roses for LAX, CA
2005 – 2009

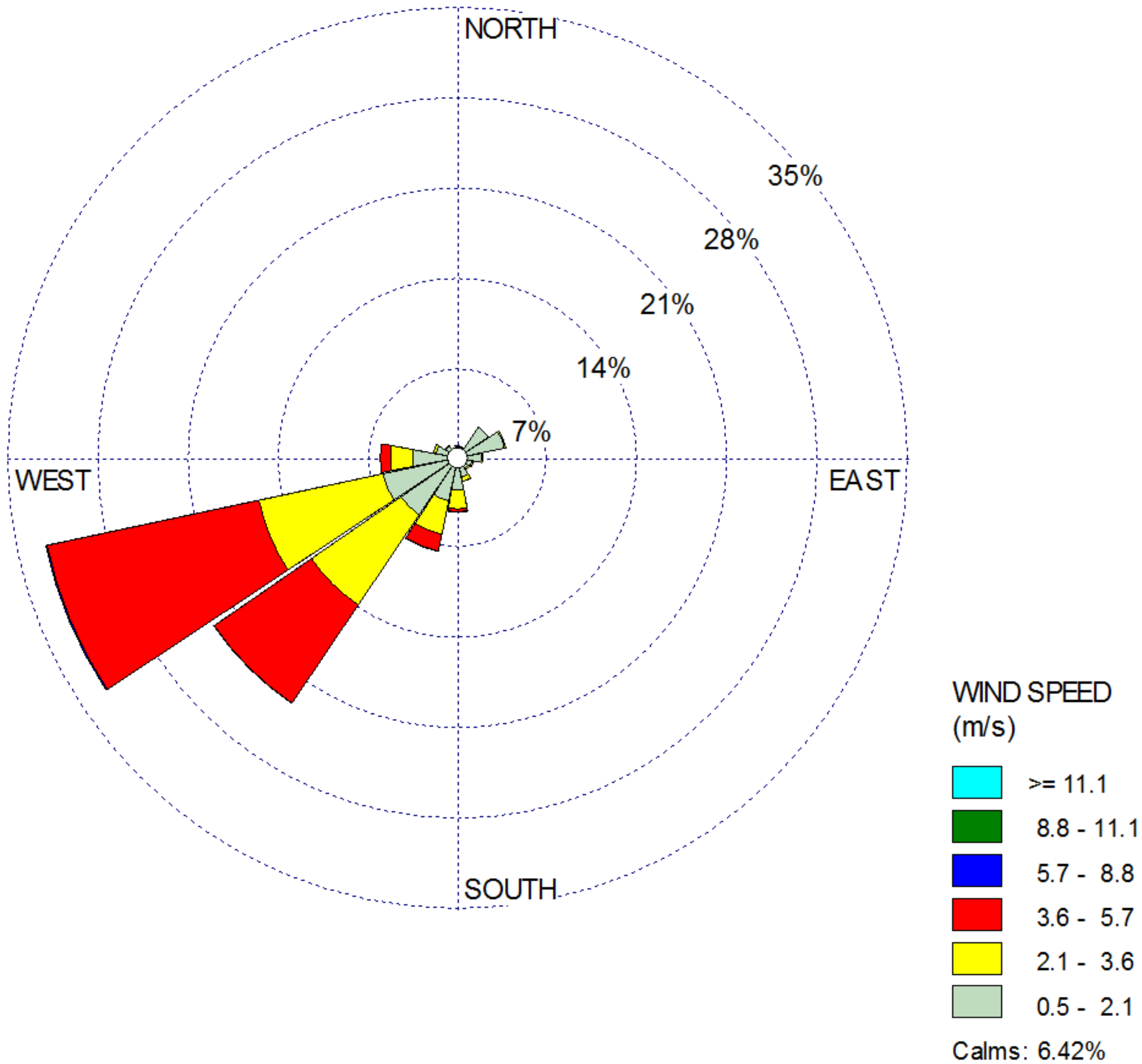
First Quarter, 2005 – 2009



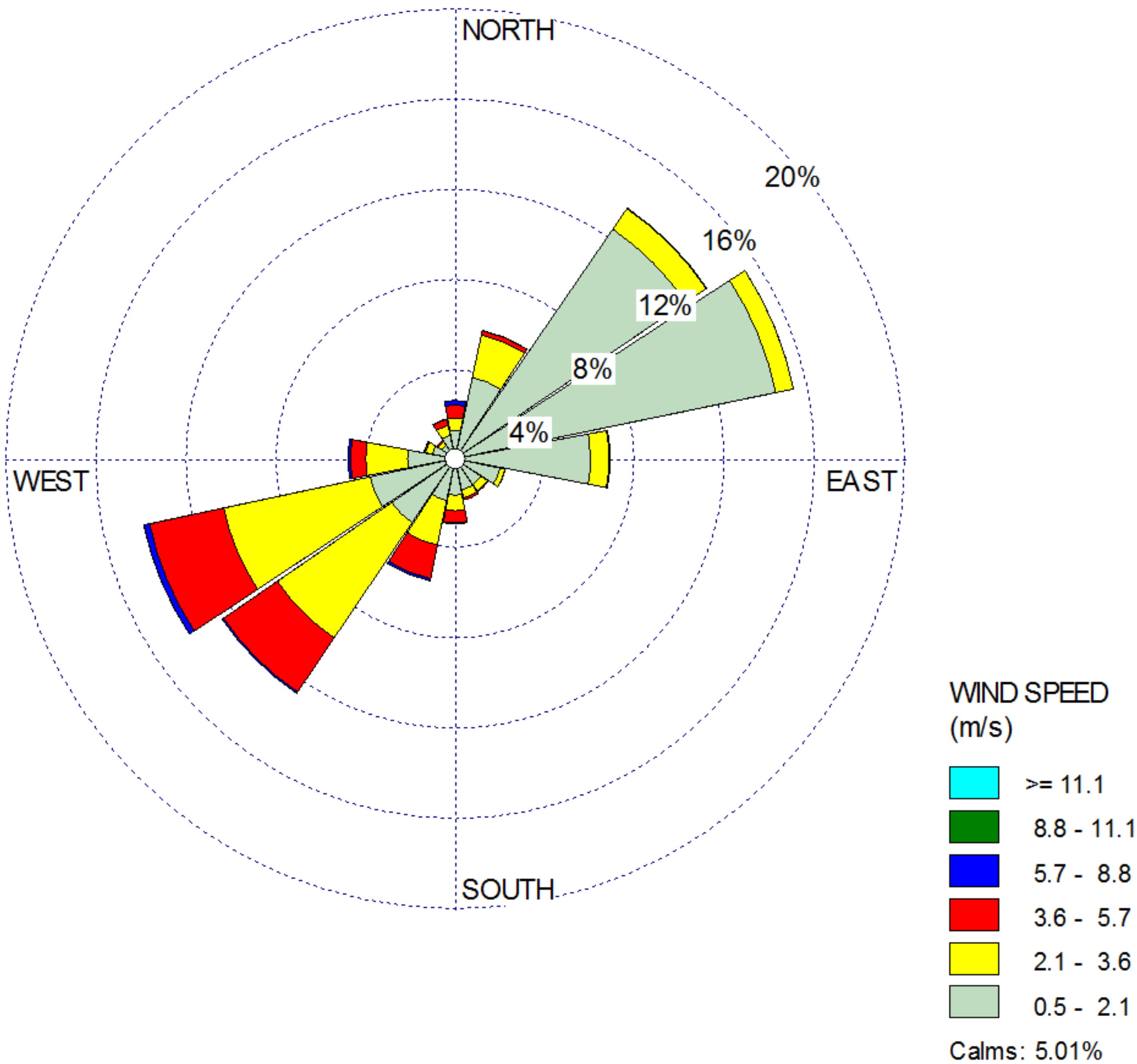
Second Quarter, 2005 – 2009



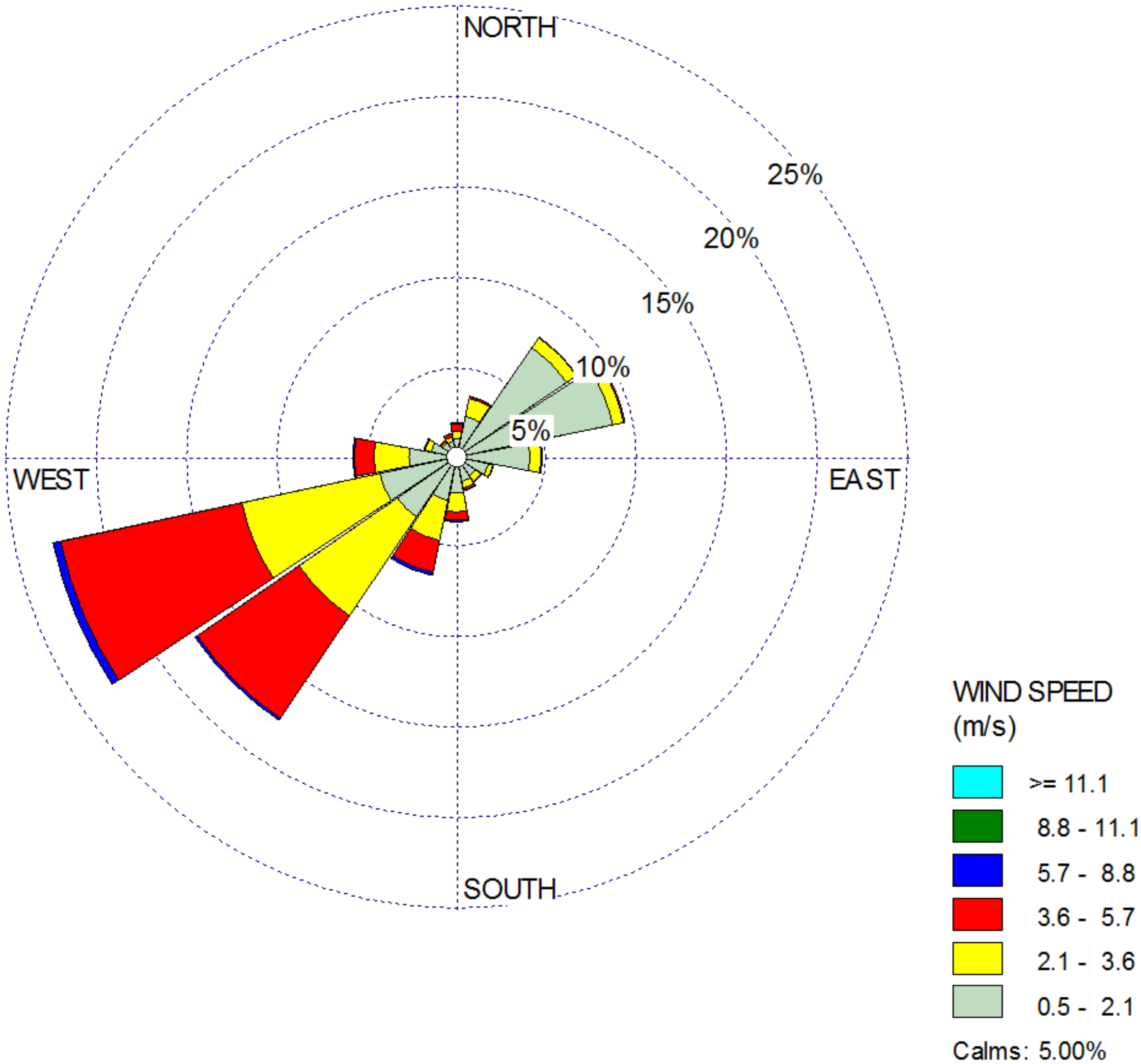
Third Quarter, 2005 – 2009



Fourth Quarter, 2005 – 2009



Annual, 2005 – 2009



APPENDIX 3.1D – CONSTRUCTION EMISSIONS AND SUPPORT DATA

Construction Emissions

Emissions during the construction phase of the project have been estimated, and include an assessment of emissions from vehicle and equipment exhaust and the fugitive dust generated from material handling. A dispersion modeling analysis was conducted based on these emissions. The results of the analysis indicate that construction activities are not expected to cause or contribute to exceedances of state or federal standards for criteria pollutants. The best available emission control techniques will be used to minimize emissions during construction. The project construction impacts are not unusual in comparison to most construction sites; construction sites that use good dust suppression techniques and low-emitting vehicles typically do not cause violations of air quality standards.

The primary emission sources during construction will include exhaust from heavy construction equipment and vehicles, and fugitive dust generated in areas disturbed by grading, excavating, and erection of facility structures. The projected construction schedule has a duration of 20 months, during which different areas within the proposed site and a nearby temporary laydown area will be disturbed. Estimated land disturbance for major construction activities is summarized in Section 2.0, Project Description.

Combustion emissions during construction will result from the following:

- Exhaust from the diesel construction equipment used for site preparation, grading, excavation, trenching, and construction of onsite structures;
- Exhaust from water trucks used to control construction dust emissions;
- Exhaust from portable welding machines;
- Exhaust from pickup trucks and diesel trucks used to transport workers and materials around the construction site;
- Exhaust from diesel trucks used to deliver concrete, fuel, and construction supplies to the construction site including the heavy hauling of major components using truck and/or rail; and
- Exhaust from vehicles used by workers to commute to the construction site.

Fugitive dust emissions from the construction of the project will result from the following:

- Dust entrained during site preparation and grading/excavation at the construction site;
- Dust entrained during onsite travel on paved and unpaved surfaces;
- Dust entrained during aggregate and soil loading and unloading operations; and
- Wind erosion of areas disturbed during construction activities.

To determine the potential worst-case daily construction impacts, exhaust and dust emission rates have been evaluated for each source of emissions. Maximum short-term impacts are calculated based on the equipment mix expected during the second month of the construction schedule. Annual emissions are based on the equipment mix during the peak 12-month period out of the overall construction period.

Available Mitigation Measures

Listed below are typical mitigation measures being proposed to control exhaust emissions from the diesel heavy equipment and potential emissions of fugitive dust during construction of the project.

- Unpaved roads and disturbed areas in the project construction site will be watered as frequently as necessary to prevent fugitive dust plumes. The frequency of watering can be reduced or eliminated during periods of precipitation.
- The vehicle speed limit will be 15 miles per hour within the construction site.
- The construction site entrances shall be posted with visible speed limit signs.
- Construction equipment vehicle tires will be inspected and washed as necessary to be cleaned free of dirt prior to entering paved roadways.
- Gravel ramps of at least 20 feet in length will be provided at the tire washing/cleaning station.
- Unpaved exits from the construction site will be graveled or treated to prevent track-out to public roadways.
- Construction vehicles will enter the construction site through the treated entrance roadways, unless an alternative route has been submitted to and approved by the Compliance Project Manager.
- Construction areas adjacent to any paved roadway will be provided with sandbags or other measures as specified in the Storm Water Pollution Prevention Plan (SWPPP) to prevent run-off to roadways.
- Paved roads within the construction site will be swept at least twice daily (or less during periods of precipitation) on days when construction activity occurs to prevent the accumulation of dirt and debris.
- At least the first 500 feet of any public roadway exiting from the construction site shall be swept at least twice daily (or less during periods of precipitation) on days when construction activity occurs or on any other day when dirt or runoff from the construction site is visible on public roadways.
- Soil storage piles and disturbed areas that remain inactive for longer than 10 days will be covered or treated with appropriate dust suppressant compounds.
- Vehicles used to transport solid bulk material on public roadways and having the potential to cause visible emissions will be provided with a cover, or the materials will be sufficiently wetted and loaded onto the trucks in a manner to provide at least one foot of freeboard.
- Wind erosion control techniques (such as windbreaks, water, chemical dust suppressants, and/or vegetation) will 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.

An on-site Air Quality Construction Mitigation Manager will be responsible for directing and documenting compliance with construction-related mitigation conditions.

Table 3.1D-1
Daily and Annual Construction Emissions

Daily Construction Emissions (peak month) (lbs/day)						
	NOx	CO	VOC	SOx	PM10	PM2.5
Onsite						
Off-Road Equipment	206.44	217.99	32.13	0.41	13.43	13.43
Fugitive Dust					8.95	4.91
Subtotal =	206.44	217.99	32.13	0.41	22.38	18.34
Offsite						
Worker Travel	32.47	295.61	26.17	0.61	2.65	2.45
Truck Emissions	45.91	20.17	3.35	0.08	1.73	1.59
Hauling Deliveries	10.62	5.56	0.97	0.02	0.44	0.40
Worker Travel –Fugitive Dust					74.53	1.10
Truck –Fugitive Dust					2.68	0.07
Hauling –Fugitive Dust					10.92	0.02
Subtotal =	89.00	321.34	30.49	0.71	92.95	5.63
Total =	295.44	539.33	62.62	1.12	115.33	23.97

Peak Annual Construction Emissions (tons/yr, rolling 12-month maximum)						
	NOx	CO	VOC	SOx	PM2.5	PM10
Onsite						
Construction Equipment	19.81	23.47	3.12	0.01	1.50	1.50
Fugitive Dust					0.39	0.19
Subtotal =	19.81	23.47	3.12	0.01	1.89	1.69
Offsite						
Worker Travel	2.65	27.65	2.16	0.02	0.25	0.24
Truck Emissions	4.55	2.13	0.37	0.00	0.01	0.17
Hauling Deliveries	0.94	0.50	0.09	0.00	0.01	0.01
Worker Travel –Fugitive Dust					6.00	0.12
Truck –Fugitive Dust					0.26	0.00
Hauling –Fugitive Dust					0.81	0.00
Subtotal =	8.14	30.28	2.62	0.02	7.34	0.54
Total =	27.95	53.75	5.74	0.03	9.23	2.23

Table 3.1D-2
Modeled Emissions – Short-Term Impacts

Short Term Impacts (24 hours and less)					
	NOx	CO	SOx	PM10	PM2.5
TOTAL					
Off Road Equipment (Combustion) (lbs/day)	206.44	217.99	0.41	13.43	13.43
Off Road Equipment (Combustion) (hrs/day)	16	16	16	16	16
Off Road Equipment (Combustion) (lbs/hr)	12.90	13.62	0.03	0.84	0.84
Off Road Equipment (Combustion) (g/sec)	1.63	1.72	0.00	0.11	0.11
Fugitive Dust (lbs/day)				8.95	4.91
Fugitive Dust (hrs/day)				8	8
Fugitive Dust (lbs/hr)				1.12	0.61
Fugitive Dust (g/sec)				0.14	0.08

Table 3.1D-3
Modeled Emissions – Long-Term Impacts

Long Term Impacts (annual)					
	NOx	CO	SOx	PM10	PM2.5
TOTAL					
Off Road Equipment (Combustion) (tons/yr)	19.81	23.47	0.01	1.50	1.50
Off Road Equipment (Combustion) (days/yr)	269	269	269	269	269
Off Road Equipment (Combustion) (hrs/day)	16	16	16	16	16
Off Road Equipment (Combustion) (lbs/hr)	9.21	10.91	0.00	0.70	0.70
Off Road Equipment (Combustion) (g/sec)	1.16	1.37	0.00	0.09	0.09
Fugitive Dust (tons/yr)				0.39	0.19
Fugitive Dust(days/yr)				269	269
Fugitive Dust (hrs/day)				16	16
Fugitive Dust (lbs/hr)				0.18	0.09
Fugitive Dust (g/sec)				0.02	0.01

Table 3.1D-4
Greenhouse Gas Emission Calculations

Construction GHG Emissions (MT, Total for 20-month Construction Period)				
	CO2	CH4	N2O	CO2e
Off-Road Equipment	5863.51	0.52	0.00	5874.16
Worker Travel	6541.29	0.34	0.00	6548.73
Truck Emissions	964.14	0.00	0.00	964.54
Hauling Emissions	136.88	0.00	0.00	136.97
Total =	13505.82	0.86	0.00	13524.40

Table 3.1D-5
Monthly and Annual Emission Calculations

		2013						2014												2015	
Calendar Month		**July**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**July**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Jan**	**Feb**
Project Month		**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
ROG																					
Off-Road Equipment	(tons/month)	0.07	0.07	0.15	0.42	0.27	0.29	0.26	0.24	0.25	0.26	0.25	0.22	0.23	0.21	0.22	0.20	0.24	0.28	0.35	0.31
Hauling Emission	(tons/month)	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Truck Emission	(tons/month)	0.03	0.04	0.03	0.04	0.04	0.04	0.03	0.03	0.03	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00
Worker Travel	(tons/month)	0.06	0.07	0.06	0.08	0.17	0.16	0.16	0.15	0.15	0.18	0.26	0.18	0.20	0.19	0.19	0.17	0.12	0.13	0.10	0.08
Off-Road Equipment	Rolling 12-month total (tons/year)												2.75	2.91	3.05	3.12	2.90	2.87	2.86	2.95	3.02
Hauling Emission	Rolling 12-month total (tons/year)												0.09	0.08	0.07	0.06	0.05	0.04	0.03	0.02	0.01
Truck Emission	Rolling 12-month total (tons/year)												0.37	0.35	0.32	0.30	0.27	0.24	0.20	0.17	0.14
Worker Travel	Rolling 12-month total (tons/year)												1.68	1.82	1.94	2.07	2.16	2.11	2.08	2.02	1.95
NOx																					
Off-Road Equipment	(tons/month)	0.44	0.46	0.96	2.62	1.75	1.85	1.63	1.52	1.61	1.64	1.58	1.43	1.49	1.31	1.38	1.28	1.55	1.76	2.27	1.90
Hauling Emission	(tons/month)	0.10	0.10	0.10	0.14	0.11	0.11	0.10	0.09	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Truck Emission	(tons/month)	0.34	0.46	0.44	0.52	0.50	0.56	0.38	0.33	0.34	0.24	0.23	0.21	0.18	0.17	0.12	0.11	0.08	0.05	0.03	0.01
Worker Travel	(tons/month)	0.07	0.09	0.08	0.10	0.20	0.20	0.19	0.18	0.19	0.22	0.32	0.23	0.25	0.23	0.23	0.21	0.14	0.16	0.11	0.09
Off-Road Equipment	Rolling 12-month total (tons/year)												17.49	18.54	19.39	19.81	18.47	18.27	18.18	18.82	19.20
Hauling Emission	Rolling 12-month total (tons/year)												0.94	0.84	0.74	0.64	0.50	0.39	0.28	0.18	0.09
Truck Emission	Rolling 12-month total (tons/year)												4.55	4.39	4.10	3.78	3.37	2.95	2.44	2.09	1.77
Worker Travel	Rolling 12-month total (tons/year)												2.07	2.25	2.39	2.54	2.65	2.59	2.55	2.47	2.38
CO																					
Off-Road Equipment	(tons/month)	0.48	0.50	1.04	2.71	1.86	1.98	1.97	1.84	2.01	2.03	1.99	1.82	1.88	1.65	1.73	1.62	1.91	2.16	2.40	2.00
Hauling Emission	(tons/month)	0.05	0.05	0.05	0.07	0.06	0.06	0.06	0.05	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Truck Emission	(tons/month)	0.16	0.21	0.20	0.24	0.23	0.26	0.18	0.16	0.16	0.12	0.11	0.10	0.09	0.08	0.06	0.05	0.04	0.02	0.01	0.01
Worker Travel	(tons/month)	0.71	0.89	0.83	1.07	2.12	2.08	1.99	1.92	1.97	2.26	3.37	2.36	2.56	2.42	2.42	2.18	1.51	1.69	1.21	0.98
Off-Road Equipment	Rolling 12-month total (tons/year)												20.23	21.63	22.78	23.47	22.38	22.43	22.61	23.04	23.20
Hauling Emission	Rolling 12-month total (tons/year)												0.50	0.45	0.40	0.35	0.28	0.22	0.16	0.10	0.05
Truck Emission	Rolling 12-month total (tons/year)												2.13	2.06	1.93	1.79	1.60	1.41	1.17	1.00	0.85
Worker Travel	Rolling 12-month total (tons/year)												21.57	23.42	24.95	26.54	27.65	27.04	26.65	25.87	24.93
SO2																					
Off-Road Equipment	(tons/month)	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling Emission	(tons/month)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Truck Emission	(tons/month)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Travel	(tons/month)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Off-Road Equipment	Rolling 12-month total (tons/year)												0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00
Hauling Emission	Rolling 12-month total (tons/year)												0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Truck Emission	Rolling 12-month total (tons/year)												0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Travel	Rolling 12-month total (tons/year)												0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
PM10																					
Fugitive	(tons/month)	0.01	0.01	0.01	0.12	0.12	0.12														
Fugitive - Hauling	(tons/month)	0.08	0.08	0.07	0.13	0.10	0.10	0.10	0.07	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fugitive - Truck	(tons/month)	0.02	0.03	0.02	0.03	0.03	0.03	0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00
Fugitive - Worker Travel	(tons/month)	0.14	0.18	0.17	0.22	0.43	0.42	0.44	0.42	0.43	0.50	0.74	0.52	0.56	0.53	0.53	0.48	0.33	0.37	0.29	0.23
Fugitive	Rolling 12-month total (tons/year)												0.39	0.38	0.37	0.36	0.24	0.12	0.00	0.00	0.00
Fugitive - Hauling	Rolling 12-month total (tons/year)												0.81	0.73	0.65	0.58	0.45	0.35	0.25	0.15	0.08
Fugitive - Truck	Rolling 12-month total (tons/year)												0.26	0.25	0.23	0.22	0.20	0.18	0.15	0.13	0.11
Fugitive - Worker Travel	Rolling 12-month total (tons/year)												4.61	5.03	5.38	5.74	6.00	5.90	5.85	5.70	5.51
Off-Road Equipment	(tons/month)	0.03	0.03	0.06	0.16	0.12	0.12	0.13	0.12	0.13	0.13	0.13	0.12	0.12	0.11	0.11	0.11	0.12	0.14	0.15	0.12
Hauling Emission	(tons/month)	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Truck Emission	(tons/month)	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Worker Travel	(tons/month)	0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.03	0.02	0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.01
Off-Road Equipment	Rolling 12-month total (tons/year)												1.28	1.37	1.45	1.50	1.45	1.45	1.47	1.49	1.49
Hauling Emission	Rolling 12-month total (tons/year)												0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00
Truck Emission	Rolling 12-month total (tons/year)												0.18	0.18	0.17	0.15	0.13	0.11	0.09	0.07	0.06
Worker Travel	Rolling 12-month total (tons/year)												0.21	0.22	0.23	0.24	0.25	0.24	0.23	0.22	0.21
Hauling Emission PM10	(tons/month)	0.08	0.08	0.07	0.14	0.10	0.10	0.10	0.07	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Truck Emission PM10	(tons/month)	0.03	0.05	0.04	0.05	0.05	0.05	0.04	0.03	0.03	0.03	0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.00	0.00	0.00
Worker Travel PM10	(tons/month)	0.15	0.19	0.18	0.23	0.45	0.44	0.46	0.44	0.45	0.52	0.77	0.54	0.58	0.55	0.55	0.50	0.34	0.38	0.30	0.24
Hauling Emission PM10	Rolling 12-month total (tons/year)												0.82	0.74	0.66	0.59	0.45	0.35	0.25	0.15	0.08
Truck Emission PM10	Rolling 12-month total (tons/year)												0.44	0.43	0.40	0.37	0.33	0.29	0.24	0.20	0.17
Worker Travel PM10	Rolling 12-month total (tons/year)												4.82	5.25	5.61	5.98	6.25	6.14	6.08	5.92	5.72
PM2.5																					
Fugitive	(tons/month)	0.00	0.00	0.00	0.07	0.06	0.06														
Fugitive - Hauling	(tons/month)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fugitive - Truck	(tons/month)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fugitive - Worker Travel	(tons/month)	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00
Fugitive	Rolling 12-month total (tons/year)												0.19	0.19	0.19	0.19	0.12	0.06	0.00	0.00	0.00
Fugitive - Hauling	Rolling 12-month total (tons/year)												0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fugitive - Truck	Rolling 12-month total (tons/year)												0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fugitive - Worker Travel	Rolling 12-month total (tons/year)												0.08	0.09	0.10	0.11	0.12	0.12	0.12	0.11	0.10
Off-Road Equipment	(tons/month)	0.03	0.03	0.06	0.16	0.12	0.12	0.13	0.12	0.13	0.13	0.13	0.12	0.12	0.11	0.11	0.11	0.12	0.14	0.15	0.12
Hauling Emission	(tons/month)	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Truck Emission	(tons/month)	0.01	0.02	0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Worker Travel	(tons/month)	0.01	0.01	0.01	0.01	0.02	0.01	0.02	0.02	0.02	0.02	0.03	0.02	0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.01
Off-Road Equipment	Rolling 12-month total (tons/year)												1.28	1.37	1.45	1.50	1.45	1.45	1.47	1.49	1.49
Hauling Emission	Rolling 12-month total (tons/year)												0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00
Truck Emission	Rolling 12-month total (tons/year)												0.17	0.17	0.16	0.14	0.12	0.10	0.08	0.07	0.06
Worker Travel	Rolling 12-month total (tons/year)												0.20	0.21	0.22	0.23	0.24	0.23	0.23	0.22	0.21
Hauling Emission PM2.5	(tons/month)	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Truck Emission PM2.5	(tons/month)	0.01	0.02	0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Worker Travel PM2.5	(tons/month)	0.01	0.01	0.01	0.01	0.03	0.02	0.03	0.03	0.03	0.03	0.04	0.03	0.03	0.03	0.03	0.03	0.02	0.02	0.01	0.01
Hauling Emission PM2.5	Rolling 12-month total (tons/year)												0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00
Truck Emission PM2.5	Rolling 12-month total (tons/year)												0.17	0.17	0.16	0.14	0.12	0.10	0.08	0.07	0.06
Worker Travel PM2.5	Rolling 12-month total (tons/year)												0.28	0.30	0.32	0.34	0.36	0.35	0.35	0.33	0.31

Table 3.1D-5 (cont.)

		2013						2014												2015	
Calendar Month		**July**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**July**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Jan**	**Feb**
Project Month		**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
CO2																					
Off-Road Equipment	(MT/month)	85.13	87.64	186.97	510.73	339.14	357.21	313.58	289.29	310.06	314.95	303.13	274.90	286.45	252.12	264.12	243.75	299.10	338.31	441.84	365.09
Hauling Emission	(MT/month)	13.66	13.66	13.66	19.30	15.01	15.73	16.48	14.33	15.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Truck Emission	(MT/month)	58.68	78.58	75.01	89.55	86.24	96.19	73.41	63.83	67.02	47.75	44.94	40.21	35.24	32.17	22.47	20.55	15.32	8.81	5.62	2.55
Worker Travel	(MT/month)	119.91	149.99	140.36	180.47	357.99	352.78	359.37	346.64	355.70	408.74	609.50	427.39	463.56	437.04	437.63	394.10	273.11	305.01	233.16	188.84
Off-Road Equipment	Rolling 12-month total (MT/year)												3,373	3,574	3,739	3,816	3,549	3,509	3,490	3,618	3,694
Hauling Emission	Rolling 12-month total (MT/year)												137	123	110	96	77	62	46	29	15
Truck Emission	Rolling 12-month total (MT/year)												821	798	752	699	630	559	472	404	343
Worker Travel	Rolling 12-month total (MT/year)												3,809	4,152	4,440	4,737	4,950	4,866	4,818	4,692	4,534
CH4																					
Off-Road Equipment	(MT/month)	0.01	0.01	0.02	0.04	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.02	0.03	0.02	0.02	0.02	0.03	0.03	0.03	0.03
Hauling Emission	(MT/month)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Truck Emission	(MT/month)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Travel	(MT/month)	0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.03	0.02	0.02	0.02	0.02	0.02	0.01	0.02	0.01	0.01
Off-Road Equipment	Rolling 12-month total (MT/year)												0.31	0.33	0.34	0.34	0.32	0.32	0.32	0.32	0.32
Hauling Emission	Rolling 12-month total (MT/year)												0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Truck Emission	Rolling 12-month total (MT/year)												0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Travel	Rolling 12-month total (MT/year)												0.21	0.22	0.23	0.24	0.25	0.24	0.24	0.23	0.22
N2O																					
Off-Road Equipment	(MT/month)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling Emission	(MT/month)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Truck Emission	(MT/month)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Travel	(MT/month)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Off-Road Equipment	Rolling 12-month total (MT/year)												0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling Emission	Rolling 12-month total (MT/year)												0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Truck Emission	Rolling 12-month total (MT/year)												0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Travel	Rolling 12-month total (MT/year)												0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CO2e																					
Off-Road Equipment	(MT/month)	85.32	87.83	187.30	511.58	339.82	357.93	314.16	289.84	310.63	315.54	303.70	275.41	286.98	252.59	264.62	244.20	299.65	338.94	442.48	365.64
Hauling Emission	(MT/month)	13.67	13.67	13.67	19.31	15.02	15.74	16.49	14.34	15.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Truck Emission	(MT/month)	58.71	78.61	75.04	89.59	86.27	96.23	73.44	63.86	67.05	47.76	44.96	40.23	35.25	32.18	22.48	20.56	15.33	8.81	5.62	2.56
Worker Travel	(MT/month)	120.05	150.17	140.53	180.68	358.42	353.20	359.78	347.03	356.10	409.20	610.19	427.87	464.08	437.53	438.12	394.55	273.42	305.36	233.41	189.04
Off-Road Equipment	Rolling 12-month total (MT/year)												3,379	3,581	3,745	3,823	3,555	3,515	3,496	3,625	3,700
Hauling Emission	Rolling 12-month total (MT/year)												137	123	110	96	77	62	46	29	15
Truck Emission	Rolling 12-month total (MT/year)												822	798	752	699	630	559	472	404	343
Worker Travel	Rolling 12-month total (MT/year)												3,813	4,157	4,445	4,742	4,956	4,871	4,823	4,697	4,539

Table 3.1D-6
Daily Emission Calculations

	2013						2014												2015	
Calendar Month	**July**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**July**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Jan**	**Feb**
Project Month	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
ROG (lbs/day)																				
Off-Road Equipment	5.96	6.51	14.17	30.97	21.10	22.18	22.28	23.89	24.13	23.44	22.60	21.43	20.37	19.67	19.67	17.48	24.36	23.98	32.13	30.73
Hauling Emission	0.81	0.85	0.89	0.97	0.79	0.82	0.87	0.87	0.87	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Truck Emission	2.31	3.24	3.24	3.01	3.01	3.35	2.58	2.58	2.58	1.76	1.65	1.55	1.24	1.24	0.83	0.72	0.62	0.31	0.18	0.09
Worker Travel	5.23	6.84	6.70	6.70	13.81	13.61	14.76	16.37	16.00	17.55	26.17	19.22	19.04	19.66	18.79	16.18	12.90	12.53	9.51	8.47
Total	**14.31**	**17.44**	**25.00**	**41.65**	**38.71**	**39.96**	**40.49**	**43.71**	**43.58**	**42.75**	**50.42**	**42.20**	**40.65**	**40.57**	**39.29**	**34.38**	**37.88**	**36.82**	**41.82**	**39.29**
NOx (lbs/day)																				
Off-Road Equipment	38.22	41.51	91.24	194.20	135.02	142.03	142.01	151.68	153.83	149.31	143.88	136.50	129.79	125.26	125.26	111.06	155.46	152.98	206.44	189.90
Hauling Emission	8.82	9.22	9.66	10.62	8.58	8.99	9.43	9.43	9.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Truck Emission	31.66	44.32	44.32	41.16	41.16	45.91	34.93	34.93	34.93	23.75	22.35	20.96	16.77	16.77	11.18	9.78	8.38	4.19	2.46	1.23
Worker Travel	6.59	8.62	8.45	8.45	17.41	17.15	18.31	20.31	19.85	21.77	32.47	23.85	23.62	24.39	23.31	20.08	16.00	15.54	11.55	10.29
Total	**85.29**	**103.67**	**153.67**	**254.43**	**202.17**	**214.08**	**204.68**	**216.35**	**218.04**	**194.83**	**198.70**	**181.31**	**170.18**	**166.42**	**159.75**	**140.92**	**179.84**	**172.71**	**220.45**	**201.42**
CO (lbs/day)																				
Off-Road Equipment	41.49	45.54	98.60	200.69	142.74	152.71	171.74	183.67	191.08	184.64	181.14	172.99	163.85	157.41	157.41	141.29	191.34	187.81	217.99	199.85
Hauling Emission	4.62	4.83	5.06	5.56	4.49	4.71	5.05	5.05	5.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Truck Emission	13.91	19.47	19.47	18.08	18.08	20.17	15.77	15.77	15.77	10.72	10.09	9.46	7.57	7.57	5.05	4.42	3.78	1.89	1.14	0.57
Worker Travel	59.52	77.83	76.30	76.30	157.18	154.89	166.72	184.93	180.73	198.24	295.61	217.15	215.05	222.06	212.25	182.83	145.70	141.50	105.82	94.28
Total	**119.54**	**147.67**	**199.43**	**300.63**	**322.49**	**332.48**	**359.28**	**389.42**	**392.63**	**393.60**	**486.84**	**399.60**	**386.47**	**387.04**	**374.71**	**328.54**	**340.82**	**331.20**	**324.95**	**294.70**
SO2 (lbs/day)																				
Off-Road Equipment	0.08	0.09	0.18	0.39	0.27	0.28	0.30	0.32	0.33	0.32	0.31	0.30	0.28	0.27	0.27	0.24	0.33	0.33	0.41	0.37
Hauling Emission	0.01	0.01	0.01	0.02	0.01	0.01	0.02	0.02	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Truck Emission	0.05	0.07	0.07	0.07	0.07	0.08	0.07	0.07	0.07	0.05	0.04	0.04	0.03	0.03	0.02	0.02	0.02	0.01	0.01	0.00
Worker Travel	0.11	0.15	0.14	0.14	0.30	0.29	0.34	0.38	0.37	0.41	0.61	0.45	0.44	0.46	0.44	0.38	0.30	0.29	0.24	0.21
Total	**0.25**	**0.32**	**0.40**	**0.62**	**0.65**	**0.66**	**0.73**	**0.79**	**0.79**	**0.78**	**0.96**	**0.79**	**0.75**	**0.76**	**0.73**	**0.64**	**0.65**	**0.63**	**0.66**	**0.58**
PM10 (lbs/day)																				
Fugitive	1.27	1.32	1.39	8.95	8.95	8.95														
Fugitive - Hauling	7.73	7.73	7.73	10.92	8.49	8.90	9.31	8.10	8.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fugitive - Truck	1.85	2.59	2.59	2.40	2.40	2.68	2.31	2.31	2.31	1.57	1.48	1.39	1.11	1.11	0.74	0.65	0.55	0.28	0.18	0.09
Fugitive - Worker Travel	13.78	18.01	17.66	17.66	36.38	35.85	42.03	46.63	45.57	49.98	74.53	54.75	54.22	55.99	53.51	46.10	36.74	35.68	29.14	25.96
Total	**24.63**	**29.65**	**29.37**	**39.93**	**56.22**	**56.38**	**53.65**	**57.04**	**56.38**	**51.55**	**76.01**	**56.14**	**55.33**	**57.10**	**54.25**	**46.75**	**37.29**	**35.96**	**29.32**	**26.05**
Off-Road Equipment	2.59	2.92	6.02	11.94	8.98	9.58	11.00	11.97	12.25	11.87	11.67	11.11	10.51	10.13	10.13	9.18	12.19	11.99	13.43	12.30
Hauling Emission	0.36	0.38	0.40	0.44	0.35	0.37	0.38	0.38	0.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Truck Emission	1.19	1.67	1.67	1.55	1.55	1.73	1.33	1.33	1.33	0.90	0.85	0.80	0.64	0.64	0.42	0.37	0.32	0.16	0.09	0.05
Worker Travel	0.48	0.63	0.61	0.61	1.26	1.25	1.49	1.66	1.62	1.78	2.65	1.95	1.93	1.99	1.90	1.64	1.31	1.27	1.05	0.93
Total	**4.62**	**5.60**	**8.70**	**14.54**	**12.14**	**12.93**	**14.20**	**15.34**	**15.58**	**14.55**	**15.17**	**13.86**	**13.08**	**12.76**	**12.45**	**11.19**	**13.82**	**13.42**	**14.57**	**13.28**
Hauling Emission PM10	8.09	8.11	8.13	11.36	8.84	9.27	9.69	8.48	8.88	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Truck Emission PM10	3.04	4.26	4.26	3.95	3.95	4.41	3.64	3.64	3.64	2.47	2.33	2.19	1.75	1.75	1.16	1.02	0.87	0.44	0.27	0.14
Worker Travel PM10	14.26	18.64	18.27	18.27	37.64	37.10	43.52	48.29	47.19	51.76	77.18	56.70	56.15	57.98	55.41	47.74	38.05	36.95	30.19	26.89
Total	**29.25**	**35.25**	**38.07**	**54.47**	**68.36**	**69.31**	**67.85**	**72.38**	**71.96**	**66.10**	**91.18**	**70.00**	**68.41**	**69.86**	**66.70**	**57.94**	**51.11**	**49.38**	**43.89**	**39.33**
PM2.5 (lbs/day)																				
Fugitive	0.00	0.00	0.00	4.91	4.91	4.91														
Fugitive - Hauling	0.01	0.02	0.02	0.02	0.01	0.01	0.02	0.02	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fugitive - Truck	0.05	0.07	0.07	0.07	0.07	0.07	0.06	0.06	0.06	0.04	0.04	0.04	0.03	0.03	0.02	0.02	0.02	0.01	0.01	0.00
Fugitive - Worker Travel	0.20	0.27	0.26	0.26	0.54	0.53	0.62	0.69	0.67	0.74	1.10	0.81	0.80	0.83	0.79	0.68	0.54	0.53	0.43	0.38
Total	**0.26**	**0.36**	**0.35**	**5.26**	**5.53**	**5.52**	**0.70**	**0.77**	**0.75**	**0.78**	**1.14**	**0.85**	**0.83**	**0.86**	**0.81**	**0.70**	**0.56**	**0.54**	**0.44**	**0.38**
Off-Road Equipment	2.59	2.92	6.02	11.94	8.98	9.58	11.00	11.97	12.25	11.87	11.67	11.11	10.51	10.13	10.13	9.18	12.19	11.99	13.43	12.30
Hauling Emission	0.33	0.35	0.37	0.40	0.33	0.34	0.35	0.35	0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Truck Emission	1.10	1.53	1.53	1.42	1.42	1.59	1.22	1.22	1.22	0.83	0.78	0.73	0.59	0.59	0.39	0.34	0.29	0.15	0.09	0.04
Worker Travel	0.44	0.58	0.57	0.57	1.17	1.15	1.38	1.54	1.50	1.65	2.45	1.80	1.79	1.84	1.76	1.52	1.21	1.17	0.97	0.87
Total	**4.46**	**5.38**	**8.49**	**14.33**	**11.90**	**12.66**	**13.95**	**15.08**	**15.32**	**14.35**	**14.90**	**13.64**	**12.89**	**12.56**	**12.28**	**11.04**	**13.69**	**13.31**	**14.49**	**13.21**
Hauling Emission PM2.5	0.34	0.37	0.39	0.42	0.34	0.35	0.37	0.37	0.37	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Truck Emission PM2.5	1.15	1.60	1.60	1.49	1.49	1.66	1.28	1.28	1.28	0.87	0.82	0.77	0.62	0.62	0.41	0.36	0.31	0.16	0.10	0.04
Worker Travel PM2.5	0.64	0.85	0.83	0.83	1.71	1.68	2.00	2.23	2.17	2.39	3.55	2.61	2.59	2.67	2.55	2.20	1.75	1.70	1.40	1.25
Total	**4.72**	**5.74**	**8.84**	**19.59**	**17.43**	**18.18**	**14.65**	**15.85**	**16.07**	**15.13**	**16.04**	**14.49**	**13.72**	**13.42**	**13.09**	**11.74**	**14.25**	**13.85**	**14.93**	**13.59**
CO2 (lbs/day)																				
Off-Road Equipment	8,163	8,785	19,634	41,714	28,765	30,297	30,066	31,897	32,560	31,570	30,385	28,867	27,464	26,475	26,475	23,370	32,979	32,437	44,289	40,255
Hauling Emission	1,305	1,365	1,429	1,571	1,269	1,330	1,575	1,575	1,575	0	0	0	0	0	0	0	0	0	0	0
Truck Emission	5,622	7,871	7,871	7,309	7,309	8,152	7,033	7,033	7,033	4,783	4,501	4,220	3,376	3,376	2,251	1,969	1,688	844	563	282
Worker Travel	11,175	14,613	14,327	14,327	29,513	29,084	33,490	37,149	36,304	39,822	59,381	43,621	43,199	44,606	42,636	36,726	29,269	28,424	22,714	20,236
Total	**26,265**	**32,634**	**43,261**	**64,921**	**66,856**	**68,862**	**72,164**	**77,654**	**77,472**	**76,175**	**94,268**	**76,708**	**74,040**	**74,457**	**71,362**	**62,066**	**63,935**	**61,705**	**67,566**	**60,773**
CH4 (lbs/day)																				
Off-Road Equipment	0.84	0.92	1.64	3.29	2.73	2.92	2.64	2.89	2.84	2.77	2.70	2.56	2.43	2.36	2.36	2.07	2.90	2.87	3.05	2.89
Hauling Emission	0.04	0.04	0.04	0.05	0.04	0.04	0.04	0.04	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Truck Emission	0.11	0.16	0.16	0.15	0.15	0.16	0.12	0.12	0.12	0.08	0.08	0.07	0.06	0.06	0.04	0.03	0.03	0.01	0.01	0.00
Worker Travel	0.64	0.84	0.82	0.82	1.70	1.67	1.83	2.03	1.98	2.18	3.25	2.38	2.36	2.44	2.33	2.01	1.60	1.55	1.18	1.05
Total	**1.63**	**1.96**	**2.66**	**4.31**	**4.62**	**4.79**	**4.63**	**5.08**	**4.98**	**5.03**	**6.03**	**5.01**	**4.85**	**4.86**	**4.73**	**4.11**	**4.53**	**4.43**	**4.24**	**3.94**
N2O (lbs/day)																				
Off-Road Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling Emission	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Truck Emission	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Travel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
CO2e (lbs/day)																				
Off-Road Equipment	8,180	8,804	19,669	41,783	28,822	30,358	30,121	31,958	32,619	31,628	30,442	28,921	27,515	26,524	26,524	23,414	33,040	32,497	44,353	40,316
Hauling Emission	1,306	1,365	1,430	1,572	1,270	1,330	1,576	1,576	1,576	0	0	0	0	0	0	0	0	0	0	0
Truck Emission	5,625	7,874	7,874	7,312	7,312	8,156	7,036	7,036	7,036	4,784	4,503	4,221	3,377	3,377	2,251	1,970	1,689	844	563	282
Worker Travel	11,188	14,631	14,344	14,344	29,549	29,119	33,528	37,191	36,346	39,868	59,449	43,671	43,249	44,658	42,685	36,769	29,302	28,457	22,739	20,258
Total	**26,299**	**32,675**	**43,317**	**65,011**	**66,953**	**68,963**	**72,261**	**77,761**	**77,577**	**76,281**	**94,394**	**76,814**	**74,141**	**74,559**	**71,461**	**62,152**	**64,030**	**61,798**	**67,655**	**60,855**

Table 3.1D-7

CalEEMod Input Data

Project Name	ESECII	
District	SCAQMD	
Wind Speed	2.2	m/s
Precipitation Frequency	31	days/year
Climate Zone	15	
Urbanization Level	Urban	
Expected Operational Year	2016	
Utility Company	Southern California Edison	
CO2 Intensity Factor	641.26	
CH4 Intensity Factor	0.029	
N2O Intensity Factor	0.011	

For 20-month Construction Schedule

CalEEMod Phase Name	Phase Type	Start Date	End Date	# day/Week	Number of Days	Daily hours	Month
Demolition 1	Demolition	2013/07/01	2013/07/31	5	23	8	1
Demolition 2	Demolition	2013/08/01	2013/08/31	5	22	8	2
Demolition 3	Demolition	2013/09/01	2013/09/30	5	25	8	3
Site Grading 4	Site Preparation	2013/10/01	2013/10/31	6	27	16	4
Site Grading 5	Site Preparation	2013/09/01	2013/09/30	6	25	16	5
Site Grading 6	Site Preparation	2013/10/01	2013/10/31	6	27	16	6
Building Construction 7	Building Construction	2014/01/01	2014/01/31	5	23	8	7
Building Construction 8	Building Construction	2014/02/01	2014/02/28	5	20	8	8
Building Construction 9	Building Construction	2014/03/01	2014/03/31	5	21	8	9
Building Construction 10	Building Construction	2014/04/01	2014/04/30	5	22	8	10
Building Construction 11	Building Construction	2014/05/01	2014/05/31	5	22	8	11
Building Construction 12	Building Construction	2014/06/01	2014/06/30	5	21	8	12
Building Construction 13	Building Construction	2014/07/01	2014/07/31	5	23	8	13
Building Construction 14	Building Construction	2014/08/01	2014/08/31	5	21	8	14
Building Construction 15	Building Construction	2014/09/01	2014/09/30	5	22	8	15
Building Construction 16	Building Construction	2014/10/01	2014/10/31	5	23	8	16
Building Construction 17	Building Construction	2014/11/01	2014/11/30	5	20	8	17
Building Construction 18	Building Construction	2014/12/01	2014/12/31	5	23	8	18
Paving	Paving	2015/01/01	2015/01/31	5	21	8	19
Architectural Coating	Architectural Coating	2015/02/01	2015/02/28	5	22	8	20

Table 3.1D-8
Equipment Schedule

					2013						2014												2015		
	Calendar Month				July	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec	Jan	Feb	
	Project Month				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
Example Equipment	Equipment Type	# Unit	Rating (hp)	Load Factor	Demolition		Site Preparation				Building Construction												Paving	Archit. Coating	Total
Air Compressors	**Air Compressors**	1	81	0.73	0	0	2	2	2	2	3	4	4	4	4	4	4	4	4	4	4	4	3	3	61
Ingersoll Rand, Diesel, 185 cfm							2	2	2	2	3	4	4	4	4	4	4	4	4	4	4	4	3	3	
Cranes	**Cranes**	3	208	0.43	0	0	1	1	1	1	2	2	5	5	5	4	4	4	4	4	4	4	4	2	57
Manitowoc 4100, 225 Ton													1	1	1	1	1	1	1	1	1	1	1		
Manitowoc, 150 Ton													1	1	1	1	1	1	1	1	1	1	1		
Grove, 20 Ton							1	1	1	1	2	2	3	3	3	2	2	2	2	2	2	2	2	2	
Excavator, Motor Grader	**Excavators**	1	162	0.61	3	3	3	1	1	1	1	1	0	0	0	0	0	0	0	0	0	1	1	1	17
140G					3	3	3	1	1	1	1	1										1	1	1	
Trucks	**Off-Highway Trucks**	6	381	0.57	1	1	6	6	6	6	21	22	17	17	16	16	14	14	12	10	9	8	8	8	218
1500 Light Duty					1	1	1	1	1	1	4	5	5	5	5	5	5	5	5	3	3	2	2	2	
International, Fuel/Lube							1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	
Large Truck, Cat, D200											1	1	1	1	1	1	1	1	1	1	1	1	1	1	
Large Truck, Flatbed Ford							1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
Large Truck, Dump Trucks - Contract							1	1	1	1	12	12	7	7	6	6	4	4	2	2	1	1	1	1	
Water Truck, International							2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
Portable Compression Equipment, Concrete Vibrators, Lifts	**Other Construction Equipment**	4	327	0.62	0	0	0	0	0	0	11	11	14	13	14	14	13	12	12	11	12	12	7	6	162
Portable Compression Equip, Multiquip, Jumping Jack											3	3	2	2	2	2	2	2	2	2	2	2			
Portable Compression Equip, Multiquip, Plate Compactor											2	1	3	2	2	2	2	2	2	2	2	2			
Concrete Vibrators, North Rock, flex shaft											2	3	3	3	4	4	3	2	2	1	1	1	1		
Manlift, JLG & Scissor Lift, 60 Footer											2	2	3	3	3	3	3	3	3	3	3	3	2	2	
Manlift, JLG & Scissor Lift, 80 Footer											1	1	1	1	1	1	1	1	1	1	2	2	2	2	
Manlift, JLG & Scissor Lift, Scissor Lift											1	1	2	2	2	2	2	2	2	2	2	2	2	2	
Light Towers	**Other General Industrial Equipment**	1	150	0.51	0	0	2	2	2	2	2	2	1	1	0	0	0	0	0	0	2	2	2	2	22
Magnum 5000, 15.5 hp							2	2	2	2	2	2	1	1							2	2	2	2	
Tanks, Fuel/Lube	**Other Material Handling Equipment**	1	196	0.59	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	18
750 Gallons Each							1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
Paving Equipment	**Paving Equipment**	1	162	0.61	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	2	2	2	2	10
Asphalt Paver, Cat, AP-800D, Diesel, 102 hp								1		1											2	2	2	2	
Compactors	**Plate Compactors**	3	358	0.59	0	0	2	2	2	2	1	1	1	1	1	1	1	1	1	1	0	0	0	0	18
Cat, CS-563, Diesel, 145 hp							2	2	2	2	1	1	1	1	1	1	1	1	1	1					
Truck Concrete Pump	**Pumps**	1	84	0.74	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	0	0	0	9
Concrete Pump Truck, International													1	1	1	1	1	1	1	1	1				
Dozer	**Rubber Tired Dozers**	1	75	0.55	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	0	1	1	1	1	27
Cat, D4					2	2	2	2	2	2	2	2	1	1	1	1	1	1	1		1	1	1	1	
Excavator, Back Hoe	**Tractors/Loaders/Backhoes**	2	75	0.55	2	3	2	2	2	2	4	4	2	2	2	1	1	1	1	1	2	2	1	1	38
Back Hoe, Cat, 312					1	1	1	1	1	1	2	2	2	2	2	1	1	1	1	1	2	2	1	1	
Loader, 938F					1	2	1	1	1	1	2	2													
Welders	**Welders**	2	46	0.45	0	0	0	0	0	0	5	8	8	8	8	8	7	7	7	7	7	7	5	5	97
200 AMP Diesel											3	5	5	5	5	5	4	4	4	4	4	4	3	3	
300 AMP Diesel											2	3	3	3	3	3	3	3	3	3	3	3	2	2	
	CalEEMod INPUT																								
Air Compressors	Air Compressors	1	81	0.73	0	0	2	2	2	2	3	4	4	4	4	4	4	4	4	4	4	4	3	3	61
Cranes	Cranes	3	208	0.43	0	0	1	1	1	1	2	2	5	5	5	4	4	4	4	4	4	4	4	2	57
Excavator, Motor Grader	Excavators/Graders	3	162	0.61	3	3	3	1	1	1	1	1	0	0	0	0	0	0	0	0	0	1	1	1	13
Trucks	Off-Highway Trucks	6	381	0.57	1	1	6	6	6	6	21	22	17	17	16	16	14	14	12	10	9	8	8	8	218
Portable Compression Equipment, Concrete Vibrators, Lifts	Other Construction Equipment	4	327	0.62	0	0	0	0	0	0	11	11	14	13	14	14	13	12	12	11	12	12	7	6	162
Light Towers	Other General Industrial Equipment	1	150	0.51	0	0	2	2	2	2	2	2	1	1	0	0	0	0	0	0	2	2	2	2	22
Tanks, Fuel/Lube	Other Material Handling Equipment	1	196	0.59	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	18
Paving Equipment	Paving Equipment	1	162	0.61	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	2	2	2	2	10
Compactors	Plate Compactors	3	358	0.59	0	0	2	2	2	2	1	1	1	1	1	1	1	1	1	1	0	0	0	0	18
Truck Concrete Pump	Pumps	1	84	0.74	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	0	0	0	9
Dozer	Rubber Tired Dozers	1	75	0.55	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	0	1	1	1	1	27
Excavator, Back Hoe	Tractors/Loaders/Backhoes	2	75	0.55	2	3	2	2	2	2	4	4	2	2	2	1	1	1	1	1	2	2	1	1	38
Welders	Welders	2	46	0.45	0	0	0	0	0	0	5	8	8	8	8	8	7	7	7	7	7	7	5	5	97

Table 3.1D-9
Vehicle Trips

	2013						2014												2015	
Calendar Month	**July**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**July**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Jan**	**Feb**
Project Month	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
Number of days	23	22	25	27	21	22	23	20	21	22	22	21	23	21	22	23	20	23	21	22
Estimated Total Number of Workers	78	102	100	100	206	203	238	264	258	283	**422**	310	307	317	303	261	208	202	165	147
Workers Trip (Daily)	156	204	200	200	412	406	476	528	516	566	**844**	620	614	634	606	522	416	404	330	294
CalEEMod Input																				
Worker Trip (trips/day)	156	204	200	200	412	406	476	528	516	566	**844**	620	614	634	606	522	416	404	330	294
Work Trip Length (miles)	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0
Estimated Truck Deliveries																				
Demolition	455	620	700																	
Site preparation				700	550	638														
Building Construction							343	502	569	377	349	307	286	257	186	167	128	75	51	28
Truck Deliveries (Monthly)	455	620	700	700	550	638	343	502	569	377	349	307	286	257	186	167	128	75	51	28
Estimated Truck Deliveries (Daily)	20	28	28	26	26	**29**	**25**	**25**	**25**	17	16	15	12	12	8	7	6	3	2	1
CalEEMod Input																				
Vendor Trip (trips/day)	20	28	28	26	26	**29**	**25**	**25**	**25**	17	16	15	12	12	8	7	6	3	2	1
Vender Trip Length (miles)	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0
Total Hauling Trip	363	363	363	513	**399**	**418**	**437**	**380**	**399**	0	0	0	0	0	0	0	0	0	0	0
Hauling Trip Length (miles)	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40

Table 3.1D-10
EMFAC Output

EMFAC2011 Emission
Region: South Coast AQMD
Calendar Year: 2013
Vehicle Classification: EMFAC2007 Categories

*Methane (CH4) calculation method: Run EMFAC2011-LDV to calculate CH4 for those vehicle categories; Use CH4 = 0.0408 * TOG = 0.058821 * THC to calculate CH4 for EMFAC2011-HD categories.*
Running emissions for all pollutants and PM emissions from tire and brake wear were divided by the VMT of each respective vehicle class to derive emission factors in units of
Since trip numbers reported in EMFAC for diesel emissions is unreliable, running emissions are adjusted to account also for the idling and startup emission, aggregated for both gasoline and diesel

Veh_Class		LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
EMFAC 2011 Emission Rates - Annual														
CH4_IDLEX	(gms/trip)	0	0	0	0	0	0	0	0	0	0	0	0	0
CH4_RUNEX	(gms/VMT)	0.0064041	0.014393	0.007113	0.009647	0.014114	0.011166	0.01758	0.019926	0.027492	0.036171	0.155926	0.029925	0.010471
CH4_STREX	(gms/trip)	0	0	0	0	0	0	0	0	0	0	0	0	0
CO_IDLEX	(gms/trip)	0	0	0	0	0	0	0	0	0	0	0	0	0
CO_RUNEX	(gms/VMT)	2.1149861	5.082289	2.863604	3.820193	3.929277	2.838538	4.194569	3.166295	7.958921	6.396781	28.90769	7.796711	7.467442
CO_STREX	(gms/trip)	0	0	0	0	0	0	0	0	0	0	0	0	0
CO2_IDLEX	(gms/trip)	0	0	0	0	0	0	0	0	0	0	0	0	0
CO2_RUNEX	(gms/VMT)	371.79237	425.6814	505.4595	638.7492	607.6722	581.8611	1038.268	1769.789	1138.004	2203.051	158.7879	1234.505	678.0106
CO2_STREX	(gms/trip)	0	0	0	0	0	0	0	0	0	0	0	0	0
NOX_IDLEX	(gms/trip)	0	0	0	0	0	0	0	0	0	0	0	0	0
NOX_RUNEX	(gms/VMT)	0.1774866	0.444036	0.33044	0.470929	2.178222	3.029517	5.419063	9.527669	7.064714	13.58459	1.302677	9.69994	2.080244
NOX_STREX	(gms/trip)	0	0	0	0	0	0	0	0	0	0	0	0	0
PM10_IDLEX	(gms/trip)	0	0	0	0	0	0	0	0	0	0	0	0	0
PM10_PMBW	(gms/VMT)	0.03675	0.03675	0.03675	0.03675	0.046265	0.062999	0.112047	0.060134	0.09098	0.677064	0.036746	0.575619	0.051331
PM10_PMTW	(gms/VMT)	0.008	0.008	0.008	0.008	0.008959	0.010003	0.011218	0.034781	0.010318	0.008	0.007999	0.011044	0.008623
PM10_RUNEX	(gms/VMT)	0.0029933	0.00677	0.002937	0.003139	0.010265	0.018791	0.159224	0.290476	0.159405	0.21437	0.001529	0.189875	0.034167
PM10_STREX	(gms/trip)	0	0	0	0	0	0	0	0	0	0	0	0	0
PM2_5_IDLEX	(gms/trip)	0	0	0	0	0	0	0	0	0	0	0	0	0
PM2_5_PMBW	(gms/VMT)	0.01575	0.01575	0.01575	0.01575	0.019828	0.027	0.04802	0.025772	0.038991	0.29017	0.015748	0.246694	0.021999
PM2_5_PMTW	(gms/VMT)	0.002	0.002	0.002	0.002	0.00224	0.002501	0.002805	0.008695	0.002579	0.002	0.002	0.002761	0.002156
PM2_5_RUNEX	(gms/VMT)	0.0027215	0.006175	0.002683	0.002881	0.009443	0.017268	0.146438	0.267234	0.1466	0.197188	0.001206	0.174552	0.031352
PM2_5_STREX	(gms/trip)	0	0	0	0	0	0	0	0	0	0	0	0	0
ROG_DIURN	(gms/trip)	0	0	0	0	0	0	0	0	0	0	0	0	0
ROG_HTSK	(gms/trip)	0	0	0	0	0	0	0	0	0	0	0	0	0
ROG_IDLEX	(gms/trip)	0	0	0	0	0	0	0	0	0	0	0	0	0
ROG_RESTL	(gms/trip)	0	0	0	0	0	0	0	0	0	0	0	0	0
ROG_RUNEX	(gms/VMT)	0.1569633	0.352774	0.17434	0.236449	0.345923	0.273679	0.430878	0.488395	0.673824	0.886556	3.821706	0.733456	0.256644
ROG_RUNLS	(gms/VMT)	0.0022064	0.005189	0.002212	0.002313	0.008802	0.016603	0.145193	0.262347	0.142678	0.197158	0.000659	0.166705	0.031333
ROG_STREX	(gms/trip)	0	0	0	0	0	0	0	0	0	0	0	0	0
SOX_IDLEX	(gms/trip)	0	0	0	0	0	0	0	0	0	0	0	0	0
SOX_RUNEX	(gms/VMT)	0.0037473	0.004337	0.005094	0.006442	0.006079	0.005737	0.010021	0.016905	0.011104	0.021175	0.002143	0.011975	0.006815
SOX_STREX	(gms/trip)	0	0	0	0	0	0	0	0	0	0	0	0	0
TOG_DIURN	(gms/trip)	0	0	0	0	0	0	0	0	0	0	0	0	0
TOG_HTSK	(gms/trip)	0	0	0	0	0	0	0	0	0	0	0	0	0
TOG_IDLEX	(gms/trip)	0	0	0	0	0	0	0	0	0	0	0	0	0
TOG_RESTL	(gms/trip)	0	0	0	0	0	0	0	0	0	0	0	0	0
TOG_RUNEX	(gms/VMT)	0.1779535	0.395911	0.202392	0.277045	0.381748	0.303754	0.480022	0.555702	0.745834	0.985625	4.117167	0.815247	0.296722
TOG_RUNLS	(gms/VMT)	0.0753128	0.228343	0.10446	0.105847	0.146604	0.102687	0.065967	0.003057	0.133895	0.025105	0.535327	0.065888	0.018811
TOG_STREX	(gms/trip)	0	0	0	0	0	0	0	0	0	0	0	0	0

Table 3.1D-10
EMFAC Output (cont.)

EMFAC2011 Emission
Region: South Coast AQMD
Calendar Year: 2013
Vehicle Classification: EMFAC2007 Categories

*Methane (CH4) calculation method: Run EMFAC2011-LDV to calculate CH4 for those vehicle categories; Use CH4 = 0.0408 * TOG = 0.058821 * THC to calculate CH4 for EMFAC2011-HD categories.*
Running emissions for all pollutants and PM emissions from tire and brake wear were divided by the VMT of each respective vehicle class to derive emission factors in units of
Since trip numbers reported in EMFAC for diesel emissions is unreliable, running emissions are adjusted to account also for the idling and startup emission, aggregated for both gasoline and diesel

Veh_Class		LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
EMFAC 2011 Emission Rates - Summer														
CH4_IDLEX	(gms/trip)	0	0	0	0	0	0	0	0	0	0	0	0	0
CH4_RUNEX	(gms/VMT)	0.0069641	0.015917	0.007663	0.010169	0.013545	0.010746	0.016814	0.019741	0.025752	0.03641	0.164788	0.029538	0.010879
CH4_STREX	(gms/trip)	0	0	0	0	0	0	0	0	0	0	0	0	0
CO_IDLEX	(gms/trip)	0	0	0	0	0	0	0	0	0	0	0	0	0
CO_RUNEX	(gms/VMT)	2.1457761	5.147307	2.914199	3.875278	3.601554	2.625732	3.835595	3.059351	6.993247	6.378591	27.92078	7.574027	7.487691
CO_STREX	(gms/trip)	0	0	0	0	0	0	0	0	0	0	0	0	0
CO2_IDLEX	(gms/trip)	0	0	0	0	0	0	0	0	0	0	0	0	0
CO2_RUNEX	(gms/VMT)	389.87975	445.2328	529.3177	669.3112	607.6722	581.8611	1038.922	1773.357	1139.62	2203.051	158.7879	1238.926	678.0106
CO2_STREX	(gms/trip)	0	0	0	0	0	0	0	0	0	0	0	0	0
NOX_IDLEX	(gms/trip)	0	0	0	0	0	0	0	0	0	0	0	0	0
NOX_RUNEX	(gms/VMT)	0.159002	0.394114	0.295514	0.421834	2.039017	2.856607	5.109537	9.049937	6.685318	12.79502	1.139109	9.218011	1.894723
NOX_STREX	(gms/trip)	0	0	0	0	0	0	0	0	0	0	0	0	0
PM10_IDLEX	(gms/trip)	0	0	0	0	0	0	0	0	0	0	0	0	0
PM10_PMBW	(gms/VMT)	0.03675	0.03675	0.03675	0.03675	0.046265	0.062999	0.112047	0.060134	0.09098	0.677064	0.036746	0.575619	0.051331
PM10_PMTW	(gms/VMT)	0.008	0.008	0.008	0.008	0.008959	0.010003	0.011218	0.034781	0.010318	0.008	0.007999	0.011044	0.008623
PM10_RUNEX	(gms/VMT)	0.0029933	0.00677	0.002937	0.003139	0.010265	0.018791	0.159075	0.290155	0.158838	0.21437	0.001529	0.18857	0.034167
PM10_STREX	(gms/trip)	0	0	0	0	0	0	0	0	0	0	0	0	0
PM2_5_IDLEX	(gms/trip)	0	0	0	0	0	0	0	0	0	0	0	0	0
PM2_5_PMBW	(gms/VMT)	0.01575	0.01575	0.01575	0.01575	0.019828	0.027	0.04802	0.025772	0.038991	0.29017	0.015748	0.246694	0.021999
PM2_5_PMTW	(gms/VMT)	0.002	0.002	0.002	0.002	0.00224	0.002501	0.002805	0.008695	0.002579	0.002	0.002	0.002761	0.002156
PM2_5_RUNEX	(gms/VMT)	0.0027215	0.006175	0.002683	0.002881	0.009443	0.017268	0.146301	0.266939	0.146078	0.197188	0.001206	0.173352	0.031352
PM2_5_STREX	(gms/trip)	0	0	0	0	0	0	0	0	0	0	0	0	0
ROG_DIURN	(gms/trip)	0	0	0	0	0	0	0	0	0	0	0	0	0
ROG_HTSK	(gms/trip)	0	0	0	0	0	0	0	0	0	0	0	0	0
ROG_IDLEX	(gms/trip)	0	0	0	0	0	0	0	0	0	0	0	0	0
ROG_RESTL	(gms/trip)	0	0	0	0	0	0	0	0	0	0	0	0	0
ROG_RUNEX	(gms/VMT)	0.1706881	0.390112	0.187817	0.249237	0.331977	0.263392	0.412097	0.483839	0.631165	0.892393	4.038927	0.723975	0.266634
ROG_RUNLS	(gms/VMT)	0.0022064	0.005189	0.002212	0.002313	0.008802	0.016603	0.145193	0.262347	0.142678	0.197158	0.000659	0.166705	0.031333
ROG_STREX	(gms/trip)	0	0	0	0	0	0	0	0	0	0	0	0	0
SOX_IDLEX	(gms/trip)	0	0	0	0	0	0	0	0	0	0	0	0	0
SOX_RUNEX	(gms/VMT)	0.0039282	0.004532	0.005333	0.006748	0.006073	0.005734	0.010021	0.016938	0.011103	0.021175	0.002123	0.012014	0.006816
SOX_STREX	(gms/trip)	0	0	0	0	0	0	0	0	0	0	0	0	0
TOG_DIURN	(gms/trip)	0	0	0	0	0	0	0	0	0	0	0	0	0
TOG_HTSK	(gms/trip)	0	0	0	0	0	0	0	0	0	0	0	0	0
TOG_IDLEX	(gms/trip)	0	0	0	0	0	0	0	0	0	0	0	0	0
TOG_RESTL	(gms/trip)	0	0	0	0	0	0	0	0	0	0	0	0	0
TOG_RUNEX	(gms/VMT)	0.1920735	0.433545	0.216475	0.290339	0.366706	0.292666	0.459808	0.550598	0.700048	0.991751	4.323996	0.804946	0.306816
TOG_RUNLS	(gms/VMT)	0.0720826	0.214857	0.098148	0.10023	0.14382	0.100366	0.064699	0.003028	0.131253	0.02362	0.508437	0.060856	0.018498
TOG_STREX	(gms/trip)	0	0	0	0	0	0	0	0	0	0	0	0	0

Table 3.1D-10
EMFAC Output (cont.)

EMFAC2011 Emission
Region: South Coast AQMD
Calendar Year: 2013
Vehicle Classification: EMFAC2007 Categories

*Methane (CH4) calculation method: Run EMFAC2011-LDV to calculate CH4 for those vehicle categories; Use CH4 = 0.0408 * TOG = 0.058821 * THC to calculate CH4 for EMFAC2011-HD categories.*

Running emissions for all pollutants and PM emissions from tire and brake wear were divided by the VMT of each respective vehicle class to derive emission factors in units of

Since trip numbers reported in EMFAC for diesel emissions is unreliable, running emissions are adjusted to account also for the idling and startup emission, aggregated for both gasoline and diesel

Veh_Class		LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
EMFAC 2011 Emission Rates - Winter														
CH4_IDLEX	(gms/trip)	0	0	0	0	0	0	0	0	0	0	0	0	0
CH4_RUNEX	(gms/VMT)	0.0066251	0.014878	0.007296	0.009788	0.014378	0.011381	0.017894	0.02013	0.027863	0.036164	0.159263	0.03019	0.010603
CH4_STREX	(gms/trip)	0	0	0	0	0	0	0	0	0	0	0	0	0
CO_IDLEX	(gms/trip)	0	0	0	0	0	0	0	0	0	0	0	0	0
CO_RUNEX	(gms/VMT)	2.0826975	5.009002	2.818425	3.761276	3.949759	2.858022	4.275648	3.286081	8.120233	6.397682	28.81137	7.902465	7.443736
CO_STREX	(gms/trip)	0	0	0	0	0	0	0	0	0	0	0	0	0
CO2_IDLEX	(gms/trip)	0	0	0	0	0	0	0	0	0	0	0	0	0
CO2_RUNEX	(gms/VMT)	365.50806	419.0528	497.2435	628.3989	607.6722	581.8611	1037.363	1764.861	1135.774	2203.051	158.7879	1228.4	678.0106
CO2_STREX	(gms/trip)	0	0	0	0	0	0	0	0	0	0	0	0	0
NOX_IDLEX	(gms/trip)	0	0	0	0	0	0	0	0	0	0	0	0	0
NOX_RUNEX	(gms/VMT)	0.1737865	0.43396	0.323468	0.460983	2.151933	2.989843	5.326601	9.38302	6.950792	13.33742	1.275493	9.519693	2.041047
NOX_STREX	(gms/trip)	0	0	0	0	0	0	0	0	0	0	0	0	0
PM10_IDLEX	(gms/trip)	0	0	0	0	0	0	0	0	0	0	0	0	0
PM10_PMBW	(gms/VMT)	0.03675	0.03675	0.03675	0.03675	0.046265	0.062999	0.112047	0.060134	0.09098	0.677064	0.036746	0.575619	0.051331
PM10_PMTW	(gms/VMT)	0.008	0.008	0.008	0.008	0.008959	0.010003	0.011218	0.034781	0.010318	0.008	0.007999	0.011044	0.008623
PM10_RUNEX	(gms/VMT)	0.0029933	0.00677	0.002937	0.003139	0.010265	0.018791	0.15943	0.29092	0.160188	0.21437	0.001529	0.191677	0.034167
PM10_STREX	(gms/trip)	0	0	0	0	0	0	0	0	0	0	0	0	0
PM2_5_IDLEX	(gms/trip)	0	0	0	0	0	0	0	0	0	0	0	0	0
PM2_5_PMBW	(gms/VMT)	0.01575	0.01575	0.01575	0.01575	0.019828	0.027	0.04802	0.025772	0.038991	0.29017	0.015748	0.246694	0.021999
PM2_5_PMTW	(gms/VMT)	0.002	0.002	0.002	0.002	0.00224	0.002501	0.002805	0.008695	0.002579	0.002	0.002	0.002761	0.002156
PM2_5_RUNEX	(gms/VMT)	0.0027215	0.006175	0.002683	0.002881	0.009443	0.017268	0.146628	0.267643	0.147321	0.197188	0.001206	0.17621	0.031352
PM2_5_STREX	(gms/trip)	0	0	0	0	0	0	0	0	0	0	0	0	0
ROG_DIURN	(gms/trip)	0	0	0	0	0	0	0	0	0	0	0	0	0
ROG_HTSK	(gms/trip)	0	0	0	0	0	0	0	0	0	0	0	0	0
ROG_IDLEX	(gms/trip)	0	0	0	0	0	0	0	0	0	0	0	0	0
ROG_RESTL	(gms/trip)	0	0	0	0	0	0	0	0	0	0	0	0	0
ROG_RUNEX	(gms/VMT)	0.1623792	0.364662	0.178817	0.23991	0.352407	0.278956	0.438573	0.49338	0.682914	0.886382	3.903507	0.739944	0.25987
ROG_RUNLS	(gms/VMT)	0.0022064	0.005189	0.002212	0.002313	0.008802	0.016603	0.145193	0.262347	0.142678	0.197158	0.000659	0.166705	0.031333
ROG_STREX	(gms/trip)	0	0	0	0	0	0	0	0	0	0	0	0	0
SOX_IDLEX	(gms/trip)	0	0	0	0	0	0	0	0	0	0	0	0	0
SOX_RUNEX	(gms/VMT)	0.0036841	0.004269	0.005012	0.006338	0.006079	0.005738	0.010013	0.016858	0.011084	0.021175	0.002142	0.011917	0.006815
SOX_STREX	(gms/trip)	0	0	0	0	0	0	0	0	0	0	0	0	0
TOG_DIURN	(gms/trip)	0	0	0	0	0	0	0	0	0	0	0	0	0
TOG_HTSK	(gms/trip)	0	0	0	0	0	0	0	0	0	0	0	0	0
TOG_IDLEX	(gms/trip)	0	0	0	0	0	0	0	0	0	0	0	0	0
TOG_RESTL	(gms/trip)	0	0	0	0	0	0	0	0	0	0	0	0	0
TOG_RUNEX	(gms/VMT)	0.1831502	0.407511	0.206562	0.280185	0.388319	0.309121	0.487969	0.561336	0.755487	0.985383	4.199993	0.822159	0.299904
TOG_RUNLS	(gms/VMT)	0.0845601	0.269575	0.122669	0.123278	0.158797	0.111551	0.071012	0.003247	0.142824	0.029133	0.615276	0.077574	0.019839
TOG_STREX	(gms/trip)	0	0	0	0	0	0	0	0	0	0	0	0	0

APPENDIX 3.1E – COMMISSIONING EMISSIONS AND SUPPORT DATA

Table 3.1E-1
El Segundo Power Facility Modification
Monthly Emissions - Commissioning Year

	Hours per Month	CO (lbs/hr)	NOx (lbs/hr)	VOC (lbs/hr)	PM10 (lbs/hr)	SOx (lbs/hr	NH3 (lbs/hr)	CO (lbs/month)	NOX (lbs/month)	VOC (lbs/month)	PM10 (lbs/month)	SOx (lbs/month)	NH3 (lbs/month)
Unit 9 Commissioning (1)	178	663.7	44.2	30.7	9.4	1.7	16.6	118,145	7,865	5,461	1,675	301	2,952
Unit 9 Start-Up (Fast Start)	0	158.5	45.0	17.1	9.5	1.4	13.4	0	0	0	0	0	0
Unit 9 Start-Up (Traditional)	0	291.0	62.3	23.3	9.5	1.4	13.4	0	0	0	0	0	0
Unit 9 Normal Operation	0	10.9	17.9	6.2	9.5	1.7	16.6	0	0	0	0	0	0
Unit 9 Shutdown	0	322.0	37.5	34.6	9.5	1.7	16.6	0	0	0	0	0	0
Unit 9 Totals	**178**							**118,145**	**7,865**	**5,461**	**1,675**	**301**	**2,952**
Unit 11 Commissioning (2)	121	116.7	44.1	10.0	7.9	0.4	3.5	14,120	5,331	1,208	962	43	425
Unit 11 Start-Up	60	89.8	30.4	7.4	5.0	0.2	3.5	5,389	1,823	442	300	12	211
Unit 11 Normal Operation	199	4.6	4.8	1.3	5.0	0.4	3.5	921	945	263	995	71	699
Unit 11 Shutdown	60	63.1	10.3	5.6	5.0	0.4	3.5	3,785	616	335	300	21	211
Unit 11 Totals	**440**							**24,214**	**8,715**	**2,248**	**2,557**	**148**	**1,545**
Unit 12 Commissioning (2)	121	116.7	44.1	10.0	7.9	0.4	3.5	14,120	5,331	1,208	962	43	425
Unit 12 Start-Up	60	89.8	30.4	7.4	5.0	0.2	3.5	5,389	1,823	442	300	12	211
Unit 12 Normal Operation	199	4.6	4.8	1.3	5.0	0.4	3.5	921	945	263	995	71	699
Unit 12 Shutdown	60	63.1	10.3	5.6	5.0	0.4	3.5	3,785	616	335	300	21	211
Unit 12 Totals	**440**							**24,214**	**8,715**	**2,248**	**2,557**	**148**	**1,545**
Total Monthly Emissions (lb/month)								**166,573**	**25,294**	**9,956**	**6,789**	**597**	**6,042**

Note 1: Based on highest 30 consecutive days of commissioning emissions for this unit
Note 2: Based on entire commissioning period for this unit

Table 3.1E-2
El Segundo Power Facility Modification
Annual Emissions - Commissioning Year

	Hours per Year	CO (lbs/hr)	NOx (lbs/hr)	VOC (lbs/hr)	PM10 (lbs/hr)	SOx (lbs/hr)	NH3 (lbs/hr)	CO (lbs/yr)	NOX (lbs/yr)	VOC (lbs/yr)	PM10 (lbs/yr)	SOx (lbs/yr)	NH3 (lbs/yr)
Unit 9 Commissioning	415	314.1	30.1	16.8	9.4	1.4	13.4	130,337	12,478	6,952	3,911	566	5,552
Unit 9 Start-Up (Fast)	150	158.5	45.0	17.1	9.5	1.4	13.4	23,769	6,746	2,561	1,425	204	2,007
Unit 9 Start-Up (Trad)	50	291.0	62.3	23.3	9.5	1.4	13.4	14,550	3,113	1,163	475	68	669
Unit 9 Normal Operation	4,641	10.9	17.9	6.2	9.5	1.7	16.6	50,701	83,294	1,764	44,090	7,843	76,956
Unit 9 Shutdown	200	322.0	37.5	34.6	9.5	1.7	16.6	64,392	7,495	6,924	1,900	338	3,316
Unit 9 Totals	**5,456**							**283,749**	**113,125**	**19,363**	**51,801**	**9,019**	**88,500**
Unit 11 Commissioning	121	116.7	44.1	10.0	7.9	0.4	3.5	14,120	5,331	1,208	962	43	425
Unit 11 Start-Up	480	89.8	30.4	7.4	5.0	0.2	3.5	43,111	14,580	3,533	2,400	97	1,686
Unit 11 Normal Operation	3,719	4.6	4.8	1.3	5.0	0.4	3.5	17,208	17,669	4,917	18,595	1,331	13,060
Unit 11 Shutdown	480	63.1	10.3	5.6	5.0	0.4	3.5	30,281	4,928	2,679	2,400	172	1,686
Unit 11 Totals	**4,800**							**104,719**	**42,509**	**12,337**	**24,357**	**1,643**	**16,856**
Unit 12 Commissioning	121	116.7	44.1	10.0	7.9	0.4	3.5	14,120	5,331	1,208	962	43	425
Unit 12 Start-Up	480	89.8	30.4	7.4	5.0	0.2	3.5	43,111	14,580	3,533	2,400	97	1,686
Unit 12 Normal Operation	3,719	4.6	4.8	1.3	5.0	0.4	3.5	17,208	17,669	4,917	18,595	1,331	13,060
Unit 12 Shutdown	480	63.1	10.3	5.6	5.0	0.4	3.5	30,281	4,928	2,679	2,400	172	1,686
Unit 12 Totals	**4,800**							**104,719**	**42,509**	**12,337**	**24,357**	**1,643**	**16,856**
Aux Boiler (25% load)	3,304	0.3	0.1	0.0	0.1	0.0	0.0	1,099	325	119	222	62	0
Aux Boiler (100% load)	33	1.3	0.4	0.1	0.3	0.1	0.0	44	13	5	9	2	0
Aux Boiler Totals	**3,337**							**1,143**	**338**	**124**	**231**	**64**	**0**
Total Annual Emissions (lb/year)								**494,331**	**198,480**	**44,161**	**100,745**	**12,370**	**122,212**
Total Annual Emissions (ton/year)								**247.2**	**99.2**	**22.1**	**50.4**	**6.2**	**61.1**

Table 3.1E-3
El Segundo Power Facility Modification

Commissioning Schedule for Unit 9

Day	Activity	Duration (hr)	GT Load (%)	Modeling Load (%)	Startup/Shutdown Emissions (lbs) NOx	CO	VOC	PM	Fuel Use (lbs)	Running Emissions (lbs) NOx	CO	VOC	PM	Fuel Use (lbs)	Total Emissions (lbs) NOx	CO	VOC	PM	Fuel Use (lbs)	Calculated Hourly Emissions (lbs/hr) NOx	CO	VOC	PM
1	GT Testing (FSNL, Excitation Test, Dummy Synch Checks)	8	0	FSNL	6	483	21	1	2474	370	30018	1289	92	153752	376	30501	1310	93	156226	47.0	3812.6	163.8	11.6
2	GT Testing @ 40% load	8	0-40	40	126	3712	105	12	35529	1475	13971	572	90	403519	1601	17683	677	102	439048	200.1	2210.4	84.6	12.8
3	Steam Blow/HRSG Tuning	12	0-25	25	69	2648	77	8	19888	1686	41064	892	136	462406	1755	43712	969	144	482294	146.3	3642.7	80.8	12.0
4	Steam Blow/HRSG Tuning	12	0-50	50	157	3971	120	15	48447	850	5176	593	96	697169	1007	9147	713	111	745616	83.9	762.3	59.4	9.3
5	Steam Blow	12	0-50	50	157	3971	120	15	48447	850	5176	593	96	697169	1007	9147	713	111	745616	83.9	762.3	59.4	9.3
6	Steam Blow restoration, install SCR/CO Catalyst	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
7	Steam Blow restoration, install SCR/CO Catalyst	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
8	Steam Blow restoration, install SCR/CO Catalyst	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
9	Steam Blow restoration, install SCR/CO Catalyst	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
10	Steam Blow restoration, install SCR/CO Catalyst	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
11	Steam Blow restoration, install SCR/CO Catalyst	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
12	Steam Blow restoration, install SCR/CO Catalyst	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
13	Steam Blow restoration, install SCR/CO Catalyst	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
14	Steam Blow restoration, install SCR/CO Catalyst	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
15	Steam Blow restoration, install SCR/CO Catalyst	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
16	Steam Blow restoration, install SCR/CO Catalyst	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
17	Steam Blow restoration, install SCR/CO Catalyst	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
18	Steam Blow restoration, install SCR/CO Catalyst	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
19	Steam Blow restoration, install SCR/CO Catalyst	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
20	Establish vacuum/HSRG Tuning/BOP Tuning	16	60	60	86	805	73	9	32811	153	104	63	128	1046636	239	908	136	137	1079447	14.9	56.8	8.5	8.6
21	Establish vacuum/BOP Tuning	16	60	60	86	805	73	9	32811	153	104	63	128	1046636	239	908	136	137	1079447	14.9	56.8	8.5	8.6
22	GT Load Test & Bypass Valve Tuning	16	60	60	86	805	73	9	32811	153	104	63	128	1046636	239	908	136	137	1079447	14.9	56.8	8.5	8.6
23	GT Load Test & Bypass Valve Tuning	16	60	60	86	805	73	9	32811	153	104	63	128	1046636	239	908	136	137	1079447	14.9	56.8	8.5	8.6
24	GT Load Test & Bypass Valve Tuning / Safety Valve Testing	12	75	75	87	805	74	10	41264	135	36	18	96	919646	222	842	92	106	960910	18.5	70.2	7.7	8.8
25	GT Base Load / Commissioning of Ammonia system	12	100	100	92	806	74	13	71104	169	46	23	104	1152480	260	852	97	117	1223584	21.7	71.0	8.1	9.8
26	GT Load Test & Bypass Valve Tuning	12	100	100	92	806	74	13	71104	169	46	23	104	1152480	260	852	97	117	1223584	21.7	71.0	8.1	9.8
27	No Operation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
28	Install Emissions Test Equipment	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
29	Bypass Operation / STG Initial Roll & Trip Test	10	0-60	60	86	805	73	9	32811	96	65	39	80	654147	182	869	113	89	686958	18.2	86.9	11.3	8.9
30	Bypass Operation / STG Load Test	16	0-60	60	86	805	73	9	32811	153	104	63	128	1046636	239	908	136	137	1079447	14.9	56.8	8.5	8.6
31	GT on Bypass / STG Load Test	16	0-100	100	92	806	74	13	71104	225	61	31	139	1536640	317	867	105	152	1607744	19.8	54.2	6.6	9.5
32	Combine Cycle testing / Drift Test	24	0-100	100	49	524	48	7	36789	338	91	46	208	2304961	386	615	93	215	2341750	16.1	25.6	3.9	9.0
33	Combine Cycle testing / Drift Test	24	100	100	43	282	27	6	34315	338	91	46	208	2304961	380	374	73	214	2339275	15.8	15.6	3.0	8.9
34	Emissions Tuning / Drift Test	12	50-100	100	92	806	74	13	71104	169	46	23	104	1152480	260	852	97	117	1223584	21.7	71.0	8.1	9.8
35	Emissions Tuning / Drift Test	12	50-100	100	92	806	74	13	71104	169	46	23	104	1152480	260	852	97	117	1223584	21.7	71.0	8.1	9.8
36	Pre-performance Testing / Drift Test	12	100	100	92	806	74	13	71104	169	46	23	104	1152480	260	852	97	117	1223584	21.7	71.0	8.1	9.8
37	Pre-performance Testing / Drift Test	12	100	100	92	806	74	13	71104	169	46	23	104	1152480	260	852	97	117	1223584	21.7	71.0	8.1	9.8
38	Pre-performance Testing / Drift Test	12	100	100	92	806	74	13	71104	169	46	23	104	1152480	260	852	97	117	1223584	21.7	71.0	8.1	9.8
39	RATA / Pre-performance Testing / Source Testing	15	100	100	92	806	74	13	71104	211	57	29	130	1440600	303	864	103	143	1511704	20.2	57.6	6.9	9.5
40	Pre-performance Testing / Source Testing	14	100	100	92	806	74	13	71104	197	53	27	122	1344560	289	860	101	134	1415664	20.6	61.4	7.2	9.6
41	Pre-performance Testing / Source Testing	12	50-100	100	92	806	74	13	71104	169	46	23	104	1152480	260	852	97	117	1223584	21.7	71.0	8.1	9.8
42	Remove Emissions Test Equipment	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
43	No Operation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
44	Water Wash & Performance preparation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
45	Water Wash & Performance preparation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
46	Performance Testing	24	100	100	92	806	74	13	71104	338	91	46	208	2304961	429	898	120	221	2376064	17.9	37.4	5.0	9.2
47	Performance Testing	24	100	100	92	806	74	13	71104	338	91	46	208	2304961	429	898	120	221	2376064	17.9	37.4	5.0	9.2
48	CALISO Certification	12	50-100	100	92	806	74	13	71104	169	46	23	104	1152480	260	852	97	117	1223584	21.7	71.0	8.1	9.8
49	CALISO Certification	12	100	100	92	806	74	13	71104	169	46	23	104	1152480	260	852	97	117	1223584	21.7	71.0	8.1	9.8
	Total =	415			2,590	33,316	2,140	323	1,530,579	9,902	97,021	4,812	3,589	34,287,432	12,478	130,337	6,952	3,911	35,818,008				
																		Average =		30.1	314.1	16.8	9.4
																		Maximum =		200.1	3812.6	163.8	12.8

Table 3.1E-4

El Segundo Power Facility Modification

Commissioning Schedule for Units 11 and 12

Activity	Duration (hr)	GT Load (%)	Modeling Load (%)	No. of Starts	Startup/Shutdown Emissions (lbs)				Fuel Use	Running Emissions (lbs)				Fuel Use	Total Emissions (lbs)				Fuel Use	Calculated Hourly Emissions (lbs/hr)			
					NOx	CO	VOC	PM	(lbs)	NOx	CO	VOC	PM	(lbs)	NOx	CO	VOC	PM	(lbs)	NOx	CO	VOC	PM
First Fire and Engine Idle Running	9	0	FSNL	16	562	2,360	182	96	125,195	9	757	253	3	169,013	571	3,117	435	99	294,208	63	346	48	11
Sychronization of the unit	8	0	FSNL	10	351	1,475	114	60	78,247	1	112	4	1	150,234	352	1,587	118	61	228,481	44	198	15	8
Tuning--Baseload Running	32	100	100	29	1,018	4,278	331	174	226,916	1,452	2,357	93	168	600,935	2,470	6,635	424	342	827,851	77	207	13	11
Commissioning of inlet fogging and ISI	12	0-25	50	9	316	1,328	103	54	70,422	87	600	24	12	225,351	403	1,927	126	66	295,773	34	161	11	5
SCR tuning	12	0-50	100	2	70	295	23	12	15,649	1,132	34	14	121	225,351	1,202	329	37	133	241,000	100	27	3	11
RATA Test	12	50	100	1	35	148	11	6	7,825	57	24	10	61	225,351	92	172	21	67	233,175	8	14	2	6
Performance test	12	50	100	1	35	148	11	6	7,825	57	24	10	61	225,351	92	172	21	67	233,175	8	14	2	6
24-hr reliability test	24	100	100	1	35	148	11	6	7,825	113	34	14	121	450,701	148	181	25	127	458,526	6	8	1	5
Total =	121				2,422	10,178	787	414	539,903	2,909	3,942	422	548	2,272,286	5,331	14,120	1,208	962	2,812,189				
																			Average =	44	117	10	8
																			Maximum =	100	346	48	11

Table 3.1E-5
El Segundo Power Facility Modification
CTG - Emission Factors

Emission Factors During the Commissioning Period			
	CO	**NOX**	**VOC**
Unit 9			
Emissions (lbs) =	130,337	12,478	6,952
Fuel Use (MMscf) =	796	796	796
Emission Factor (lbs/MMscf) =	163.71	15.67	8.73
Unit 11			
Emissions (lbs) =	14,120	5,331	1,208
Fuel Use (MMscf) =	63	63	63
Emission Factor (lbs/MMscf) =	225.88	85.28	19.33
Unit 12			
Emissions (lbs) =	14,120	5,331	1,208
Fuel Use (MMscf) =	63	63	63
Emission Factor (lbs/MMscf) =	225.88	85.28	19.33

APPENDIX 3.1F – BEST AVAILABLE CONTROL TECHNOLOGY (BACT) ANALYSIS

Evaluation of
Best Available Control Technology

El Segundo Power, LLC's facility modification is required to use best available control technology (BACT) on the combustion turbine generators (CTGs) and the auxiliary boiler for regulated pollutants, in accordance with the requirements of South Coast Air Quality Management District (SCAQMD, or District) rules and the federal Prevention of Significant Deterioration (PSD) requirements contained in District rules. For sources and pollutants subject to PSD, BACT is defined in SCAQMD Rule 1702(e):

> *(e) Best Available Control Technology (BACT) means the most stringent emission limitation or control technique which:*
>
> > *(1) has been achieved in practice for such permit unit category or class of source. For permit units not located at a major stationary source, a specific limitation or control technique shall not apply if the owner or operator of the proposed sources demonstrates to the satisfaction of the Executive Officer that such limitation or control technique is not attainable for that permit unit; or*
> >
> > *(2) is contained in any State Implementation Plan (SIP) approved by the Environmental Protection Agency (EPA) for such permit unit category or class of source. A specific limitation or control technique shall not apply if the owner or operator of the proposed source demonstrates to the satisfaction of the Executive Officer that such limitation or control technique is not presently achievable; or*
> >
> > *(3) is any other emission control technique, including process and equipment changes of basic and control equipment, found by the Executive Officer to be technologically feasible and cost-effective for such class or category of sources or for a specific source. No emissions limitation or control technique, the application of which would result in emissions from a new or modified source in excess of the amount allowable under applicable new source performance standards specified in Regulation IX of these Rules and Regulations or promulgated by the EPA pursuant to Section III of the Clean Air Act, may be considered BACT.*

The regulated pollutants for which the federal PSD BACT requirement is applicable are nitrogen oxides (NOx), carbon monoxide (CO), and greenhouse gases (GHG).

BACT for nonattainment pollutants is defined in SCAQMD Rule 1302(h):

> *(h) BEST AVAILABLE CONTROL TECHNOLOGY (BACT) means the most stringent emission limitation or control technique which:*

(1) has been achieved in practice for such category or class of source; or

(2) is contained in any state implementation plan (SIP) approved by the United States Environmental Protection Agency (EPA) for such category or class of source. A specific limitation or control technique shall not apply if the owner or operator of the proposed source demonstrates to the satisfaction of the Executive Officer or designee that such limitation or control technique is not presently achievable; or

(3) is any other emission limitation or control technique, found by the Executive Officer or designee to be technologically feasible for such class or category of sources or for a specific source, and cost-effective as compared to measures as listed in the Air Quality Management Plan (AQMP) or rules adopted by the District Governing Board.

The District NSR rules require BACT for NOx; sulfur dioxide (SO_2); volatile organic compounds (VOC); particulate (PM_{10} and $PM_{2.5}$); and ammonia. The BACT analyses required under both New Source Review (NSR) and PSD programs are similar, and are presented here. The emission rates and control technologies determined to be BACT for this project are discussed in detail in the following sections. For the CTGs, separate determinations are provided for normal operation and startup/shutdown operation.

Steps in a Top-Down BACT Analysis

Step 1 – Identify All Possible Control Technologies

The first step in a top-down analysis is to identify, for the emissions unit and pollutant in question, all available control options. Available control options are those air pollution control technologies or techniques, including alternate basic equipment or processes, with a practical potential for application to the emissions unit in question. The control alternatives should include not only existing controls for the source category in question, but also, through technology transfer, controls applied to similar source categories and gas streams.

BACT must be at least as stringent as what has been achieved in practice (AIP) for a category or class of source. Additionally, EPA guidelines require that a technology that is determined to be AIP for one category of source be considered for transfer to other source categories. There are two types of potentially transferable control technologies: (1) exhaust stream controls, and (2) process controls and modifications. For the first type, technology transfer must be considered between source categories that produce similar exhaust streams. For the second type, technology transfer must be considered between source categories with similar processes.

Candidate control options that do not meet basic project requirements (i.e., alternative basic designs that "redefine the source") are eliminated at this step.

Step 2 – Eliminate Technologically Infeasible Options

To be considered, the candidate control option must be technologically feasible for the application being reviewed.

Step 3 – Rank Remaining Control Options by Control Effectiveness

All feasible options are ranked in the order of decreasing control effectiveness for the pollutant under consideration. In some cases, a given control technology may be listed more than once, representing different levels of control (e.g., the use of SCR for control of NOx may be evaluated at 2 and 2.5 parts per million by volume, dry [ppmvd]). Any control option less stringent than what has been already achieved in practice for the category of source under review must also be eliminated at this step.

Step 4 – Evaluate Most Effective Control Technology Considering Environmental, Energy, and Cost Impacts

To be required as BACT, the candidate control option must be cost effective, considering energy, environmental, economic, and other costs. The most stringent control technology for control of one pollutant may have other undesirable environmental or economic impacts. The purpose of Step 4 is to either validate the suitability of the top control option or provide a clear justification as to why that option should not be selected as BACT.

Once all of the candidate control technologies have been ranked, and other impacts have been evaluated, the most stringent candidate control technology is deemed to be BACT, unless the other impacts are unacceptable.

Step 5 – Determine BACT/Present Conclusions

BACT is determined to be the most effective control technology subject to evaluation, and not rejected as infeasible or having unacceptable energy, environmental, or cost impacts.

BACT for the Simple-Cycle CTGs: Normal Operations

NOx EMISSIONS

Step 1 – Identify All Possible Control Technologies

The emissions unit for which BACT is being considered is a nominal 60 MW gas turbine operating in simple cycle.

Potential control technologies were identified by searching the following sources for determinations pertaining to combustion gas turbines:

- SCAQMD BACT Guidelines;
- San Joaquin Valley Air Pollution Control District (SJVAPCD) BACT Clearinghouse;
- Bay Area Air Quality Management District (BAAQMD) BACT Guidelines;
- EPA Reasonably Available Control Technology (RACT)/BACT/ Lowest Achievable Emission Rate (LAER) Clearinghouse;
- Other district and state BACT Guidelines; and
- BACT/LAER requirements in New Source Review permits issued by a local air district[1] or other air pollution control agency.

Outlined below are the technologies for control of NOx that were identified.

- A Selective Catalytic Reduction (SCR) system capable of continuously complying with a limit of 2.5 ppmvd @15% oxygen (O_2) (1-hour average).
- An EMx (formerly SCONOx) system capable of continuously complying with a limit of 2.5 ppmvd @15% O_2 (1-hour average).
- Alternative Basic Equipment:
    - Renewable Energy Source (e.g., solar, wind, etc.)
    - Combined-Cycle Turbine

It should be noted that the use of renewable energy in lieu of a simple-cycle gas turbine would "redefine the source." Renewable energy facilities require significantly more land to construct, and need to be located in areas with very specific characteristics. Wind and solar facilities have power generation profiles that cannot match demand; conventional power plants are needed in order to follow demand. The capital costs for wind or solar facilities are substantially higher than for a comparable conventional facility, making financing of such a project significantly different. Because these technologies would redefine the source, they are eliminated in this step of the analysis. Even if they were not eliminated in Step 1, solar and wind facilities require much more land than is available at the project site, and renewable energy alternatives would be eliminated in Step 2 as technologically infeasible.

The use of a combined-cycle turbine instead of the proposed simple-cycle turbines would also redefine the project. The project already includes a combined-cycle turbine for that portion of the anticipated operating profile that would be well served by such equipment. The simple-cycle turbines are needed to effectively handle variable loads and provide black start capability.

[1] Any Air Quality Management District or Air Pollution Control District in California.

Step 2 – Eliminate Technologically Infeasible Options

Exhaust Stream Controls

The most recent NOx BACT listings for aeroderivative simple-cycle combustion turbines in this size range are summarized in Table 1. The most stringent NOx limit in these recent BACT determinations is a 2.5 ppm[2] limit averaged over a 1-hour averaging period, excluding startups and shutdowns. This level is achieved using dry low-NOx combustors and SCR.

Table 1
Recent NOx BACT Determinations for Simple-Cycle Combustion Turbines[a]

Facility	District	NOx Limit[b]	Averaging Period	Control Method Used	Date Permit Issued	Source
TID Almond 2 Power Plant	SJVAPCD	2.5 ppmvd	1 hr	Water injection and SCR	2/16/2010	FDOC
Miramar Energy Facility II	SDCAPCD	2.5 ppmvd	3 hrs	Water injection and SCR	11/4/08	ATC
Starwood Midway Firebaugh/Panoche	SJVAPCD	2.5 ppmvd	1 hr	Water injection and SCR	9/5/07 (FDOC)	CEC Siting Div website
EIF Panoche	SJVAPCD	2.5 ppmvd	1 hr	Water injection and SCR	7/13/07 (FDOC)	CEC Siting Div website
San Francisco Electric Reliability Project	BAAQMD	2.5 ppmvd	1 hr	Water injection and SCR	2/8/06 (FDOC)	CEC Siting Div website
EI Colton	SCAQMD	3.5 ppmvd	3 hrs	Water injection and SCR	1/10/03	SCAQMD website
MID Ripon	SJVAPCD	2.5 ppmvd	3 hrs	Water injection and SCR	2004	ATC

Note:
a. All projects listed here utilize GE LM6000-model units except Starwood Midway, which utilizes P&W FT8-3 SwiftPacs, and EIF Panoche, which uses GE LMS 100 CTGs.
b. All concentrations expressed as parts per million by volume dry, corrected to 15% O_2.

SCONOx is a NOx reduction system produced by Goal Line Environmental Technologies. It is now distributed by EmeraChem as EMx. This system uses a single catalyst to oxidize both NO and CO, a second catalyst system to absorb NO_2, and then a regeneration system to convert the NO_2 to N_2 and water vapor. The EMx system does

[2] All turbine/HRSG exhaust emissions concentrations shown are by volume, dry corrected to 15% O_2.

not use ammonia as a reagent. The EMx process has been demonstrated in practice on smaller gas turbines, including Redding Electric Utility's (REU) Units 5 and 6, a 43-MW Alstom GTX100 and 45 MW Siemens SGT 800 combined-cycle gas turbines, respectively. While the technology has never been demonstrated on a gas turbine the size of the Trent 60 or on a simple-cycle gas turbine, the technology is considered by the manufacturer to be scalable.

The SCR system uses ammonia injection to reduce NOx emissions. SCR systems have been widely used in simple-cycle gas turbine applications of all sizes. The SCR process involves the injection of ammonia into the flue gas stream via an ammonia injection grid upstream of a reducing catalyst. The ammonia reacts with the NOx in the exhaust stream to form N_2 and water vapor. The catalyst does not require regeneration, but must be replaced periodically; typical SCR catalyst lifetimes are in excess of three years.

Either SCR or EMx technology is capable of achieving a NOx emission level of 2.5 ppmvd @ 15% O_2. Neither has been demonstrated to consistently achieve lower emission levels in simple-cycle turbines in demand-response service.

Step 3 – Rank Remaining Control Technologies by Control Effectiveness

Both SCR and EMx technologies, each in combination with combustion controls, are capable of achieving a NOx emission level of 2.5 ppmvd @ 15% O_2. They are therefore ranked together in terms of control effectiveness.

Step 4 – Evaluate the Most Effective Control Technology Considering Environmental, Energy, and Cost Impacts

The use of SCR will result in ammonia emissions due to an allowable ammonia slip limit of 5 ppmvd @ 15% O_2. A health risk screening analysis of the proposed project using air dispersion modeling will be prepared to demonstrate the acute health hazard index and the chronic health hazard index each to be much less than 1, based on an ammonia slip limit of 5 ppmv @ 15% O_2. In accordance with the District's Toxics program and currently accepted practice, a hazard index below 1.0 is not considered significant. Therefore, the toxic impact of the ammonia slip resulting from the use of SCR is deemed to be not significant, and is not a sufficient reason to eliminate SCR as a control alternative.

A second potential environmental impact that may result from the use of SCR involves the storage and transport of aqueous or anhydrous ammonia.[3] Although ammonia is toxic if swallowed or inhaled and can irritate or burn the skin, eyes, nose, or throat, it is a commonly used material that is typically handled safely and without incident. The project operator will be required to develop and maintain a Risk Management Plan (RMP) and to implement a Risk Management Program to prevent accidental releases of ammonia. The RMP provides information on the hazards of the substance handled at the facility and the programs in place to prevent and respond to accidental releases. The

[3] The Project proposes to use the less concentrated, safer aqueous form of ammonia.

accident prevention and emergency response requirements reflect existing safety regulations and proven industry safety codes and standards. Thus, the potential environmental impact due to aqueous ammonia use at the Project is minimal and does not justify the elimination of SCR as a control alternative.

Regeneration of the EMx catalyst is accomplished by passing hydrogen gas over an isolated catalyst module. The hydrogen gas is generated by reforming steam, so steam would be required. This would require the production of additional steam by the auxiliary boiler, or would decrease the plant electrical output by diverting steam produced by the combined cycle unit's HRSG from the steam turbine to the hydrogen reformer. In either case, there would be additional natural gas consumption, and increased emissions, per megawatt hour of electricity produced.

"Achieved in Practice" Criteria

SCAQMD has established formal criteria for determining when emission control technologies should be considered achieved in practice (AIP) for the purposes of BACT determinations. The criteria include the elements outlined below.

- Commercial Availability: At least one vendor must offer this equipment for regular or full-scale operation in the United States. A performance warranty or guarantee must be available with the purchase of the control technology, as well as parts and service.

- Reliability: All control technologies must have been installed and operated reliably for at least six months. If the operator did not require the basic equipment to operate daily, then the equipment must have at least 183 cumulative days of operation. During this period, the basic equipment must have operated (1) at a minimum of 50% design capacity; or (2) in a manner that is typical of the equipment in order to provide an expectation of continued reliability of the control technology.

- Effectiveness: The control technology must be verified to perform effectively over the range of operation expected for that type of equipment. If the control technology will be allowed to operate at lesser effectiveness during certain modes of operation, then those modes of operation must be identified. The verification shall be based on a performance test or tests, when possible, or other performance data.

Each of these criteria is discussed separately below for SCR and for EMx.

<u>SCR Technology</u> – SCR has been achieved in practice at numerous combustion turbine installations throughout the world. There are numerous aeroderivative simple-cycle gas turbine projects that limit NOx emissions to 2.5 ppm, as shown in Table 1. An evaluation of the proposed AIP criteria as applied to the achievement of 2.5 ppm, and to extremely low NOx levels (below 2.5 ppm) using SCR technology, is summarized below.

- Commercial Availability: Turbine-out NOx from aeroderivative gas turbines is generally 25 ppm. Achieving a controlled NOx limit below 2.5 ppm would require SCR technology to achieve reductions greater than 90 percent. Furthermore, because of the relatively high temperature of exhaust from simple-cycle turbines compared with combined-cycle units, there is a more limited selection of SCR technology available. Consequently, it is not clear that this criterion is satisfied for limits below 2.5 ppm for aeroderivative gas turbines. As shown in Table 1 above, this criterion is satisfied for aeroderivative gas turbines at a 2.5 ppm permit level.

- Reliability: SCR technology has been shown to be capable of achieving NOx levels consistent with a 2.5 ppm permit limit during extended, routine operations at several commercial power plants. There are no reported adverse effects of operation of the SCR system at these levels on overall plant operation or reliability. There has been no demonstration of operation at levels below 2.5 ppm during extended, routine operation of simple-cycle aeroderivative gas turbines; consequently, this criterion is not satisfied for NOx limits below 2.5 ppm.

- Effectiveness: SCR technology has been demonstrated to achieve NOx levels of 2.5 ppm with aeroderivative turbines, but not at lower limits for this generating technology. Short-term excursions have resulted in NOx concentrations above the permitted level of 2.5 ppm; however, these excursions have not been associated with diminished effectiveness of the SCR system. Rather, these excursions have been associated with SCR inlet NOx levels in excess of those for which the SCR system was designed. Consequently, this criterion is satisfied at a NOx limit of 2.5 ppm, but not at lower NOx limits.

- Conclusion: SCR technology capable of achieving NOx levels of 2.5 ppm is considered to be achieved in practice. The permit limits for the proposed project CTGs include a NOx limit of 2.5 ppm. This proposed limit is consistent with the available data. The AIP criteria are not met for SCR on simple-cycle aeroderivative gas turbines at NOx limits lower than 2.5 ppm.

<u>EMx Technology</u> – EMx has been demonstrated in service in five applications: the Sunlaw Federal cogeneration plant, the Wyeth BioPharma cogeneration facility, the Montefiore Medical Center cogeneration facility, the University of California San Diego facility, and the City of Redding Power Plant. The combustion turbines at these facilities are much smaller than for the proposed project turbine, and none of the existing installations are simple-cycle turbines. The largest installation of the EMx system is at the Redding Power Plant. The Redding Power Plant includes two combined-cycle combustion turbines—a 43 MW Alstom GTX100 with a permitted NOx emission rate of 2.5 ppm, and a 45 MW Siemens SGT 800 with a permitted NOx emission rate of 2.0 ppmvd.

A review of NOx continuous emissions monitoring (CEM) data obtained from the EPA's Acid Rain program website[4] indicates a mean NOx level for the Redding Unit 5 of less than 1.0 ppm during the period from 2002 to 2007. After the first year of operation, Unit 5 has experienced only a few hours of non-compliance per year (fewer than 0.1% of the annual operating hours exceed that plant's NOx permit limit of 2.5 ppm). The experience at the City of Redding Plant indicates the ability of the EMx system to control NOx emissions to levels of 2.5 ppm. These data do not indicate the ability to consistently achieve NOx levels below 2.0 ppm, notwithstanding the lower annual average emission rate. This is due to the cyclical nature of EMx NOx levels between plant shutdowns and scheduled catalyst cleanings. Redding Unit 6 started up on October 2011; there are not sufficient operating data available to draw conclusions regarding its performance.

Based on this information, the following paragraphs evaluate the proposed AIP criteria as applied to the achievement of low NOx levels (2.5 ppm) using EMx technology.

- Commercial availability: While a proposal has not been sought, presumably EmeraChem Power would offer standard commercial guarantees for the proposed project. Consequently, this criterion is expected to be satisfied. However, no EMx units are currently in operation on simple-cycle units.

- Reliability: As discussed above, based on a review of the CEM data for Redding Unit 5, the EMx system complied with the 2.5 ppm NOx permit limit but with a few hours each year of excess emissions (approximately 3% of annual operating hours following the first year, and approximately 2% following the second year, dropping to approximately 0.1% after 4 years). This level of performance was also associated with some significant operating and reliability issues. According to a June 23, 2005 letter from the Shasta County Air Quality Management District,[5] repairs to the EMx system began shortly after initial startup and have continued during several years of operation. Redesign of the EMx system was required due to a problem with the reformer reactor combustion production unit that led to sulfur poisoning of the catalyst, despite the sole use of low-sulfur, pipeline quality natural gas as the turbine fuel. In addition, the EMx system catalyst washings had to occur at a frequency several times higher than anticipated during the first three years of operation, which resulted in substantial downtime of the combustion turbine. Since the REU installation is the most representative of all of the EMx-equipped combustion turbine facilities for comparison to the proposed Project, the problems encountered at REU bring into question the reliability of the EMx system for the proposed project. In addition, the EMx unit has not been demonstrated in use in a simple cycle application.

- Effectiveness: The EMx system at REU Unit 5 has recently been able to demonstrate compliance with a NOx level of 2.0 ppm, and the new REU Unit 6 has been permitted with a 2.0 ppm NOx limit. However, there is not sufficient

[4] Available at *http://camddataandmaps.epa.gov/gdm/index.cfm?fuseaction=prepackaged.results*
[5] Letter dated June 23, 2005, from Shasta County Air Quality Management District to the Redding Electric Utility regarding Unit 5 demonstration of compliance with its NOx permit limit.

operating experience with REU Unit 6 to conclude that 2.0 ppm is reliably achieved in practice for EMx, and there are no EMx-equipped facilities on simple-cycle facilities in demand-response service. In addition, this is a combined cycle unit. Consequently, due to the lack of actual performance data, there is some question regarding the effectiveness of the EMx systems on simple-cycle, demand-response combustion turbine projects.

- Conclusion: EMx systems are capable of achieving NOx levels of 2.5 ppm and less. However, the operating history at the Redding Power Plant does not support a conclusion that this technology is achieved in practice for simple-cycle, demand-response turbines, based on SCAQMD guidelines.

Summary of Achieved in Practice Evaluation

SCR's capability to consistently achieve 2.5 ppmvd NOx (1-hour average) in large turbines has been demonstrated by numerous installations. EMx's ability to consistently achieve 2.5 ppmvd in large turbines has not been demonstrated, nor has the technology been demonstrated in simple-cycle, demand-response service. An emission level of 2.5 ppm NOx has therefore been achieved in practice, and any BACT determination must be at least as stringent as that.

Technologically Feasible/Cost Effective Criterion

No candidate technology with lower emission levels than those achieved in practice has been identified.

<u>Step 5 – Determine BACT/Present Conclusions</u>

BACT must be at least as stringent as the most stringent level achieved in practice, federal NSPS, or district prohibitory rule. Based upon the results of this analysis, the NOx BACT determination of 2.5 ppmvd @ 15% O_2 on a 1-hour average basis made for recently permitted simple-cycle turbine projects in SCAQMD and elsewhere reflects the most stringent NOx emission limit that has been achieved in practice. No more stringent level has been suggested as being technologically feasible. Therefore, BACT for NOx for this application is any technology capable of achieving 2.5 ppmvd @ 15% O_2 on a 1-hour average basis.

Both SCR and EMx are expected to achieve the proposed BACT NOx emission limit of 2.5 ppmvd @ 15% O_2 averaged over one hour. However, concerns remain regarding the long-term effectiveness of EMx as a control technology because the technology has not been demonstrated on the turbine used in this project, in a simple-cycle demand-response application. For this reason, SCR has been selected as the NOx control technology to be used for the Project.

The Project facility will be designed to meet a NOx level of 2.5 ppmvd @ 15% O_2 on a 1-hour average basis using SCR.

CO EMISSIONS

Step 1 – Identify All Possible Control Technologies

CO emitted from natural gas-fired turbines is the result of incomplete combustion of fuel. Use of an oxidation catalyst is generally considered BACT for CO. Alternative basic equipment—including renewable energy sources, such as solar and wind—was already discussed above (Step 1 for NOx BACT on the CTGs). For the same reasons, solar, wind and other renewable energy sources are rejected as CO BACT for this application.

Step 2 – Eliminate Technologically Infeasible Options

The only technology under consideration is use of an oxidation catalyst in combination with combustion controls. This combination of technologies has been demonstrated to be feasible in many applications. No other technologies have been identified that are capable of achieving the same level of control. As a result, the goal of the rest of this analysis is to determine the appropriate emission limit that constitutes BACT for this application.

The California Air Resources Board's (CARB's) BACT guidance document for electric generating units rated at greater than 50 MW[6] indicates that BACT for the control of CO emissions for simple-cycle power plants is 6 ppmvd @ 15% O_2.

The BAAQMD's BACT guidelines specify that, for natural gas-fired simple-cycle combustion gas turbines larger than 40 MW, a CO limit of 6 ppmvd @ 15% O_2 has been "achieved in practice."

The SJVAPCD's BACT guidelines contain a determination for gas turbines rated at larger than 47 MW with variable load and without heat recovery. The SJVAPCD concluded that a CO exhaust concentration of 0.024 lb/MMBtu (11 ppmvd @ 15% O_2) constituted BACT that is considered technologically feasible.

A summary of recent CO BACT determinations is shown in Table 2.

Published prohibitory rules from the BAAQMD, Sacramento Metropolitan Air Quality Management District (SMAQMD), San Diego County Air Pollution Control District (SDCAPCD), SJVAPCD, and SCAQMD were reviewed to identify the CO standards that govern existing natural gas-fired simple-cycle combustion gas turbines. The SJVAPCD prohibitory rule is the only one that includes an emission limit for CO (200 ppmv @15% O_2). The applicable NSPS (40 CFR 60 Subpart KKKK) does not include a CO limit.

[6] CARB, "Guidance for Power Plant Siting and Best Available Control Technology," September 1999.

Table 2
Recent CO BACT Determinations for Simple-Cycle Combustion Turbines[a]

Facility	District	CO Limit[b]	Averaging Period	Control Method Used	Date Permit Issued	Source
TID Almond 2 Power Plant	SJVAPCD	4.0 ppmvd	3 hr	Oxidation Catalyst	2/16/2010	FDOC
Starwood Midway Firebaugh/Panoche	SJVAPCD	6.0 ppmvd	3 hr	Oxidation Catalyst	9/5/07 (FDOC)	CEC Siting Div website
EIF Panoche	SJVAPCD	6.0 ppmvd	3 hr	Oxidation Catalyst	7/13/07 (FDOC)	CEC Siting Div website
San Francisco Electric Reliability Project	BAAQMD	4.0 ppmvd	3 hr	Oxidation Catalyst	2/8/06 (FDOC)	CEC Siting Div website

Notes:

a. All projects listed here utilize GE LM6000-model units except Starwood Midway, which utilizes P&W FT8-3 SwiftPacs and EIF Panoche, which uses GE LMS 100 CTGs.

b. All concentrations expressed as parts per million by volume dry, corrected to 15% O_2.

Step 3 – Rank Remaining Control Technologies by Control Effectiveness

The control technologies under consideration are ranked as follows:

- Oxidation catalyst unit capable of achieving 4 ppmvd @ 15% O_2
- Oxidation catalyst unit capable of achieving 6 ppmvd @ 15% O_2

Step 4 – Evaluate the Most Effective Control Technology Considering Environmental, Energy, and Cost Impacts

This step evaluates any source-specific environmental, energy, or economic impacts that demonstrate that the top alternative listed in the previous step is inappropriate as BACT.

The applicant has proposed to meet 4 ppmc limit on a 1-hour average basis. Because the applicant has proposed to use the highest ranked technology under consideration, the analysis ends at this step.

Step 5 – Determine BACT/Present Conclusions

BACT must be at least as stringent as the most stringent achieved in practice, required in a federal NSPS or district prohibitory rule, or considered technologically feasible. Based upon the results of this analysis, the CO emission limit of 4.0 ppmvd @ 15% O_2 is considered to be BACT for the proposed project.

VOC EMISSIONS

Step 1 – Identify All Possible Control Technologies

Most VOCs emitted from natural gas-fired turbines are the result of incomplete combustion of fuel. Therefore, most of the VOCs are methane and ethane, which are not effectively controlled by an oxidation catalyst. However, oxidation catalyst technology designed to control CO can also provide some degree of control of VOC emissions, especially the more complex and toxic compounds formed in the combustion process. Therefore, use of an oxidation catalyst is generally considered BACT for VOC.

Alternative basic equipment—including renewable energy sources, such as solar and wind—was already discussed above (Step 1 for NOx BACT on the CTGs). For the same reasons, solar, wind and other renewable energy sources are rejected as VOC BACT for this application.

Step 2 – Eliminate Technologically Infeasible Options

The only technology under consideration is use of an oxidation catalyst in combination with combustion controls. This combination of technologies has been demonstrated to be feasible in many applications. No other technologies have been identified that are capable of achieving the same level of control. As a result, the goal of the rest of this analysis is to determine the appropriate emission limit that constitutes BACT for this application.

As shown in Table 3, CARB's BACT guidance document for electric generating units rated at greater than 50 MW7 indicates that BACT for the control of VOC emissions for simple-cycle power plants is 2 ppmvd @ 15% O_2.

Table 3
CARB BACT Guidance For Power Plants

Pollutant	BACT
Nitrogen Oxides	2.5 ppmv @ 15% O_2 (1-hour average) 2.0 ppmv @ 15% O_2 (3-hour average)
Sulfur Dioxide	Fuel sulfur limit of 1.0 grains/100 scf
Carbon Monoxide	Nonattainment areas: 6 ppmv @ 15% O_2 (3-hour average) Attainment areas: District discretion
VOC	2 ppmv @ 15% O_2 (3-hour average)
NH_3	5 ppmv @ 15% O_2 (3-hour average)
PM_{10}	Fuel sulfur limit of 1.0 grains/100 scf

[7] CARB, "Guidance for Power Plant Siting and Best Available Control Technology," September 1999.

The BAAQMD's BACT guidelines do not include a BACT determination for simple-cycle turbines greater than 40 MW.

The SJVAPCD's BACT guidelines contain a determination for gas turbines rated at larger than 50 MW with variable load and without heat recovery. The SJVAPCD concluded that a VOC exhaust concentration of 0.007 lb/MMBtu (6 ppmvd @ 15% O_2) constituted BACT that had been achieved in practice.

Published prohibitory rules from the BAAQMD, SMAQMD, SDCAPCD, SJVAPCD, and SCAQMD were reviewed to identify the VOC standards that govern existing natural gas-fired simple-cycle combustion gas turbines. None of the prohibitory rules for combustion gas turbines specify an emission limit for VOC. The applicable NSPS (40 CFR 60 Subpart KKKK) does not include a VOC limit.

This "top-down" VOC BACT analysis will consider the following VOC emission limitations:

- 2 ppmvd @ 15% O_2

<u>Step 3 – Rank Remaining Control Technologies by Control Effectiveness</u>

The control technologies under consideration are ranked as follows:

- 2 ppmvd @ 15% O_2

<u>Step 4 – Evaluate the Most Effective Control Technology Considering Environmental, Energy, and Cost Impacts</u>

This step evaluates any source-specific environmental, energy, or economic impacts that demonstrate that the top alternative listed in the previous step is inappropriate as BACT.

The applicant has proposed to meet a 2 ppmvd limit on a 1-hour average basis. This level meets BACT.

<u>Step 5 – Determine BACT/Present Conclusions</u>

BACT must be at least as stringent as the most stringent achieved in practice, required in a federal NSPS or district prohibitory rule, or considered technologically feasible. Based upon the results of this analysis, the VOC emission limits of 2.0 ppmvd @ 15% O_2 are considered to be BACT for the proposed project.

SULFUR OXIDE EMISSIONS

Step 1 – Identify All Possible Control Technologies

Natural gas fired combustion turbines have inherently low SOx emissions due to the small amount of sulfur present in the fuel. With typical pipeline quality natural gas sulfur contents well below 1 grain/100 scf, the SOx emissions for natural gas fired combustion turbines are orders of magnitude less than oil-fired turbines. Firing by natural gas, and the resulting control of SOx emissions, has been used by numerous combustion turbines throughout the world. Due to the prevalence of the use of natural gas to control SOx emissions from combustion turbines, only an abbreviated discussion of post-combustion controls will be addressed in this section.

Post-combustion SOx control systems include dry and wet scrubber systems. These types of systems are typically installed on high SOx emitting sources such as coal-fired power plants. Post-combustion control systems for combustion turbines also include ESx catalyst systems. These systems trap the sulfur in the exhaust stream on an ESx catalyst. During a regeneration process, the sulfur is removed from the ESx catalyst and is either reintroduced back into the exhaust stream or sent to a sulfur scrubbing system. If the sulfur removed from the ESx catalyst is reintroduced back into the exhaust stream, there is no SOx control associated with the system.

Step 2 – Eliminate Technically Infeasible Options

All of the control options discussed above are technically feasible.

Step 3 – Rank Remaining Control Technologies by Control Effectiveness

The typical SOx control level for a well-designed wet or dry scrubber installed on a coal fired boiler ranges from approximately 70% to 90%,[8] with some installations achieving even higher control levels. According to EmeraChem literature,[9] the ESx system is capable of removing approximately 95% of the SOx emissions from the exhaust stream of natural gas fired combustion turbines. With the sulfur scrubber option, during the regeneration cycle of the ESx system the sulfur captured on the ESx catalyst is sent to a sulfur scrubbing unit. A high-efficiency sulfur scrubbing unit would achieve a control level similar to that of the wet/dry scrubbers discussed above.

Step 4 – Evaluate Most Effective Controls and Document Results

The use of low sulfur content pipeline natural gas has been achieved in practice at numerous combustion turbine installations throughout the world, and the use of this fuel minimizes SOx emissions. While it would be theoretically feasible to install some type of post-combustion control such as a dry/wet scrubber system or an ESx catalyst with a

[8] Air Pollution Control Manual, Air and Waste Management Association, Second Edition, page 206.
[9] High Performance EMx Emissions Control Technology for Fine Particles, NOx, CO, and VOCs from Combustion Turbines and Stationary IC Engines, by Steven DeCicco and Thomas Girdlestone, EmeraChem Power, June 2008, page 19.

sulfur scrubber on a natural gas fired turbine, due to the inherently low SOx emissions associated with the use of natural gas, these systems are not cost effective and regulatory agencies do not require them. Consequently, no further discussion of post-combustion SOx control is necessary.

Step 5 – Determine BACT/Present Conclusions

The SOx control method for the proposed ESPFM is the use of pipeline-quality natural gas. Consequently, the proposed project is consistent with BACT requirements.

PM/PM_{10}/$PM_{2.5}$ EMISSIONS

Step 1 – Identify All Possible Control Technologies

Alternative basic equipment—including renewable energy sources, such as solar and wind—has also been identified as a technology for the control of PM/PM_{10}/$PM_{2.5}$ emissions. Such alternative basic equipment was already discussed above (Step 1 for NOx BACT on the CTGs/HRSGs). For the same reasons, solar, wind and other renewable energy sources are rejected as PM_{10}/$PM_{2.5}$ BACT for this application.

Achievable Controlled Levels and Available Control Options

PM emissions from natural gas-fired turbines primarily result from carryover of noncombustible trace constituents in the fuel. PM emissions are minimized by using clean-burning pipeline quality natural gas with low sulfur content.

The CARB BACT Clearinghouse, as well as the BAAQMD and SJVAPCD BACT guidelines, identifies the use of natural gas as the primary fuel as "achieved in practice" for the control of PM_{10} for combustion gas turbines.

CARB's BACT guidance document for stationary gas turbines used for power plant configurations[10] indicates that BACT for the control of PM emissions is an emission limit corresponding to natural gas with a fuel sulfur content of no more than 1 grain/100 standard cubic foot.

Title 40 CFR Part 60 Subpart KKKK contains the applicable NSPS for combustion gas turbines. Subpart KKKK does not regulate PM_{10} emissions.

Published prohibitory rules from the SCAQMD, SJVAPCD, SMAQMD, and SDCAPCD were reviewed to identify the PM_{10} standards that govern natural gas-fired combustion gas turbines. These prohibitory rules do not regulate PM_{10} emissions.

[10] Ibid, Table I-2.

Step 2 – Eliminate Technologically Infeasible Options

As discussed above, solar, wind and other renewable energy alternatives are not considered technologically feasible for this application.

Step 3 – Rank Remaining Control Technologies by Control Effectiveness

No control technology other than use of clean natural gas fuel has been identified for this application.

Step 4 – Evaluate the Most Effective Control Technology Considering Environmental, Energy, and Cost Impacts

No control technology other than use of clean natural gas fuel has been identified for this application.

Step 5 – Determine BACT/Present Conclusions

Based upon the results of this analysis, the use of natural gas as the primary fuel source constitutes BACT for PM_{10} emissions from combustion gas turbines. Through the use of natural gas, the turbine is expected to be able to meet the proposed emission limit of 5.0 lbs/hr.

GHG EMISSIONS

Step 1 – Identify All Possible Control Technologies

EPA has indicated in its guidance on BACT for GHGs[11] that the following types of controls must be considered in determining BACT for GHGs:

- Inherently lower-emitting processes/practices/designs;
- Add-on controls; and
- Combinations of inherently lower emitting processes/practices/designs and add-on controls.[12]

EPA further acknowledges that the requirement to consider inherently lower-emitting processes/practices/designs does not require a fundamental redesign of the nature of the source. This indicates that lower-emitting process/practices/designs that do not achieve the goals, objectives, or purposes of the project may be considered technologically infeasible as BACT for a project.

[11] EPA, *PSD and Title V Permitting Guidance for Greenhouse Gases*, November 2010, p. 33
[12] Ibid, p.27.

The following control technologies were identified as potentially "available" for ESPFM:

- Renewable energy technology (solar or wind),
- Alternative generating technologies,
- Alternative fuels,
- Energy efficiency, and
- Carbon capture and storage.

Renewable Energy Technology

These technologies, and the basis for eliminating them from the BACT analysis, are discussed above under the NOx BACT evaluation.

<u>Step 2 – Eliminate Technologically Infeasible Options</u>

EPA considers a technology to be technically feasible if it has been demonstrated in practice on a similar facility, or is available and applicable to the source type under review. EPA considers a technology to be "available" where it can be obtained through commercial channels or is otherwise available within the common meaning of the term (e.g., it has been demonstrated in practice on a comparable, but not necessarily similar, facility). A technology is applicable if it may reasonably be expected to be successfully applied to the source type under review.

Alternative Fossil Fuel Generating Technologies

Alternative fossil fuel generating technologies such as reciprocating internal combustion engines, boilers, and combined-cycle combustion turbines may be considered as potentially technologically feasible alternatives to the proposed use of simple-cycle combustion turbine technology. Reciprocating engine technology is generally well-suited to demand-response applications such as the proposed project, so can be considered technologically feasible for this application; boilers, on the other hand, have very high thermal inertia, so are not quick-starting or fast ramping. Boiler technology is generally used for baseload power and not for highly variable demand-response power applications. Because boiler technology cannot meet the objectives of the project, it is not considered a technologically feasible alternative. Combined-cycle gas turbines are available with fast startup capability that makes them more compatible with the dispatch and ramping requirements of peaking projects that are intended to back up renewables; in fact, a fast-start combined cycle unit is proposed as part of ESPFM. Therefore, combined-cycle gas turbine technology is potentially technologically feasible for the proposed project.

Alternative Fuels

Biomass fuel can only be used with boiler technology and must be gasified for use in turbines. As discussed previously, boiler technology is not considered a technologically feasible alternative. Therefore, there are no alternative fuels that are considered technologically feasible without redefining the project.

Energy Efficiency

There are two potential applications of energy efficiency as potential BACT for the proposed project: (1) demand-side management and similar electric load reduction programs to minimize or eliminate the need for the proposed project altogether; and (2) use of the most efficient generating technology that meets the objectives of the project.

Implementation of energy efficiency programs is beyond the scope of this project. The purpose of this project is to help meet the energy demands that will remain after utility energy efficiency programs are implemented.

Utilization of the most efficient generating technology that meets the objectives of the project is technologically feasible.

Carbon Capture and Storage

Carbon capture and storage (CCS) technology may be considered to be "available" in the sense that commercial facilities have been built on a scale comparable to ESPFM (e.g., a natural gas processing operation[13] in Wyoming captures 3.6 million tonnes per year of CO_2, compared to the 0.6 million tonnes per year that would be emitted from ESPFM). However, the technology cannot yet be considered "applicable." The Interagency Task Force on Carbon Capture and Storage (ITF) found the following:

> *it is unclear how transferable the experience with natural gas processing is to separation of power plant flue gases, given the significant differences in the chemical make-up of the two gas steams. In addition, integration of these technologies with the power cycle at generating plants present significant cost and operating issues that will need to be addressed.*[14]

CCS has not yet reached the licensing and commercial sales stage of development. It is an emerging technology that has had limited successful application on an industrial scale, and no successful applications on a comparably sized natural gas power plant. There are no CCS systems commercially available for natural gas power plants in the United States. The Department of Energy expects commercial deployment in 2025.[15] CCS does not appear to be commercially available for this application.

<u>Step 3 – Rank Remaining Control Technologies</u>

Absent post-combustion removal or sequestration, CO_2 and other GHG emissions are a direct function of the amount of natural gas fuel burned. GHG emissions will be

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[13] Interagency Task Force on Carbon Capture and Storage, *Report of the Interagency Task Force on Carbon Capture and Storage,* August 2010. p. 28.
[14] Ibid.
[15] 73 FR 44370

minimized by minimizing heat rate and maximizing generating efficiency. The remaining technologies are ranked by their overall heat rate for consideration as BACT for this project, as shown in Table 4.

CO_2 is not the byproduct of incomplete combustion or contaminants in the fuel supply. It is an essential product of the combustion of natural gas. Therefore, the only way to reduce the amount of CO_2 generated is to minimize the amount of fuel combustion required to produce the desired amount of electricity. This is achieved by operating the unit efficiently and conducting regular maintenance to ensure continued good combustion. Good combustion practices are a well-established and widely used technique to minimize emissions from combustion sources. Good combustion operation and maintenance will maintain the thermal efficiency of the selected generating technology and therefore must also be considered a component of BACT to minimize GHG emissions.

Table 4
Ranking of Potential Generating Technologies/Controls by Heat Rate

Technology	Heat Rate Range (HHV basis)	Technologically Feasible for This Project?
Renewable energy sources	n/a	No
Biomass and other biofuels	n/a	No
Demand-side management	n/a	No
CCS	n/a	Maybe
Combined-cycle gas turbines	~7000 to 8000 Btu/kWh[a,b,c]	Yes
Reciprocating IC engines	~7500 Btu/kWh[d]	Yes
Simple-cycle gas turbines	~9400 to 10,000 Btu/kWh[a,b,c]	Yes
Boilers	>10,000 Btu/kWh[a,b,c]	No

Notes:
a. CEC FSA, Avenal Project. *http://www.energy.ca.gov/sitingcases/avenal/index.html*
b. CEC FSA, TIC Almond 2 Power Plant Project. *http://www.energy.ca.gov/sitingcases/almond/index.html*
c. CEC FSA, Carlsbad Energy Center Project. *http://www.energy.ca.gov/sitingcases/carlsbad/index.html*
d. Wärtsilä, specifications for 16V34SG and 20V34SG gas engines. *www.wartsila.com*

Step 4 – Evaluate the Most Effective Control Technology Considering Environmental, Energy, and Cost Impacts

Combined-cycle gas turbines

Combined-cycle gas turbines are inherently more efficient than simple-cycle gas turbines because they extract and use exhaust heat that would otherwise be wasted. A combined-cycle gas turbine is already proposed as part of this project, which will efficiently supply electricity. The proposed simple-cycle turbines supplement the combined-cycle unit by providing load-following capability and black start capability that cannot be provided by the combined cycle unit alone.

Reciprocating IC engines

Reciprocating IC engines are fast-starting, but the largest natural gas-fired IC engine currently available is the approximately 9 MW Wärtsilä 20V34SG.[16] The nominal 115 MW size of the proposed simple-cycle component of the project would require 13 of these engines, which would result in a far more complex and expensive plant and control system. Furthermore, BACT for NOx from engines of this type was recently determined to be 5 ppm, so NOx emissions from a comparable reciprocating engine plant would be approximately twice the NOx emissions from the proposed simple-cycle gas turbine project. Therefore, reciprocating IC engine technology is not considered BACT for this project.

Carbon Capture and Storage

CCS technology applicable to natural gas-fired projects refers to post-combustion capture. EPA's Interagency Task Force on Carbon Capture and Storage[17] found the following:

> *Post-combustion CO_2 capture … is challenging for the following reasons:*
>
> - *A high volume of gas must be treated because the CO_2 is dilute (13 to 15 percent by volume in coal-fired systems, three to four percent in natural-gas-fired systems);*
> - *The flue gas is at low pressure (near atmosphere);*
> - *trace impurities (particulate matter [PM], sulfur oxides [SOx], nitrogen oxides [NOx], etc.) can degrade the CO_2 capture materials; and*
> - *Compressing captured CO_2 from near atmospheric pressure to pipeline pressure (about 2,000 pounds per square inch absolute) requires a large auxiliary power load…Installing current amine post-combustion CO_2 capture technology on new conventional subcritical, supercritical, and ultra-supercritical coal-fired power plants would increase the COE by about 80 percent. Further, the large quantity of energy required to regenerate the amine solvent and compress the CO_2 to pipeline conditions would result in about a 30 percent energy penalty.*

The International Energy Agency estimates that "CCS can reduce CO_2 emissions from power plants…by more than 85%, and power plant efficiency by about 8-12 percentage points."[18] Although this energy penalty is for coal-fired plants and is not directly applicable to natural gas firing, it is expected to be reasonably representative of the

[16] *http://powerservices.lakho.com/2009/05/19/largest-natural-gas-reciprocating-engine-plant/*
[17] EPA, "Report of the Interagency Task Force on Carbon Capture and Storage," 2010, pp. 29-30 *http://www.epa.gov/climatechange/downloads/CCS-Task-Force-Report-2010.pdf*
[18] IEA Energy Technology Essentials, December 2006. *http://www.iea.org/techno/essentials.htm*

energy penalty for a natural gas-fired system because the lower content of CO_2 in gas turbine exhaust would not necessarily result in an efficiency savings (separation is still required, and there are no data to suggest that the differences in CO_2 concentrations between coal exhaust and gas turbine exhaust would result in lower separation costs). Assuming a minimum 8% energy penalty for CCS, the project would have to generate 8% more electricity to provide energy for CCS without reducing the electricity supply provided by the facility. Criteria pollutant and GHG emissions would also be 8% higher. Considering the energy and emissions penalties, the cost, and the lack of commercial availability, CCS is not considered BACT for the proposed project.

Step 5 – Determine BACT/Present Conclusions

As shown in Table 4, simple-cycle gas turbines typically have heat rates that range between 9,000 and 10,000 Btu/kWh. ESPFM proposes to use a newer, more energy efficient simple-cycle turbine technology, the Trent 60, which incorporates intercooling to promote enhanced energy efficiency. The heat rate of the Trent 60 is approximately 9,000 Btu/kWh (HHV), at the low end of the range of heat rates shown above for typical simple-cycle gas turbines. The use of this highly efficient simple-cycle gas turbine technology, combined with good combustion operation and maintenance to maintain optimum efficiency, is determined to be BACT for GHG.

Recent BACT determinations for criteria pollutants from similar gas turbine projects are summarized in Tables 5 through 7.

Table 5
Simple-Cycle Gas Turbine BACT Determinations (EPA RBLC Clearinghouse)

Facility/Location	Date Permit Issued	Equipment/Rating	NOx Limit/Control Technology	CO Limit/Control Technology	VOC Limit/Control Technology
Shady Hills Generating Station Pasco Co., FL	January 2010	GE Frame 7FA 2 turbines, 340 MW total	9.0 ppm Dry low-NOx burners and water injection	6.5 ppm (3 hour)	No BACT determination
Rawhide Energy Station Larimer Co., CA	June 2009	GE Frame 7FA 1 turbine, 150 MW total	9.0 ppm Dry low-NOx burners	No BACT determination	No BACT determination
TEC/Polk Power Energy Station Polk Co., FL	October 2007	Unspecified 2 turbines, 330 MW total	9.0 ppm Dry low-NOx burners	No BACT determination	No BACT determination

Table 6
Summary of BACT Determinations (CARB BACT Clearinghouse)

Facility/District	Permit No./Date	Equipment/Rating	NOx Limit/ Control Technology	CO Limit/Control Technology	VOC Limit/Control Technology
CalPeak Power El Cajon San Diego Co., CA	June 2001	Pratt & Whitney FT-8 DLN Twin Pac 2 turbines 49.5 MW total	3.5 ppm SCR	50 ppm Oxidation catalyst	2.0 ppm Oxidation catalyst
Indigo Energy Facility Los Angeles Co., CA	July 2001	LM6000 (Enhanced Sprint) 1 turbine, 45 MW total	5.0 ppm SCR	6.0 ppm Oxidation catalyst	2.0 ppm Oxidation catalyst
El Colton, LLC San Bernardino Co., CA	January 2003	LM6000 (Enhanced Sprint) 1 turbine, 48.7 MW total	3.5 ppm SCR	6.0 ppm Oxidation catalyst	2.0 ppm Oxidation catalyst
Lambie Energy Center Solano Co., CA	December 2002	GE LM6000 Sprint PC 1 turbine, 49.9 MW total	2.5 ppm SCR	6.0 ppm Oxidation catalyst	2.0 ppm Oxidation catalyst
Los Angeles Dept. of Water and Power Los Angeles Co., CA	May 2001	GE LM6000 1 turbine, 47.4 MW total	5.0 ppm SCR	6.0 ppm Oxidation catalyst	2.0 ppm Oxidation catalyst

Table 7
Summary of BACT Determinations (CEC Decisions)

Facility/District	Decision Date	Equipment/Rating	NOx Limit/ Control Technology	CO Limit/Control Technology	VOC Limit/Control Technology
TID Almond 2 Power Plant Ceres, CA	December 2010	GE LM6000 Sprint PG 3 turbines, 174 MW	2.5 ppm Ultra-low NOx burners, water injection and SCR	4.0 ppm (3 hour) Oxidation catalyst	2.0 ppm Oxidation catalyst
Canyon Power Plant Orange Co., CA	March 2010	GE LM6000 Sprint PC 4 turbines, 200 MW total	2.5 ppm Ultra-low NOx burners, water injection and SCR	4.0 ppm (3 hour) Oxidation catalyst	2.0 ppm Oxidation catalyst
Starwood Power-Midway Fresno Co., CA	January 2008	Pratt & Whitney FT8-3 SwiftPac 2 turbines, 120 MW total	2.5 ppm Water injection and SCR	6.0 ppm (3 hour) Oxidation catalyst	2.0 ppm Oxidation catalyst
Panoche Energy Project Fresno Co., CA	December 2007	GE LMS100 4 turbines, 400 MW total	2.5 ppm Water injection and SCR	6.0 ppm (3 hour) Oxidation catalyst	2.0 ppm Oxidation catalyst
San Francisco Electric Reliability Project Power Plant San Francisco Co., CA	October 2006	GE LM6000 Sprint PC 3 turbines, 145 MW total	2.5 ppm Water injection and SCR	4.0 ppm (3 hour) Oxidation catalyst	2.0 ppm Oxidation catalyst
Inland Empire Energy Center Imperial County, CA	October 2006	GE LM6000 Sprint PC 2 turbines, 93 MW total	2.5 ppm Dry low-NOx burners and SCR	6.0 ppm (3 hour) Oxidation catalyst	2.0 ppm Oxidation catalyst

BACT for the Simple-Cycle CTGs: Startup/Shutdown

Startup and shutdown periods are a normal part of the operation of simple-cycle power plants such as ESPFM. BACT must also be applied during the startup and shutdown periods of gas turbine operation. The BACT limits discussed in the previous section apply to steady-state operation, when the turbines have reached stable operations and the emission control systems are fully operational.

NOx EMISSIONS

Step 1 – Identify All Possible Control Technologies

The following technologies for control of NOx during startups and shutdowns have been identified:

- A Selective Catalytic Reduction (SCR) system capable of continuously complying with a limit of 2.5 ppmvd @15% O_2 (1-hour average);
- Fast-start technologies;
- Operating practices to minimize the duration of startup and shutdown.

The Trent turbine proposed for this project is controlled by SCR, which will operate at all times that the stack temperature is in the proper operating range.

Step 2 – Eliminate Technologically Infeasible Options

During gas turbine startup, there are equipment and process requirements that must be met in sequential order to protect the equipment.

For all turbine technologies, incomplete combustion at low loads results in higher CO and VOC emission rates. Furthermore, the post-combustion controls that are used to achieve additional emissions reductions (SCR and oxidation catalyst) require that specific exhaust temperature ranges be reached to be fully effective. The use of SCR to control NOx is not technically feasible when the surface of the SCR catalyst is below the manufacturer's recommended operating range. When catalyst surface temperatures are low, ammonia will not react completely with the NOx, resulting in excess NOx emissions or excess ammonia slip or both. The oxidation catalyst is not effective at controlling CO emissions when exhaust temperature is below the optimal temperature range. Therefore, exhaust gas controls used to achieve BACT for normal operations are not feasible control techniques during startups and shutdowns.

This "top-down" BACT analysis will consider the following NOx emission limitations:

- Operating practices to minimize emissions during startup and shutdown; and
- Design features to minimize the duration of startup and shutdown.

Step 3 – Rank Remaining Control Technologies by Control Effectiveness

Operating Practices to Minimize Emissions during Startup and Shutdown

There are basic principles of operation, or Best Management Practices, that minimize emissions during startups and shutdowns. These Best Management Practices are outlined below.

- During a startup, bring the gas turbine to the minimum load necessary to achieve compliance with the applicable NOx and CO emission limits as quickly as possible, consistent with the equipment manufacturers' recommendations and safe operating practices.

- During a startup, initiate ammonia injection to the SCR system as soon as the SCR catalyst temperature and ammonia vaporization system have reached their minimum operating temperatures.

- During a shutdown, once the turbine reaches a load that is below the minimum load necessary to maintain compliance with the applicable NOx and CO emission limits, reduce the gas turbine load to zero as quickly as possible, consistent with the equipment manufacturers' recommendations and safe operating practices.

- During a shutdown, maintain ammonia injection to the SCR system as long as the SCR catalyst temperature and ammonia vaporization system remain above their minimum operating temperatures.

A key underlying consideration of these Best Management Practices is the overall safety of the plant staff by promoting operation within the limitations of the equipment and systems, and allowing for operator judgment and response times to respond to alarms and trips during the startup sequence.

Design Features to Minimize the Duration of Startup and Shutdown

An additional technique to reduce startup emissions is to minimize the amount of time the gas turbine spends in startup. The use of simple-cycle gas turbine technology inherently minimizes this time, in that simple-cycle gas turbines generally start up and shut down much more quickly than combined-cycle turbines.

Step 4 – Evaluate the Most Effective Control Technology Considering Environmental, Energy, and Cost Impacts

Utilizing best operating practices to minimize emissions during startups and shutdowns has no adverse environmental or energy impacts, nor does it require additional capital expenditure.

The approach of reducing startup/shutdown duration has no adverse environmental or energy impacts, and the use of simple-cycle generating technology minimizes startup/shutdown duration.

Step 5 - Determine BACT/Present Conclusions

BACT for NOx during startups/shutdowns is the use of operating systems/practices that reduce the duration of startups and shutdowns to the greatest extent feasible, and the use of operational techniques to initiate ammonia injection as soon as possible during a startup. Therefore, BACT is determined to be the use of simple-cycle gas turbine technology and the application of operating systems/practices that minimize startup and shutdown durations, in combination with the use of operational techniques to initiate ammonia injection as soon as possible during a startup.

CO EMISSIONS

Step 1 – Identify All Possible Control Technologies

The CO control technologies under consideration for startups and shutdowns are ranked as follows:

- Oxidation catalyst unit capable of achieving 4 ppmvd @ 15% O_2
- Operating practices to minimize the duration of startup and shutdown

Step 2 – Eliminate Technologically Infeasible Options

None of the proposed alternatives is infeasible for this application.

Step 3 – Rank Remaining Control Technologies by Control Effectiveness

Ranking for the control technologies is as indicated in Step 1.

Step 4 – Evaluate the Most Effective Control Technology Considering Environmental, Energy, and Cost Impacts

Similar to the discussion above for NOx, CO emissions during startup and shutdown are minimized by minimizing the length of time that the turbine fires while the oxidation catalyst is not in its operating temperature range.

Step 5 – Determine BACT/Present Conclusions

BACT for CO during startups/shutdowns is the use of simple-cycle gas turbine technology and operating practices that reduce the duration of startups and shutdowns to the greatest extent feasible.

VOC EMISSIONS

Step 1 – Identify All Possible Control Technologies

The VOC control technologies under consideration for startups and shutdowns are ranked as follows:

- Operating practices to minimize the duration of startup and shutdown

Step 2 – Eliminate Technologically Infeasible Options

None of the proposed alternatives is infeasible for this application.

Step 3 – Rank Remaining Control Technologies by Control Effectiveness

Ranking for the control technologies is as indicated in Step 1.

Step 4 – Evaluate the Most Effective Control Technology Considering Environmental, Energy, and Cost Impacts

VOC emissions during startup and shutdown are minimized by minimizing the length of time during startup and shutdown.

Step 5 – Determine BACT/Present Conclusions

BACT for VOC during startups/shutdowns is the use of simple-cycle gas turbine technology and operating practices that reduce the duration of startups and shutdowns to the greatest extent feasible.

SULFUR OXIDE EMISSIONS

Step 1 – Identify All Possible Control Technologies

The SOx control technologies under consideration for startups and shutdowns are ranked as follows:

- Use of natural gas as a fuel
- Operating practices to minimize the duration of startup and shutdown

Step 2 – Eliminate Technologically Infeasible Options

None of the proposed alternatives is infeasible for this application.

Step 3 – Rank Remaining Control Technologies by Control Effectiveness

Ranking for the control technologies is as indicated in Step 1.

Step 4 – Evaluate the Most Effective Control Technology Considering Environmental, Energy, and Cost Impacts

SOx emissions during startup and shutdown are minimized by minimizing the length of time during startup and shutdown.

Step 5 – Determine BACT/Present Conclusions

BACT for SOx during startups/shutdowns is the use of simple-cycle gas turbine technology and operating practices that reduce the duration of startups and shutdowns to the greatest extent feasible.

PM/PM_{10}/$PM_{2.5}$ EMISSIONS

Step 1 – Identify All Possible Control Technologies

The analysis for particulate is identical to the analysis for SOx.

Step 2 – Eliminate Technologically Infeasible Options

The analysis for particulate is identical to the analysis for SOx.

Step 3 – Rank Remaining Control Technologies by Control Effectiveness

The analysis for particulate is identical to the analysis for SOx.

Step 4 – Evaluate the Most Effective Control Technology Considering Environmental, Energy, and Cost Impacts

The analysis for particulate is identical to the analysis for SOx.

Step 5 – Determine BACT/Present Conclusions

BACT for particulate during startups/shutdowns is the use of simple-cycle gas turbine technology and operating practices that reduce the duration of startups and shutdowns to the greatest extent feasible.

GHG EMISSIONS

Step 1 – Identify All Possible Control Technologies

The GHG control technologies under consideration for startups and shutdowns are ranked as follows:

- Operating practices to minimize the duration of startup and shutdown

Step 2 – Eliminate Technologically Infeasible Options

None of the proposed alternatives is infeasible for this application.

Step 3 – Rank Remaining Control Technologies by Control Effectiveness

Ranking for the control technologies is as indicated in Step 1.

Step 4 – Evaluate the Most Effective Control Technology Considering Environmental, Energy, and Cost Impacts

GHG emissions during startup and shutdown are minimized by minimizing the length of time during startup and shutdown.

Step 5 – Determine BACT/Present Conclusions

BACT for GHG during startups/shutdowns is the use of simple-cycle gas turbine technology and operating practices that reduce the duration of startups and shutdowns to the greatest extent feasible.

SUMMARY

Proposed BACT determinations for the ESPFM simple-cycle gas turbines are summarized in Table 8.

Table 8
Proposed BACT Determinations for ESPFM Simple-Cycle Gas Turbines

Pollutant	Proposed BACT Determination
Nitrogen Oxides	Dry low-NOx combustors and SCR system, 2.5 ppmc[a], 1-hour average, with excursions under specific conditions; no CCS
Sulfur Dioxide	Natural gas fuel (sulfur content not to exceed 0.75 grain/100 scf short-term average, 0.25 grains/100 scf long-term average)
Carbon Monoxide	Good combustion practices and oxidation catalyst, 4.0 ppmc, 1-hour average
VOC	Good combustion practices, 2.0 ppmc, 1-hour average
PM_{10}	Natural gas fuel, 5 PM_{10} lbs/hr
$PM_{2.5}$	Natural gas fuel, 5 $PM_{2.5}$ lbs/hr
GHGs	Trent 60 simple-cycle gas turbine technology, good combustion practices
Ammonia	5 ppm ammonia slip
Startup/Shutdown	Best operating practices to minimize startup/shutdown times and emissions

Note:
a. ppmc: parts per million by volume, corrected to 15% O_2

BACT for the Combined-Cycle CTG: Normal Operations

NOx EMISSIONS

Step 1 – Identify All Possible Control Technologies

The emissions unit for which BACT is being considered is a nominal 210 MW gas turbine operating in combined cycle. Potential control technologies were identified by searching the following sources for determinations pertaining to combustion gas turbines:

- SCAQMD BACT Guidelines;
- SJVAPCD BACT Clearinghouse;
- BAAQMD BACT Guidelines;
- EPA RACT/BACT/ Lowest Achievable Emission Rate Clearinghouse;
- Other district and state BACT Guidelines; and
- BACT/LAER requirements in New Source Review permits issued by a local air district[19] or other air pollution control agency.

Technologies identified for control of NOx are listed below.

- Selective Catalytic Reduction (SCR) system capable of continuously complying with a limit of 2.0 ppmvd @15% oxygen (O_2) (1-hour average)
- EMx (formerly SCONOx) system capable of continuously complying with a limit of 2.0 ppmvd @15% O_2 (1-hour average)
- Alternative Basic Equipment: renewable energy source (e.g., solar, wind, etc.)

Alternative basic equipment—including renewable energy sources, such as solar and wind—was already discussed above (Step 1 for NOx BACT for the simple-cycle CTGs). For the same reasons, solar, wind and other renewable energy sources are rejected as NOx BACT for this application.

Step 2 – Eliminate Technologically Infeasible Options

Exhaust Stream Controls

The most recent NOx BACT listings for industrial combined-cycle combustion turbines in this size range are summarized in Table 9. The most stringent NOx limit in these recent BACT determinations is a 2.0 ppm[20] limit averaged over a 1-hour averaging period, excluding startups and shutdowns. This level is achieved using dry low-NOx combustors and SCR.

[19] Any Air Quality Management District or Air Pollution Control District in California.
[20] All turbine/HRSG exhaust emissions concentrations shown are by volume, dry corrected to 15% O_2.

Table 9
Recent NOx BACT Determinations for Combined-Cycle Combustion Turbines

Facility	District	NOx Limit[a]	Averaging Period	Control Method Used	Date Permit Issued	Source
Inland Empire Energy Center	SCAQMD	2.0	1-hour	SCR	2003	CEC AFC
El Segundo	SCAQMD	2.0	1-hour	SCR	2010	CEC AFC
GWF Tracy	SJVAPCD	2.0	1-hour	SCR	2010	CEC AFC
Oakley Generating Station	BAAQMD	2.0	1-hour	SCR	2011	CEC AFC
Watson Cogeneration	SCAQMD	2.0	1-hour	SCR	2012	CEC AFC

Note:
a. All concentrations expressed as parts per million by volume dry, corrected to 15% O_2.

Either SCR or EMx technology is capable of achieving a NOx emission level of 2.0 ppmvd @ 15% O_2. Neither has been demonstrated to consistently achieve lower emission levels in combined-cycle turbines. See the discussion of these two technologies in the BACT section for simple-cycle turbines.

<u>Step 3 – Rank Remaining Control Technologies by Control Effectiveness</u>

SCR (and arguably, EMx) is capable of achieving a NOx emission level of 2.0 ppmvd @ 15% O_2. Both technologies are therefore ranked together.

<u>Step 4 – Evaluate the Most Effective Control Technology Considering Environmental, Energy, and Cost Impacts</u>

The comparison between SCR and EMx is the same for application to combined cycle as for simple cycle. Both are deemed capable of achieving 2.0 ppmvd NOx emission levels.

<u>Step 5 – Determine BACT/Present Conclusions</u>

BACT must be at least as stringent as the most stringent level achieved in practice, federal NSPS, or district prohibitory rule. Based upon the results of this analysis, the NOx BACT determination of 2.0 ppmvd @ 15% O_2 on a 1-hour average basis made for recently permitted combined-cycle turbine projects in SCAQMD and elsewhere reflects the most stringent NOx emission limit that has been achieved in practice. No more stringent level has been suggested as being technologically feasible. Therefore, BACT for NOx for this application is any technology capable of achieving 2.0 ppmvd @ 15% O_2 on a 1-hour average basis.

The Project facility will be designed to meet a NOx level of 2.0 ppmvd @ 15% O_2 on a 1-hour average basis using SCR.

CO EMISSIONS

Step 1 – Identify All Possible Control Technologies

CO emitted from natural gas-fired turbines is the result of incomplete combustion of fuel. Use of an oxidation catalyst is generally considered BACT for CO.

Alternative basic equipment—including renewable energy sources, such as solar and wind—was already discussed above (Step 1 for NOx BACT on the CTGs). For the same reasons, solar, wind and other renewable energy sources are rejected as CO BACT for this application.

Step 2 – Eliminate Technologically Infeasible Options

The only technology under consideration is use of an oxidation catalyst in combination with combustion controls. This combination of technologies has been demonstrated to be feasible in many applications. No other technologies have been identified that are capable of achieving the same level of control. As a result, the goal of the remaining analysis is to determine the appropriate emission limit that constitutes BACT for this application.

CARB's BACT guidance document for electric generating units rated at greater than 50 MW indicates that BACT for the control of CO emissions from stationary gas turbines used for combined-cycle and cogeneration power plants is 6 ppmvd @ 15% O_2 (see Table 3).

The BAAQMD's BACT guidelines specify that, for natural gas-fired combined-cycle gas turbines larger than 40 MW, a CO limit of 4 ppmv @ 15% O_2 has been "achieved in practice."

The SJVAPCD's BACT guidelines contained determinations for gas turbines larger than 50 MW with uniform load and with heat recovery. The SJVAPCD concluded that a CO exhaust concentration of 6 ppmv @ 15% O_2 constituted BACT that had been achieved in practice, while 4.0 ppmv @ 15% O_2 is considered technologically feasible.

A summary of recent CO BACT determinations for large, combined-cycle gas turbines is shown in Table 10. Similar facilities using oxidation catalysts have been permitted at between 2.0 and 4.0 ppm CO.

Published prohibitory rules from the BAAQMD, SMAQMD, SDCAPCD, SJVAPCD, and SCAQMD were reviewed to identify the CO standards that govern existing natural gas-fired simple-cycle combustion gas turbines. Of the five prohibitory rules reviewed, the SJVAPCD prohibitory rule for combustion gas turbines is the only one that includes an emission limit for CO (200 ppmv @ 15% O_2). The applicable NSPS (40 CFR 60 Subpart KKKK) does not include a CO limit.

Table 10
Recent CO BACT Determinations for Combined-Cycle Combustion Turbines

Facility	District	CO Limit[a]	Averaging Period	Control Method Used	Date Permit Issued	Source
Inland Empire	SCAQMD	4.0	1-hour	Oxidation Catalyst	2003	CEC AFC
El Segundo	SCAQMD	2.0	1-hour	Oxidation Catalyst	2010	CEC AFC
Oakley Generating Station	BAAQMD	2.0	1-hour	Oxidation catalyst	2011	CEC AFC
GWF Tracy	SJVAPCD	2.0	1-hour	Oxidation catalyst	2010	CEC AFC
Watson Cogeneration	SCAQMD	2.0	1-hour	Oxidation catalyst	2012	CEC AFC

Note:
a. All concentrations expressed as parts per million by volume dry, corrected to 15% O_2.

<u>Step 3 – Rank Remaining Control Technologies by Control Effectiveness</u>

The control technologies under consideration are ranked as follows:

- Oxidation catalyst unit capable of achieving 2 ppmvd @ 15% O_2

<u>Step 4 – Evaluate the Most Effective Control Technology Considering Environmental, Energy, and Cost Impacts</u>

This step evaluates any source-specific environmental, energy, or economic impacts that demonstrate that the top alternative listed in the previous step is inappropriate as BACT.

The applicant has proposed to meet 2 ppmc limit on a 1-hour average basis. Because the applicant has proposed to use the highest-ranked technology under consideration, the analysis ends at this step.

<u>Step 5 – Determine BACT/Present Conclusions</u>

BACT must be at least as stringent as the most stringent level achieved in practice, required in a federal NSPS or district prohibitory rule, or considered technologically feasible. The proposed CO emission limit of 2 ppmvd @ 15% O_2 on a 1-hour average basis is BACT for this source.

VOC EMISSIONS

Step 1 – Identify All Possible Control Technologies

Most VOCs emitted from natural gas-fired turbines are the result of incomplete combustion of fuel. Therefore, most of the VOCs are methane and ethane, which are not effectively controlled by an oxidation catalyst. However, oxidation catalyst technology designed to control CO can also provide some degree of control of VOC emissions, especially the more complex and toxic compounds formed in the combustion process.

Alternative basic equipment—including renewable energy sources, such as solar and wind—has also been identified as a technology for the control of VOC emissions.

Step 2 – Eliminate Technologically Infeasible Options

The only technology under consideration is use of an oxidation catalyst in combination with combustion controls. This combination of technologies has been demonstrated to be feasible in many applications. No other technologies have been identified that are capable of achieving the same level of control. As a result, the goal of the remainder of this analysis is to determine the appropriate emission limit that constitutes BACT for this application.

CARB's BACT guidance document for electric generating units rated at greater than 50 MW[21] indicates that BACT for the control of VOC emissions for combined-cycle and cogeneration power plants is 2 ppmvd @ 15% O_2 (see Table 3).

The SJVAPCD's BACT guidelines contain a determination for gas turbines rated at larger than 50 MW with uniform load and without heat recovery. The SJVAPCD concluded that a VOC exhaust concentration of 2.0 ppmvd @ 15% O_2 constituted BACT that had been achieved in practice, while 0.6 to 1.3 ppmvd @ 15% O_2 is considered technologically feasible.

Published prohibitory rules from the BAAQMD, SMAQMD, SDCAPCD, SJVAPCD, and SCAQMD were reviewed to identify the VOC standards that govern existing natural gas-fired combined-cycle combustion gas turbines. None of the prohibitory rules for combustion gas turbines specify an emission limit for VOC. The applicable NSPS (40 CFR 60 Subpart KKKK) does not include a VOC limit.

This "top-down" VOC BACT analysis will consider the following VOC emission limitations:

- 0.6 ppmvd @ 15% O_2 (3-hour average);
- 1.3 ppmvd @ 15% O_2 (3-hour average); and
- 2 ppmvd @ 15% O_2 (1-hour average).

[21] CARB, "Guidance for Power Plant Siting and Best Available Control Technology," September 1999.

Alternative basic equipment—including renewable energy sources, such as solar and wind—was already discussed above (Step 2 for NOx BACT on the CTG). For the same reasons, solar, wind and other renewable energy sources are rejected as VOC BACT for this application.

Step 3 – Rank Remaining Control Technologies by Control Effectiveness

The control technologies under consideration are ranked as follows:

- Oxidation catalyst unit capable of achieving 0.6 ppmvd @ 15% O_2
- Oxidation catalyst unit capable of achieving 1.3 ppmvd @ 15% O_2
- Oxidation catalyst unit capable of achieving 2 ppmvd @ 15% O_2

Step 4 – Evaluate the Most Effective Control Technology Considering Environmental, Energy, and Cost Impacts

This step evaluates any source-specific environmental, energy, or economic impacts that demonstrate that the top alternative listed in the previous step is inappropriate as BACT.

"Achieved in Practice" Criterion

As discussed above, the SJVAPCD BACT guideline for large gas turbines without heat recovery suggests that VOC emission rates of between 0.6 and 1.3 ppm may be technologically feasible, based on two recently permitted projects. The Sunrise Power Company project used a 165 MW GE Frame 7FA gas turbine with dry low NOx (DLN) combustors for NOx control. The Tracy Peaker project used an 84 MW GE Frame 7EA gas turbine, also with a DLN combustor. Both the 7EA and the 7FA are industrial turbines.

Numerous projects have been permitted and have demonstrated continuous compliance with a 2 ppmc VOC limit, so 2 ppmc is considered achieved in practice for this generating technology.

Technologically Feasible/Cost Effective Criterion

As discussed above, a VOC limit of 2 ppmc has been achieved in practice for the CTG being considered for the Project. Lower VOC limits that may be technologically feasible for this class and category of source have not been identified. The 0.6 and 1.3 ppm limits identified in the SJVAPCD guideline were associated with turbines intended to operate under uniform load (i.e., baseload turbines). While much of the load-following requirements for ESP will be met by the simple-cycle Trent turbines, the combined-cycle turbine is also expected to be required to perform under variable load, and on occasion may go through two full startup/shutdown cycles on a single day. Because of this variable load, in order to ensure compliance at all times with a 1-hour limit, the applicant has proposed to meet a 2 ppmc limit on a 1-hour average basis.

Step 5 – Determine BACT/Present Conclusions

BACT must be at least as stringent as the most stringent achieved in practice, required in a federal NSPS or district prohibitory rule, or considered technologically feasible. Based upon the results of this analysis, the VOC emission limits of 2.0 ppmvd @ 15% O_2 are considered to be BACT for the proposed project.

SULFUR OXIDE EMISSIONS

Step 1 – Identify All Possible Control Technologies

Natural gas fired combustion turbines have inherently low SOx emissions due to the small amount of sulfur present in the fuel. With typical pipeline quality natural gas sulfur contents well below 1 grain/100 scf, the SOx emissions for natural gas fired combustion turbines are orders of magnitude less than oil-fired turbines. Firing by natural gas and the resulting control of SOx emissions have been used by numerous combustion turbines throughout the world. Due to the prevalence of the use of natural gas to control SOx emissions from combustion turbines, only an abbreviated discussion of post-combustion controls will be addressed in this section.

Post-combustion SOx control systems include dry and wet scrubber systems. These types of systems are typically installed on high SOx emitting sources such as coal-fired power plants. Post-combustion control systems for combustion turbines also include ESx catalyst systems. These systems trap the sulfur in the exhaust stream on an ESx catalyst. During a regeneration process, the sulfur is removed from the ESx catalyst and is either reintroduced back into the exhaust stream or sent to a sulfur scrubbing system. If the sulfur removed from the ESx catalyst is reintroduced back into the exhaust stream, there is no SOx control associated with the system.

Step 2 – Eliminate Technically Infeasible Options

All of the control options discussed above are technically feasible.

Step 3 – Rank Remaining Control Technologies by Control Effectiveness

The typical SOx control level for a well-designed wet or dry scrubber installed on a coal fired boiler ranges from approximately 70% to 90%,[22] with some installations achieving even higher control levels. According to EmeraChem literature,[23] the ESx system is capable of removing approximately 95% of the SOx emissions from the exhaust stream of natural gas fired combustion turbines. With the sulfur scrubber option, during the regeneration cycle of the ESx system the sulfur captured on the ESx catalyst is sent to a

[22] Air Pollution Control Manual, Air and Waste Management Association, Second Edition, p. 206.
[23] "High Performance EMx Emissions Control Technology for Fine Particles, NOx, CO, and VOCs from Combustion Turbines and Stationary IC Engines," Steven DeCicco and Thomas Girdlestone, EmeraChem Power, June 2008, p. 19.

sulfur scrubbing unit. A high-efficiency sulfur scrubbing unit would achieve a control level similar to that of the wet/dry scrubbers discussed above.

Step 4 – Evaluate the Most Effective Control Technology Considering Environmental, Energy, and Cost Impacts

The use of low sulfur content pipeline natural gas has been achieved in practice at numerous combustion turbine installations throughout the world, and the use of this fuel minimizes SOx emissions. While it would be theoretically feasible to install some type of post-combustion control—such as a dry/wet scrubber system or an ESx catalyst with a sulfur scrubber—on a natural gas fired turbine, these systems are not cost effective due to the inherently low SOx emissions associated with the use of natural gas, and regulatory agencies do not require them. Consequently, no further discussion of post-combustion SOx control is necessary.

Step 5 – Determine BACT/Present Conclusions

The SOx control method for the proposed ESPFM is the use of pipeline-quality natural gas. Consequently, the proposed project is consistent with BACT requirements.

$PM/PM_{10}/PM_{2.5}$ EMISSIONS

Step 1 – Identify All Possible Control Technologies

Alternative basic equipment—including renewable energy sources, such as solar and wind—has also been identified as a technology for the control of $PM/PM_{10}/PM_{2.5}$ emissions. Such alternative basic equipment was already discussed above (Step 1 for NOx BACT on the CTG/HRSG). For the same reasons, solar, wind and other renewable energy sources are rejected as $PM_{10}/PM_{2.5}$ BACT for this application.

Achievable Controlled Levels and Available Control Options

PM emissions from natural gas-fired turbines primarily result from carryover of noncombustible trace constituents in the fuel. PM emissions are minimized by using clean-burning pipeline quality natural gas with low sulfur content.

CARB's BACT Clearinghouse, as well as the BAAQMD and SJVAPCD BACT guidelines, identifies the use of natural gas as the primary fuel as "achieved in practice" for the control of PM_{10} for combustion gas turbines.

CARB's BACT guidance document for stationary gas turbines used for power plant configurations[24] indicates that BACT for the control of PM emissions is an emission limit corresponding to natural gas with fuel sulfur content of no more than 1 grain/100 standard cubic foot.

[24] Ibid, Table I-2.

Title 40 CFR Part 60 Subpart KKKK contains the applicable NSPS for combustion gas turbines. Subpart KKKK does not regulate PM_{10} emissions.

Published prohibitory rules from the SCAQMD, SJVAPCD, SMAQMD, and SDCAPCD were reviewed to identify the PM_{10} standards that govern natural gas-fired combustion gas turbines. These prohibitory rules do not regulate PM_{10} emissions.

Step 2 – Eliminate Technologically Infeasible Options

As discussed above, solar, wind, and other renewable energy alternatives are not considered technologically feasible for this application.

Step 3 – Rank Remaining Control Technologies by Control Effectiveness

No control technology other than the use of clean natural gas fuel has been identified for this application.

Step 4 – Evaluate the Most Effective Control Technology Considering Environmental, Energy, and Cost Impacts

No control technology other than the use of clean natural gas fuel has been identified for this application.

Step 5 – Determine BACT/Present Conclusions

Based upon the results of this analysis, the use of natural gas as the primary fuel source constitutes BACT for PM_{10} emissions from combustion gas turbines. Through the use of natural gas, the turbine is expected to be able to meet the proposed emission limit of 9.5 lbs/hr.

GHG EMISSIONS

Step 1 – Identify All Possible Control Technologies

EPA has indicated in its guidance on BACT for GHGs[25] that the following types of controls must be considered in determining BACT for GHGs:

- Inherently lower-emitting processes/practices/designs;
- Add-on controls; and
- Combinations of inherently lower emitting processes/practices/designs and add-on controls.[26]

[25] EPA, "PSD and Title V Permitting Guidance for Greenhouse Gases," November 2010, p. 33
[26] Ibid., p.27.

EPA further acknowledges that the requirement to consider inherently lower-emitting processes/practices/designs does not require a fundamental redesign of the nature of the source. This indicates that lower-emitting process/practices/designs that do not achieve the goals, objectives, or purposes of the project may be considered technologically infeasible as BACT for a project.

The following control technologies were identified as potentially "available" for ESPFM:

- Alternative generating technologies;
- Alternative fuels;
- Energy efficiency; and
- Carbon capture and storage.

Alternative basic equipment—including renewable energy sources, such as solar and wind—was already discussed above (Step 1 for NOx BACT on the CTG). For the same reasons, solar, wind and other renewable energy sources are rejected as GHG BACT for this application.

<u>Step 2 – Eliminate Technologically Infeasible Options</u>

EPA considers a technology to be technically feasible if has been demonstrated in practice on a similar facility, or is available and applicable to the source type under review. EPA considers a technology to be "available" where it can be obtained through commercial channels or is otherwise available within the common meaning of the term (e.g., it has been demonstrated in practice on a comparable, but not necessarily similar, facility). A technology is applicable if it may reasonably be expected to be successfully applied to the source type under review.

Alternative Fossil Fuel Generating Technologies

Alternative fossil fuel generating technologies such as reciprocating internal combustion engines and boilers may be considered as potential technologically feasible alternatives to the proposed use of combined-cycle combustion turbine technology. Reciprocating engine technology is generally well-suited to demand-response applications such as the proposed project, so can be considered technologically feasible for this application. Boilers, on the other hand, have very high thermal inertia, so are not quick-starting or fast ramping. Boiler technology is generally used for baseload power, not for highly variable demand-response power applications. Because boiler technology cannot meet the objectives of the project, it is not considered a technologically feasible alternative.

Alternative Fuels

Biomass fuel can be used only with boiler technology and must be gasified for use in turbines. As discussed previously, boiler technology is not considered a technologically feasible alternative. Therefore, there are no alternative fuels that are considered technologically feasible without redefining the project.

Energy Efficiency

There are two potential applications of energy efficiency as potential BACT for the proposed project: (1) demand-side management and similar electric load reduction programs to minimize or eliminate the need for the proposed project altogether; and (2) use of the most efficient generating technology that meets the objectives of the project.

Implementation of energy efficiency programs is beyond the scope of this project. The purpose of this project is to help meet the energy demands that will remain after utility energy efficiency programs are implemented.

Utilization of the most efficient generating technology that meets the objectives of the project is technologically feasible.

Carbon Capture and Storage

CCS technology may be considered to be "available," in the sense that commercial facilities have been built on a scale comparable to ESPFM (e.g., a natural gas processing operation[27] in Wyoming captures 3.6 million tonnes per year of CO_2, compared to the 0.6 million tonnes per year that would be emitted from ESPFM); however, the technology cannot yet be considered "applicable." The Interagency Task Force on Carbon Capture and Storage (ITF) found the following:

> *it is unclear how transferable the experience with natural gas processing is to separation of power plant flue gases, given the significant differences in the chemical make-up of the two gas steams. In addition, integration of these technologies with the power cycle at generating plants present significant cost and operating issues that will need to be addressed.*[28]

CCS has not yet reached the licensing and commercial sales stage of development. It is an emerging technology that has had limited successful applications on an industrial scale, and no successful applications on a comparably sized natural gas power plant. There are no CCS systems commercially available for natural gas power plants in the United States, and the Department of Energy does not expect commercial deployment until 2025.[29] CCS does not appear to be commercially available for this application.

<u>Step 3 – Rank Remaining Control Technologies</u>

Absent post-combustion removal or sequestration, CO_2 and other GHG emissions are a direct function of the amount of natural gas fuel burned. GHG emissions will be

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[27] Interagency Task Force on Carbon Capture and Storage, *Report of the Interagency Task Force on Carbon Capture and Storage,* August 2010. p. 28.
[28] Ibid.
[29] 73 FR 44370

minimized by minimizing heat rate and maximizing generating efficiency. The remaining technologies are ranked by their overall heat rate for consideration as BACT for this project, as shown in Table 11.

Table 11
Ranking of Potential Generating Technologies/Controls by Heat Rate

Technology	Heat Rate Range (HHV basis)	Technologically Feasible for This Project?
Renewable energy sources	n/a	No
Biomass and other biofuels	n/a	No
Demand-side management	n/a	No
CCS	n/a	Maybe
Combined-cycle gas turbines	~7000 to 8000 Btu/kWh[a,b,c]	Yes
Reciprocating IC engines	~7500 Btu/kWh[d]	Yes
Simple-cycle gas turbines	~9400 to 10,000 Btu/kWh[a,b,c]	Yes
Boilers	>10,000 Btu/kWh[a,b,c]	No

Notes:
a. CEC FSA, Avenal Project. *http://www.energy.ca.gov/sitingcases/avenal/index.html*
b. CEC FSA, TIC Almond 2 Power Plant Project. *http://www.energy.ca.gov/sitingcases/almond/index.html*
c. CEC FSA, Carlsbad Energy Center Project. *http://www.energy.ca.gov/sitingcases/carlsbad/index.html*
d. Wärtsilä, specifications for 1V34SG and 20V34SG gas engines. *www.wartsila.com*

CO_2 is not the byproduct of incomplete combustion or contaminants in the fuel supply—it is an essential product of the combustion of natural gas. Therefore, the only way to reduce the amount of CO_2 generated is to minimize the amount of fuel combustion required to produce the desired amount of electricity. This is achieved by operating the unit efficiently and conducting regular maintenance to ensure continued good combustion. Good combustion practices are a well-established and widely used technique to minimize emissions from combustion sources. Good combustion operation and maintenance will maintain the thermal efficiency of the selected generating technology and therefore must also be considered a component of BACT to minimize GHG emissions.

<u>Step 4 – Evaluate the Most Effective Control Technology Considering Environmental, Energy, and Cost Impacts</u>

Combined-Cycle Gas Turbines

Combined-cycle gas turbines are inherently more efficient than simple-cycle gas turbines because they extract and use exhaust heat that would otherwise be wasted.

A combined-cycle gas turbine is proposed as part of this project in order to efficiently provide the bulk of electricity production. The proposed simple-cycle turbines augment the combined-cycle unit by providing load-following capability and black start capability.

Reciprocating IC Engines

Reciprocating IC engines are fast-starting, but the largest natural gas-fired IC engine currently available is the approximately 9 MW Wärtsilä 20V34SG.[30] The nominal 330 MW size of the proposed combined cycle portion of the project would require over 35 of these engines, which would result in a far more complex and expensive plant and control system. Furthermore, BACT for NOx from engines of this type was recently determined to be 5 ppm, so NOx emissions from a comparable reciprocating engine plant would be approximately twice the NOx emissions from the proposed simple-cycle gas turbine project. Therefore, reciprocating IC engine technology is not considered BACT for the project.

Carbon Capture and Storage

CCS technology applicable to natural gas-fired projects refers to post-combustion capture. EPA's Interagency Task Force on Carbon Capture and Storage[31] found the following:

> *Post-combustion CO_2 capture … is challenging for the following reasons:*
>
> - *A high volume of gas must be treated because the CO_2 is dilute (13 to 15 percent by volume in coal-fired systems, three to four percent in natural-gas-fired systems);*
> - *The flue gas is at low pressure (near atmosphere);*
> - *trace impurities (particulate matter [PM], sulfur oxides [SOx], nitrogen oxides [NOx], etc.) can degrade the CO_2 capture materials; and*
> - *Compressing captured CO_2 from near atmospheric pressure to pipeline pressure (about 2,000 pounds per square inch absolute) requires a large auxiliary power load…Installing current amine post-combustion CO_2 capture technology on new conventional subcritical, supercritical, and ultra-supercritical coal-fired power plants would increase the COE by about 80 percent. Further, the large quantity of energy required to regenerate the amine solvent and compress the CO_2 to pipeline conditions would result in about a 30 percent energy penalty.*

The International Energy Agency estimates that "CCS can reduce CO_2 emissions from power plants…by more than 85%, and power plant efficiency by about 8-12 percentage points."[32] Although this energy penalty is for coal-fired plants and is not directly applicable to natural gas firing, it is expected to be reasonably representative of the

[30] *http://powerservices.lakho.com/2009/05/19/largest-natural-gas-reciprocating-engine-plant/*
[31] EPA, "Report of the Interagency Task Force on Carbon Capture and Storage," 2010, pp. 29-30 *http://www.epa.gov/climatechange/downloads/CCS-Task-Force-Report-2010.pdf*
[32] IEA Energy Technology Essentials, December 2006. *http://www.iea.org/techno/essentials.htm*

energy penalty for a natural gas-fired system because the lower content of CO_2 in gas turbine exhaust would not necessarily result in an efficiency savings (separation is still required, and there are no data to suggest that the differences in CO_2 concentrations between coal exhaust and gas turbine exhaust would result in lower separation costs). Assuming a minimum 8% energy penalty for CCS, the project would have to generate 8% more electricity to provide energy for CCS without reducing the electricity supply provided by the facility. Criteria pollutant and GHG emissions would also be 8% higher. In light of the energy and emissions penalties, the cost, and the lack of commercial availability, CCS is not considered BACT for the proposed project.

Step 5 – Determine BACT/Present Conclusions

The use of this highly efficient combined-cycle gas turbine technology, combined with good combustion operation and maintenance to maintain optimum efficiency, is determined to be BACT for GHG.

SUMMARY

Recent BACT determinations for criteria pollutants from similar gas turbine projects are summarized in Tables 12 and 13.

Table 12
Combined-Cycle Gas Turbine BACT Determinations (EPA RBLC Clearinghouse)

Facility/Location	Date Permit Issued	Equipment/Rating	NOx Limit/Control Technology	CO Limit/Control Technology	VOC Limit/Control Technology
Warren County Power[a]	December 2010	Mitsubishi M501, 300 MW	2.0 ppm	2.4 ppm (1-hour)	1.6 ppm
Kleen Energy Systems[b]	December 2010	Siemens SGT6-5000F 2 turbines, 580 MW total	2.0 ppm Low NOx burner and SCR	1.7 ppm (1-hour)	5 ppm (1-hour)
Avenal/California	June 2011	2 turbines GE 7FA 180 MW each	2.0 ppm	2.0 ppm	-N/A-
Thomas Ferguson Power Plant/Texas	September 2011	2 turbines GE 7FA, 195 MW each	2.0 ppm	4.0 ppm	2.0 ppm
Palmdale/California	October 2011	2 turbines GE 7FA, 154 MW each	2.0 ppm	1.5 ppm	-N/A-
Calhoun Port Authority/Texas	September 2012	GE 7FA, 195 MW	2.0 ppm	4.0 ppm	2.0 ppm
Deer Park Energy Center/Texas	September 2012	Siemens 501F, 150 MW	2.0 ppm	4.0 ppm	2.0 ppm
Channel Energy Center/Texas	October 2012	Siemens 501F, 150 MW	2.0 ppm	4.0 ppm	2.0 ppm

Notes:
a. Facility not yet in operation
b. Facility commenced operation in November 2011.

Table 13
Summary of BACT Determinations (CEC Decisions)

Facility/District	Decision Date	NOx Limit/ Control Technology	CO Limit/Control Technology	VOC Limit/Control Technology
Inland Empire	2003	2.0 ppm SCR	4.0 (1 hour) Oxidation Catalyst	2.0 ppm Oxidation catalyst
El Segundo	2010	2.0 ppm SCR	2.0 ppm (1 hour) Oxidation catalyst	2.0 ppm Oxidation catalyst
GWF Tracy	2010	2.0 ppm SCR	2.0 ppm (1 hour) Oxidation catalyst	2.0 ppm Oxidation catalyst
Oakley Generating Station	2011	2.0 ppm SCR	2.0 ppm (1 hour) Oxidation catalyst	2.0 ppm Oxidation catalyst
Watson Cogeneration	2012	2.0 ppm SCR	2.0 ppm (1 hour) Oxidation catalyst	2.0 ppm Oxidation catalyst

BACT for the Combined-Cycle CTG: Startup/Shutdown

Startup and shutdown periods are a normal part of the operation of combined-cycle power plants such as ESPFM. BACT must also be applied during the startup and shutdown periods of gas turbine operation. The BACT limits discussed in the previous section apply to steady-state operation, when the turbines have reached stable operations and the emission control systems are fully operational.

NOx EMISSIONS

Step 1 – Identify All Possible Control Technologies

Listed below are the technologies identified for control of NOx during startups and shutdowns.

- Selective Catalytic Reduction (SCR) system capable of continuously complying with a limit of 2.5 ppmvd @15% O_2 (1-hour average)
- Fast-start technologies (i.e., Rapid Response)
- Operating practices to minimize the duration of startup and shutdown

The project will utilize all of these control techniques.

Step 2 – Eliminate Technologically Infeasible Options

During gas turbine startup, there are equipment and process requirements that must be met in sequential order to protect the equipment. In the case of combined-cycle turbine projects, many of these require holding the gas turbine at low loads, where operation is inefficient and emissions are relatively high, to allow the HRSG and steam turbine to warm up, and to establish steam turbine seals and condenser vacuum. In the case of combustion turbines with dry low NOx combustors, at low turbine loads the combustors are not yet operating in lean pre-mix mode so turbine NOx emission rates are also high during startup.

For all turbine technologies, incomplete combustion at low loads results in higher CO and VOC emission rates. Furthermore, the post-combustion controls that are used to achieve additional emissions reductions (SCR and oxidation catalyst) require that specific exhaust temperature ranges be reached to be fully effective. The use of SCR to control NOx is not technically feasible when the surface of the SCR catalyst is below the manufacturer's recommended operating range. When catalyst surface temperatures are low, ammonia will not react completely with the NOx, resulting in excess NOx emissions or excess ammonia slip or both. The oxidation catalyst is not effective at controlling CO emissions when exhaust temperature is below the optimal temperature range. Therefore, exhaust gas controls used to achieve BACT for normal operations are not feasible control techniques during startups and shutdowns.

This "top-down" BACT analysis will consider the following NOx emission limitations:

- Operating practices to minimize emissions during startup and shutdown; and
- Design features to minimize the duration of startup and shutdown.

Step 3 – Rank Remaining Control Technologies by Control Effectiveness

Operating Practices to Minimize Emissions during Startup and Shutdown

There are basic principles of operation, or Best Management Practices, that minimize emissions during startups and shutdowns. These Best Management Practices are outlined below.

- During a startup, bring the gas turbine to the minimum load necessary to achieve compliance with the applicable NOx and CO emission limits as quickly as possible, consistent with the equipment manufacturers' recommendations and safe operating practices.

- During a startup, initiate ammonia injection to the SCR system as soon as the SCR catalyst temperature and ammonia vaporization system have reached their minimum operating temperatures.

- During a shutdown, once the turbine reaches a load that is below the minimum load necessary to maintain compliance with the applicable NOx and CO emission limits, reduce the gas turbine load to zero as quickly as possible, consistent with the equipment manufacturers' recommendations and safe operating practices.

- During a shutdown, maintain ammonia injection to the SCR system as long as the SCR catalyst temperature and ammonia vaporization system remain above their minimum operating temperatures.

A key underlying consideration of these Best Management Practices is the overall safety of the plant staff by promoting operation within the limitations of the equipment and systems, and allowing for operator judgment and response times to respond to alarms and trips during the startup sequence.

Design Features to Minimize the Duration of Startup and Shutdown

An additional technique to reduce startup emissions is to minimize the amount of time the gas turbine spends in startup. The proposed turbine is equipped with Fast Start technology, which is a suite of design features that maintains system components in a state of readiness to allow the gas turbine to ramp up to full load more quickly and bring the SCR and oxidation catalysts to operating temperature more quickly.

Step 4 – Evaluate the Most Effective Control Technology Considering Environmental, Energy, and Cost Impacts

Utilizing best operating practices to minimize emissions during startups and shutdowns has no adverse environmental or energy impacts, nor does it require additional capital expenditure.

The approach of reducing startup/shutdown duration has no adverse environmental or energy impacts, and the use of fast-start technology minimizes startup/shutdown duration.

Step 5 - Determine BACT/Present Conclusions

BACT for NOx during startups/shutdowns is the use of operating systems/practices that reduce the duration of startups and shutdowns to the greatest extent feasible, and the use of operational techniques to initiate ammonia injection as soon as possible during a startup. Therefore, BACT is determined to be the use of combined-cycle gas turbine technology and the application of operating systems/practices that minimize startup and shutdown durations, in combination with the use of operational techniques to initiate ammonia injection as soon as possible during a startup.

CO EMISSIONS

Step 1 – Identify All Possible Control Technologies

The CO control technologies under consideration for startups and shutdowns are ranked as follows:

- Oxidation catalyst unit capable of achieving 2 ppmvd @ 15% O_2
- Fast-start technologies
- Operating practices to minimize the duration of startup and shutdown

Step 2 – Eliminate Technologically Infeasible Options

None of the proposed alternatives is infeasible for this application.

Step 3 – Rank Remaining Control Technologies by Control Effectiveness

Ranking for the control technologies is as indicated in Step 1.

Step 4 – Evaluate the Most Effective Control Technology Considering Environmental, Energy, and Cost Impacts

Similar to the discussion above for NOx, CO emissions during startup and shutdown are minimized by minimizing the length of time that the turbine fires while the oxidation catalyst is not in its operating temperature range.

Step 5 – Determine BACT/Present Conclusions

BACT is determined to be the use of combined-cycle gas turbine technology and the application of operating systems/practices that minimize startup and shutdown durations.

VOC EMISSIONS

Step 1 – Identify All Possible Control Technologies

The VOC control technologies under consideration for startups and shutdowns are ranked as follows:

- Fast-start technologies
- Operating practices to minimize the duration of startup and shutdown

Step 2 – Eliminate Technologically Infeasible Options

None of the proposed alternatives is infeasible for this application.

Step 3 – Rank Remaining Control Technologies by Control Effectiveness

Ranking for the control technologies is as indicated in Step 1.

Step 4 – Evaluate the Most Effective Control Technology Considering Environmental, Energy, and Cost Impacts

VOC emissions during startup and shutdown are minimized by minimizing the duration of startup and shutdown.

Step 5 – Determine BACT/Present Conclusions

BACT is determined to be the use of combined-cycle gas turbine technology and the application of operating systems/practices that minimize startup and shutdown durations.

SULFUR OXIDE EMISSIONS

Step 1 – Identify All Possible Control Technologies

The SOx control technologies under consideration for startups and shutdowns are ranked as follows:

- Use of natural gas as a fuel
- Fast-start technologies
- Operating practices to minimize the duration of startup and shutdown

Step 2 – Eliminate Technologically Infeasible Options

None of the proposed alternatives is infeasible for this application.

Step 3 – Rank Remaining Control Technologies by Control Effectiveness

Ranking for the control technologies is as indicated in Step 1.

Step 4 – Evaluate the Most Effective Control Technology Considering Environmental, Energy, and Cost Impacts

SOx emissions during startup and shutdown are minimized by minimizing the duration of startup and shutdown.

Step 5 – Determine BACT/Present Conclusions

BACT is determined to be the use of combined-cycle gas turbine technology and the application of operating systems/practices that minimize startup and shutdown durations.

PM/PM_{10}/$PM_{2.5}$ EMISSIONS

Step 1 – Identify All Possible Control Technologies

The PM control technologies under consideration for startups and shutdowns are ranked as follows:

- Use of natural gas as a fuel
- Fast-start technologies
- Operating practices to minimize the duration of startup and shutdown

Step 2 – Eliminate Technologically Infeasible Options

None of the proposed alternatives is infeasible for this application.

Step 3 – Rank Remaining Control Technologies by Control Effectiveness

Ranking for the control technologies is as indicated in Step 1.

Step 4 – Evaluate the Most Effective Control Technology Considering Environmental, Energy, and Cost Impacts

PM emissions during startup and shutdown are minimized by minimizing the duration of startup and shutdown.

Step 5 – Determine BACT/Present Conclusions

BACT is determined to be the use of combined-cycle gas turbine technology and the application of operating systems/practices that minimize startup and shutdown durations.

GHG EMISSIONS

Step 1 – Identify All Possible Control Technologies

The GHG control technologies under consideration for startups and shutdowns are ranked as follows:

- Use of natural gas as a fuel
- Fast-start technologies
- Operating practices to minimize the duration of startup and shutdown

Step 2 – Eliminate Technologically Infeasible Options

None of the proposed alternatives is infeasible for this application.

Step 3 – Rank Remaining Control Technologies by Control Effectiveness

Ranking for the control technologies is as indicated in Step 1.

Step 4 – Evaluate the Most Effective Control Technology Considering Environmental, Energy, and Cost Impacts

GHG emissions during startup and shutdown are minimized by minimizing the duration of startup and shutdown.

Step 5 – Determine BACT/Present Conclusions

BACT is determined to be the use of combined-cycle gas turbine technology and the application of operating systems/practices that minimize startup and shutdown durations.

SUMMARY

Proposed BACT determinations for the ESPFM combined-cycle gas turbine are summarized in Table 14.

Table 14
Proposed BACT Determinations for ESPFM Combined-Cycle Gas Turbine

Pollutant	Proposed BACT Determination
Nitrogen Oxides	Dry low-NOx combustors and SCR system, 2.0 ppmc[a], 1-hour average, with excursions under specific conditions; no CCS
Sulfur Dioxide	Natural gas fuel (sulfur content not to exceed 0.75 grain/100 scf short-term average, 0.25 grains/100 scf long-term average)
Carbon Monoxide	Good combustion practices and oxidation catalyst, 2.0 ppmc, 1-hour average
VOC	Good combustion practices, 2.0 ppmc, 1-hour average
PM_{10}	Natural gas fuel, 9.5 PM_{10} lbs/hr
$PM_{2.5}$	Natural gas fuel, 9.5 $PM_{2.5}$ lbs/hr
GHGs	Combined-cycle gas turbine technology, good combustion practices
Ammonia	5 ppm ammonia slip
Startup/Shutdown	GE Fast Start combined-cycle gas turbine technology, Best operating practices to minimize startup/shutdown times and emissions

Note:
a. ppmc: parts per million by volume, corrected to 15% O_2

BACT for the Auxiliary Boiler

The emissions unit for which BACT is being considered is a nominal 36 MMBtu/hr auxiliary boiler.

NOx EMISSIONS

Step 1 – Identify All Possible Control Technologies

NOx is formed during combustion through two mechanisms: (1) thermal NOx, which is the oxidation of elemental nitrogen in combustion air; and (2) fuel NOx, which is the oxidation of fuel-bound nitrogen. Since natural gas is relatively free of fuel-bound nitrogen, the contribution of this second mechanism to the formation of NOx emissions in natural gas-fired equipment is minimal and thermal NOx is the chief source of NOx emissions. Thermal NOx formation is a function of residence time, oxygen level, and flame temperature, and can be minimized by controlling these elements in the design of the combustion equipment.

There are two basic means of controlling NOx emissions from boilers: combustion controls and post-combustion controls. Combustion controls act to reduce the formation of NOx during the combustion process, while post-combustion controls remove NOx from the exhaust stream. Combustion control technologies for this type of boiler application include low-NOx burners, flue gas recirculation (FGR), and staged combustion. Post-combustion controls include SCR and selective non-catalytic reduction (SNCR). These are discussed below in order of most effective to least effective.

Step 2 – Eliminate Technologically Infeasible Options

Selective Catalytic Reduction

The effectiveness of an SCR system requires the catalyst, and thus the treated exhaust stream, to be within a certain temperature range for the NOx reduction reaction to take place. The auxiliary boiler will be operated to support the fast start turbine startup process. The majority of boiler operations are expected to be at low load, and even at full load the exhaust gas temperature is expected to be 300°F, which is below the minimum needed for effective SCR control. While there may be areas within the boiler itself within the correct temperature range, the wide range in boiler firing rate (25% of full load most of the time, 100% full load during turbine startup) will affect the temperature profile within the boiler; and there is difficulty in finding an appropriate place inside the boiler where ammonia could be injected and mixed properly. Therefore, this technology is not considered technically feasible for the auxiliary boiler in this application.

Selective Noncatalytic Reduction (SNCR)

SNCR involves injection of ammonia or urea with proprietary conditions into the exhaust gas stream without a catalyst. SNCR technology requires gas temperatures in the range of 1200 to 2000°F. The exhaust temperature for the proposed auxiliary boiler is 300°F, well below the minimum SNCR operating temperature. While there may be areas within the boiler itself within the correct temperature range, the wide range in boiler firing rate (25% of full load most of the time, 100% full load during turbine startup) will affect the temperature profile within the boiler; and there is difficulty in finding an appropriate place inside the boiler where ammonia could be injected and mixed properly. Therefore, SNCR is not technically feasible for this application.

Ultra-Low NOx Burners with Flue Gas Recirculation

Low-NOx burners with FGR are commonly used on industrial-sized package boilers such as the ESP auxiliary boiler. These burners minimize the formation of thermal NOx and FGR reduces the oxygen in the combustion zone to further reduce NOx formation. Ultra-low NOx burners with FGR can achieve NOx emission rates of 7 to 9 ppmvd @ 3% O_2 without post-combustion controls. A 9 ppm emission rate was recently accepted as BACT for the Colusa Generating Station auxiliary boiler and was considered the lowest technologically feasible emission rate for that particular application. A summary of the permitted emissions limits for other, similar boilers is provided in Table 15.

Step 3 – Rank Remaining Control Technologies by Control Effectiveness

The only remaining control technology is ultra-low NOx burners with FGR.

Step 4 – Evaluate the Most Effective Control Technology Considering Environmental, Energy, and Cost Impacts

District BACT Determinations

The SJVAPCD's BACT determination for boilers in this size range with variable loads shows that less than 15 ppmc is considered achieved in practice while 9 ppm is considered technically feasible.

The BAAQMD has determined that 9 ppmc is achieved in practice, while 7 ppmc is considered technologically feasible. However, the BAAQMD BACT guideline indicates that SCR is needed to achieve 7 ppmc, and, as discussed above, SCR is not feasible for this application.

SCAQMD provides BACT information in the form of listings of recent BACT determinations.[33] The following NOx BACT levels are listed for boilers in the size range of the proposed boiler (36 MMBH):

- 39 MMBH, very low usage (1 day per month, 1 week per year): 9 ppm. (2004)
- 79 MMBH, 9ppm (1999)
- 49 MMBH, low usage (25% capacity, 2 weeks/quarter): 9 ppm (1999)
- 32 MMBH, steady state and 60% load: 7 ppm using SCR (1999)
- 24-33 MMBH, load following: 7 ppm using SCR (1999)
- 22 MMBH, load following: 9 ppm (2002)
- 21 MMBH, steady low load: 7 ppm using SCR (2003)

Step 5 – Determine BACT/Present Conclusions

BACT must be at least as stringent as the most stringent limit achieved in practice, federal NSPS, or district prohibitory rule. Based upon the results of this analysis, the proposed 9 ppm NOx limit represents BACT for this application.

[33] SCAQMD, BACT Guidelines—Overview (July 2006). p 1

Table 15
Recent NOx and CO BACT Determinations for Medium-Sized Auxiliary Boilers

Facility	District/State	Heat Input Rating (MMBtu/hr HHV)	NOx Limit	CO Limit	Date Permit Issued	Source
Colusa Generating Station	EPA Region 9	44	9 ppm	50 ppm	May 2008	CEC final decision
Genentech	BAAQMD	97	9 ppm	50 ppm	September 2005	CARB BACT Clearinghouse
Medimmune, Inc	Maryland	29.4	9 ppm	n/a	January 2008	RBLC # MD-0037
CPV Warren	Virginia	97	0.011 lb/MMBtu [a]	0.036 lb/MMBtu [c]	January 2008	RBLC # VA-0308
Minnesota Steel Industries	Minnesota	99	0.035 lb/MMBtu [b]	0.08 lb/MMBtu [d]	September 2007	RBLC # MN-0070
Thyssenkrupp Steel and Stainless USA, LLC	Alabama	64.9	0.035 lb/MMBtu [b]	0.040 lb/MMBtu [c]	August 2007	RBLC # AL-0230
Daimler Chrysler Corporation	Ohio	20.4	0.0350 lb/MMBtu [b]	0.0830 lb/MMBtu [d]	May 2007	RBLC # OH-0309
Kal Kan	SCAQMD	78.6	9 ppm	400 ppm	October 1999	Application 181183
UCI Med Center	SCAQMD	48.6	9 ppm	50 ppm	September 1999	Application 248532
Coca Cola	SCAQMD	32.5	7 ppm	50 ppm	December 1999	Application 352348
Children's Hospital	SCAQMD	24.2, 33.9	7 ppm	50 ppm	December 1999	Application 347790
Cosmetic Laboratories	SCAQMD	21.5	9 ppm	100 ppm	December 2002	Application 385770
La Corr Packaging	SCAQMD	21	7 ppm	50 ppm	September 2000	Application 385770
LA County Internal Services	SCAQMD	39	9 ppm	50 ppm	May 2004	Application 405470

Notes:
a. Equivalent to approximately 9 ppmc NOx.
b. RBLC record shows 0.0035 lb/MMBtu; however, based on rated heat input and hourly limit, this is believed to be a typographical error. This is equivalent to approximately 27 ppmc NOx.
c. Equivalent to approximately 50 ppmc CO.
d. Equivalent to approximately 100 ppmc CO.

CO EMISSIONS

Step 1 – Identify All Possible Control Technologies

CO emitted from boilers is the result of incomplete combustion of fuel. Use of good combustion practices to ensure complete combustion is generally considered BACT for CO.

Step 2 – Eliminate Technologically Infeasible Options

The only technology under consideration is use of good combustion practices to ensure complete combustion.

Step 3 – Rank Remaining Control Technologies by Control Effectiveness

The only technology under consideration is use of good combustion practices to ensure complete combustion.

Step 4 – Evaluate the Most Effective Control Technology Considering Environmental, Energy, and Cost Impacts

SCAQMD staff have indicated that the current BACT level for CO from boilers at major sources is 50 ppm. Recent BACT determinations listed in Part B of the SCAQMD BACT Guidelines are shown in Table 15.

Step 5 – Determine BACT/Present Conclusions

BACT must be at least as stringent as the most stringent level achieved in practice, required in a federal NSPS or district prohibitory rule, or considered technologically feasible. The proposed CO emission limit of 50 ppmvd @ 15% O_2 on a 15-minute average basis is BACT for this source.

VOC EMISSIONS

Step 1 – Identify All Possible Control Technologies

VOC emissions during natural gas combustion result from incomplete combustion of the fuel gas. VOC emissions are minimized by combustion practices that promote high combustion temperatures, long residence times at those temperatures, and turbulent mixing of fuel and combustion air. Since those practices tend to increase NOx emissions, the effectiveness of the NOx control system may affect the ability of the boiler to achieve low VOC emission rates.

Step 2 – Eliminate Technologically Infeasible Options

No technologies have been eliminated at this step.

Step 3 – Rank Remaining Control Technologies by Control Effectiveness

Only one technology has been identified.

Step 4 – Evaluate the Most Effective Control Technology Considering Environmental, Energy, and Cost Impacts

District BACT Determinations

The SJVAPCD's BACT determination for boilers in this size range with variable loads shows that the use of natural gas fuel is considered to be BACT for VOCs.

The BAAQMD has determined that BACT for boilers in this size range is the use of good combustion practices for VOC control.

None of the SCAQMD determinations for BACT for boilers in this size range address VOC.

Step 5 – Determine BACT/Present Conclusions

BACT must be at least as stringent as the most stringent limit achieved in practice, federal NSPS, or district prohibitory rule. Based upon the results of this analysis, the use of good combustion practices for VOC control is BACT for the auxiliary boiler.

SO_2 AND PM_{10} EMISSIONS

Step 1 – Identify All Possible Control Technologies

SO_2 and PM_{10} emissions from natural gas combustion result from sulfur and other impurities in the fuel. Emissions of these pollutants will be minimized through the use of low sulfur pipeline quality natural gas. There are no add-on control technologies that are effective in reducing SO_2 and PM_{10} emissions from naturally low-emitting natural gas-fired boilers.

Step 2 – Eliminate Technologically Infeasible Options

No technologies have been eliminated at this step.

Step 3 – Rank Remaining Control Technologies by Control Effectiveness

Only one technology has been identified.

Step 4 – Evaluate the Most Effective Control Technology Considering Environmental, Energy, and Cost Impacts

District BACT Determinations

The SJVAPCD and BAAQMD BACT guidelines both indicate that the use of natural gas fuel is considered BACT for boilers.

Step 5 – Determine BACT/Present Conclusions

BACT must be at least as stringent as the most stringent limit achieved in practice, federal NSPS, or district prohibitory rule. Based upon the results of this analysis, the use of pipeline-quality natural gas is BACT for the auxiliary boiler.

GHG EMISSIONS

Step 1 – Identify All Possible Control Technologies

GHG emissions are a function of the amount of fuel fired. There are no add-on controls available for a unit this size. Use of an efficient boiler and minimization of use are the only methods available for minimizing GHG emissions from this source.

Step 2 – Eliminate Technologically Infeasible Options

No technologies have been eliminated at this step.

Step 3 – Rank Remaining Control Technologies by Control Effectiveness

Only one technology has been identified.

Step 4 – Evaluate the Most Effective Control Technology Considering Environmental, Energy, and Cost Impacts

The applicant proposes to utilize an efficient boiler and to minimize use.

Step 5 – Determine BACT/Present Conclusions

Use of an efficient boiler and minimization of use is BACT for GHG emissions from this source.

SUMMARY

Proposed BACT determinations for the ESPFM auxiliary boiler are summarized in Table 16.

Table 16
Proposed BACT Determinations for ESPFM Auxiliary Boiler

Pollutant	Proposed BACT Determination
Nitrogen Oxides	Ultra-Low-NOx burner and FGR, 9 ppmc[a], 15-minute average
Sulfur Dioxide	Natural gas fuel (sulfur content not to exceed 0.75 grain/100 scf short-term average, 0.25 grains/100 scf long-term average)
Carbon Monoxide	Good combustion practices, 50.0 ppmc, 15-minute average
VOC	Good combustion practices.
PM_{10}	Natural gas fuel
$PM_{2.5}$	Natural gas fuel
GHGs	Efficient boiler operation, minimize fuel use

Note:
a. ppmc: parts per million by volume, corrected to 3% O_2

APPENDIX 3.1G – OFFSET/MITIGATION SUPPORT DATA

Table 3.1G-1
El Segundo Power Facility Modification
Operating Data for NOx RTC Calculations

Data for Unit 9					
Operating Schedule (1st Year):			**Operating Schedule (2nd Year):**		
Startup hours =	200	hours/year	Startup hours =	200	hours/year
Shutdown hours =	200	hours/year	Shutdown hours =	200	hours/year
Normal Operations =	4,641	hours/year	Normal Operations =	5,056	hours/year
Commissioning Period =	415	hours/year	Commissioning Period =	0	hours/year

Data for Units 11 and 12 (each)					
Operating Schedule (1st Year):			**Operating Schedule (2nd Year):**		
Startup hours =	480	hours/year	Startups =	480	hours/year
Shutdown hours =	480	hours/year	Shutdowns =	480	hours/year
Normal Operations =	3,719	hours/year	Normal Operations =	3,840	hours/year
Commissioning Period =	121	hours/year	Commissioning Period =	0	hours/year

Data for Auxiliary Boiler					
Operating Schedule (1st Year):			**Operating Schedule (2nd Year):**		
Normal Operations (25% load) =	3,304	hours/year	Normal Operations (25% load) =	3,304	hours/year
Normal Operations (100% load) =	33	hours/year	Normal Operations (100% load) =	33	hours/year

Table 3.1G-2
El Segundo Power Facility Modification
NOx RTC Calculations

1st Year NOx RTCs

	Hours per Year	NOx (lb/hr)	NOx (lb/year)
CTGs			
Unit 9 Startup (fast)	150	45.0	6,746
Unit 9 Startup (trad)	50	62.3	3,113
Unit 9 Shutdown	200	37.5	7,495
Unit 9 Normal Operation	4,641	17.9	83,294
Unit 9 Commissioning	415	30.1	12,478
Unit 11 Startup	480	30.4	14,580
Unit 11 Shutdown	480	10.3	4,928
Unit 11 Normal Operation	3,719	4.8	17,669
Unit 11 Commissioning	121	44.1	5,331
Unit 12 Startup	480	30.4	14,580
Unit 12 Shutdown	480	10.3	4,928
Unit 12 Normal Operation	3,719	4.8	17,669
Unit 12 Commissioning	121	44.1	5,331
CTG Totals			**198,142**
Aux Boiler (25% load)	3,304	0.10	325
Aux Boiler (100% load)	33	0.39	13
Total 1st Year Emissions (lb/year)			**198,480**
Offset Ratio			1.00
1st year RTCs (lb/year)			**198,480**

2nd Year NOx RTCs

Operating Condition 100	Hours per Year	NOx (lb/hr)	NOx (lb/year) per device
CTGs			
Unit 9 Startup (fast)	150	45.0	6,746
Unit 9 Startup (trad)	50	62.3	3,113
Unit 9 Shutdown	200	37.5	7,495
Unit 9 Normal Operation	5,056	17.9	90,742
Unit 11 Startup	480	30.4	14,580
Unit 11 Shutdown	480	10.3	4,928
Unit 11 Normal Operation	3,840	4.8	18,244
Unit 12 Startup	480	30.4	14,580
Unit 12 Shutdown	480	10.3	4,928
Unit 12 Normal Operation	3,840	4.8	18,244
CTG Totals			**183,601**
Aux Boiler (25% load)	3,304	0.10	325
Aux Boiler (100% load)	33	0.39	13
Total 2nd Year Emissions (lb/year)			**183,939**
Offset Ratio			1.00
2nd year RTCs (lb/year)			**183,939**

APPENDIX 3.1H – CUMULATIVE IMPACTS ANALYSIS EMISSION DATA

Table 3.1H-1

Public Information Provided by District—Permits Within 6 Miles of ESPFM

(Period: 1/1/2011 to 12/11/2012)

Facility ID	Facility Name	Emittent ID	Emission Amt (lbs/yr)	Appl Nbr	Equipment (BCAT) Description	loc Street Address	loc City
4735	REDONDO BEACH CITY	NOX	187	536527	I C E (>500 HP) EM ELEC GEN DIESEL	415 DIAMOND ST	REDONDO BEACH
4735	REDONDO BEACH CITY	PM10	9.5	536527	I C E (>500 HP) EM ELEC GEN DIESEL	415 DIAMOND ST	REDONDO BEACH
5259	NEUTROGENA CORP	PM10	0	535141	PLASTIC/RESIN SIZE REDUCTION	5755-60 W 96TH ST	LOS ANGELES
8582	SO CAL GAS CO/PLAYA DEL REY STORAGE FACI	NOX	29	391138	NATURAL GAS DEHYDRATION	8141 GULANA AVE	PLAYA DEL REY
8582	SO CAL GAS CO/PLAYA DEL REY STORAGE FACI	NOX	1048.32	407305		8141 GULANA AVE	PLAYA DEL REY
8582	SO CAL GAS CO/PLAYA DEL REY STORAGE FACI	NOX	850	391136	HEATER/FURNACE (5-20 MMBTU/HR) NAT GAS	8141 GULANA AVE	PLAYA DEL REY
8582	SO CAL GAS CO/PLAYA DEL REY STORAGE FACI	NOX	108501.12	539154	I C E (>500 HP) N-EM STAT NAT GAS ONLY	8141 GULANA AVE	PLAYA DEL REY
8582	SO CAL GAS CO/PLAYA DEL REY STORAGE FACI	NOX	108501.12	539155	I C E (>500 HP) N-EM STAT NAT GAS ONLY	8141 GULANA AVE	PLAYA DEL REY
8582	SO CAL GAS CO/PLAYA DEL REY STORAGE FACI	NOX	108501.12	539156	I C E (>500 HP) N-EM STAT NAT GAS ONLY	8141 GULANA AVE	PLAYA DEL REY
8582	SO CAL GAS CO/PLAYA DEL REY STORAGE FACI	PM10	94	407305		8141 GULANA AVE	PLAYA DEL REY
8582	SO CAL GAS CO/PLAYA DEL REY STORAGE FACI	PM10	171	391136	HEATER/FURNACE (5-20 MMBTU/HR) NAT GAS	8141 GULANA AVE	PLAYA DEL REY
8582	SO CAL GAS CO/PLAYA DEL REY STORAGE FACI	PM10	5853.12	539154	I C E (>500 HP) N-EM STAT NAT GAS ONLY	8141 GULANA AVE	PLAYA DEL REY
8582	SO CAL GAS CO/PLAYA DEL REY STORAGE FACI	PM10	5853.12	539155	I C E (>500 HP) N-EM STAT NAT GAS ONLY	8141 GULANA AVE	PLAYA DEL REY
8582	SO CAL GAS CO/PLAYA DEL REY STORAGE FACI	PM10	5853.12	539156	I C E (>500 HP) N-EM STAT NAT GAS ONLY	8141 GULANA AVE	PLAYA DEL REY
8648	MERLE NORMAN COSMETICS INC	PM10	0	518313		9130 BELLANCA AVE	LOS ANGELES
9755	UNITED AIRLINES INC	NOX	72.6	520595	I C E (50-500 HP) EM FIRE FGHT-DIESEL	6010 & 6020 AVION DR	LOS ANGELES
9755	UNITED AIRLINES INC	NOX	483.6	520588	I C E (50-500 HP) EM ELEC GEN-DIESEL	6010 & 6020 AVION DR	LOS ANGELES
9755	UNITED AIRLINES INC	NOX	537.5	520589	I C E (50-500 HP) N-EM PORT N-RENT DIESE	6010 & 6020 AVION DR	LOS ANGELES
9755	UNITED AIRLINES INC	NOX	426	520591	I C E (>500 HP) EM ELEC GEN DIESEL	6010 & 6020 AVION DR	LOS ANGELES
9755	UNITED AIRLINES INC	NOX	7862.4	522810	I C E (50-500 HP) N-EM PORT N-RENT DIESE	6010 & 6020 AVION DR	LOS ANGELES
9755	UNITED AIRLINES INC	PM	34.32	520588	I C E (50-500 HP) EM ELEC GEN-DIESEL	6010 & 6020 AVION DR	LOS ANGELES
9755	UNITED AIRLINES INC	PM	6	520591	I C E (>500 HP) EM ELEC GEN DIESEL	6010 & 6020 AVION DR	LOS ANGELES
9755	UNITED AIRLINES INC	PM10	17.16	520593	ABRASIVE BLASTING (CABINET/MACHINE/ROOM)	6010 & 6020 AVION DR	LOS ANGELES
9755	UNITED AIRLINES INC	PM10	5.2	520595	I C E (50-500 HP) EM FIRE FGHT-DIESEL	6010 & 6020 AVION DR	LOS ANGELES
9755	UNITED AIRLINES INC	PM10	10	520589	I C E (50-500 HP) N-EM PORT N-RENT DIESE	6010 & 6020 AVION DR	LOS ANGELES
9755	UNITED AIRLINES INC	PM10	116.48	522810	I C E (50-500 HP) N-EM PORT N-RENT DIESE	6010 & 6020 AVION DR	LOS ANGELES
10292	THE AEROSPACE CORP UNIT NO.02	NOX	436.8	511302	BOILER (<5 MMBTU/HR) NAT GAS ONLY	2350 E EL SEGUNDO	EL SEGUNDO
10292	THE AEROSPACE CORP UNIT NO.02	NOX	524.16	511300	BOILER (5-20 MMBTU/HR) NAT GAS ONLY	2350 E EL SEGUNDO	EL SEGUNDO
10292	THE AEROSPACE CORP UNIT NO.02	NOX	524.16	511301	BOILER (5-20 MMBTU/HR) NAT GAS ONLY	2350 E EL SEGUNDO	EL SEGUNDO
10292	THE AEROSPACE CORP UNIT NO.02	NOX	524.16	511303	BOILER (<5 MMBTU/HR) NAT GAS ONLY	2350 E EL SEGUNDO	EL SEGUNDO
10292	THE AEROSPACE CORP UNIT NO.02	PM10	262.08	511302	BOILER (<5 MMBTU/HR) NAT GAS ONLY	2350 E EL SEGUNDO	EL SEGUNDO
10292	THE AEROSPACE CORP UNIT NO.02	PM10	262.08	511303	BOILER (<5 MMBTU/HR) NAT GAS ONLY	2350 E EL SEGUNDO	EL SEGUNDO
10292	THE AEROSPACE CORP UNIT NO.02	PM10	349.44	511300	BOILER (5-20 MMBTU/HR) NAT GAS ONLY	2350 E EL SEGUNDO	EL SEGUNDO
10292	THE AEROSPACE CORP UNIT NO.02	PM10	349.44	511301	BOILER (5-20 MMBTU/HR) NAT GAS ONLY	2350 E EL SEGUNDO	EL SEGUNDO
13844	CHROMPLATE COMPANY	PM10	0	497471		1127 W HILLCREST BLVD	INGLEWOOD
13844	CHROMPLATE COMPANY	PM10	0	498878	TANK CHROME PLATING HEXAVALENT	1127 W HILLCREST BLVD	INGLEWOOD
13844	CHROMPLATE COMPANY	PM10	0	498879	TANK CHROME PLATING HEXAVALENT	1127 W HILLCREST BLVD	INGLEWOOD
15660	QUALITY EQUIP RENTALS	NOX	4.16	513248	SPACE HEATER,PORTABLE,<600,000BTU/HR,DIESEL/OIL FIRED	711-717 N LA BREA AVE	INGLEWOOD
15660	QUALITY EQUIP RENTALS	NOX	4.16	513249	SPACE HEATER,PORTABLE,<600,000BTU/HR,DIESEL/OIL FIRED	711-717 N LA BREA AVE	INGLEWOOD
15660	QUALITY EQUIP RENTALS	NOX	4.16	513250	SPACE HEATER,PORTABLE,<600,000BTU/HR,DIESEL/OIL FIRED	711-717 N LA BREA AVE	INGLEWOOD
15660	QUALITY EQUIP RENTALS	NOX	4.16	513251	SPACE HEATER,PORTABLE,<600,000BTU/HR,DIESEL/OIL FIRED	711-717 N LA BREA AVE	INGLEWOOD
15660	QUALITY EQUIP RENTALS	NOX	4.16	513253	SPACE HEATER,PORTABLE,<600,000BTU/HR,DIESEL/OIL FIRED	711-717 N LA BREA AVE	INGLEWOOD
15660	QUALITY EQUIP RENTALS	PM10	4.16	513248	SPACE HEATER,PORTABLE,<600,000BTU/HR,DIESEL/OIL FIRED	711-717 N LA BREA AVE	INGLEWOOD
15660	QUALITY EQUIP RENTALS	PM10	4.16	513249	SPACE HEATER,PORTABLE,<600,000BTU/HR,DIESEL/OIL FIRED	711-717 N LA BREA AVE	INGLEWOOD
15660	QUALITY EQUIP RENTALS	PM10	4.16	513250	SPACE HEATER,PORTABLE,<600,000BTU/HR,DIESEL/OIL FIRED	711-717 N LA BREA AVE	INGLEWOOD
15660	QUALITY EQUIP RENTALS	PM10	4.16	513251	SPACE HEATER,PORTABLE,<600,000BTU/HR,DIESEL/OIL FIRED	711-717 N LA BREA AVE	INGLEWOOD
15660	QUALITY EQUIP RENTALS	PM10	4.16	513253	SPACE HEATER,PORTABLE,<600,000BTU/HR,DIESEL/OIL FIRED	711-717 N LA BREA AVE	INGLEWOOD
18294	NORTHROP GRUMMAN CORP, AIRCRAFT DIV	NOX	524.16	526639	BOILER (5-20 MMBTU/HR) NAT GAS ONLY	ONE HORNET WAY M/S PA12/W5	EL SEGUNDO
18294	NORTHROP GRUMMAN CORP, AIRCRAFT DIV	NOX	5125.12	504172	AUTOCLAVE	ONE HORNET WAY M/S PA12/W5	EL SEGUNDO

Table 3.1H-1, cont.

Facility ID	Facility Name	Emittent ID	Emission Amt (lbs/yr)	Appl Nbr	Equipment (BCAT) Description	loc Street Address	loc City
18294	NORTHROP GRUMMAN CORP, AIRCRAFT DIV	PM10	174.72	502552		ONE HORNET WAY M/S PA12/W5	EL SEGUNDO
18294	NORTHROP GRUMMAN CORP, AIRCRAFT DIV	PM10	174.72	502553		ONE HORNET WAY M/S PA12/W5	EL SEGUNDO
18294	NORTHROP GRUMMAN CORP, AIRCRAFT DIV	PM10	349.44	526639	BOILER (5-20 MMBTU/HR) NAT GAS ONLY	ONE HORNET WAY M/S PA12/W5	EL SEGUNDO
18294	NORTHROP GRUMMAN CORP, AIRCRAFT DIV	PM10	990.08	504172	AUTOCLAVE	ONE HORNET WAY M/S PA12/W5	EL SEGUNDO
20421	BLUE DIAMOND INGLEWOOD ASPHALT CORP	NOX	7913.88	511386	ASPHALT BLENDING/BATCHING EQUIPMENT	441 W RAILROAD PL	INGLEWOOD
20421	BLUE DIAMOND INGLEWOOD ASPHALT CORP	PM10	0	523089		441 W RAILROAD PL	INGLEWOOD
20421	BLUE DIAMOND INGLEWOOD ASPHALT CORP	PM10	1170.78	511386	ASPHALT BLENDING/BATCHING EQUIPMENT	441 W RAILROAD PL	INGLEWOOD
22312	LA AIRPORT MARRIOTT HOTEL	NOX	786.24	529696	BOILER (5-20 MMBTU/HR) NAT GAS ONLY	5855 W CENTURY BLVD	LOS ANGELES
22312	LA AIRPORT MARRIOTT HOTEL	NOX	786.24	529722	BOILER (5-20 MMBTU/HR) NAT GAS ONLY	5855 W CENTURY BLVD	LOS ANGELES
22312	LA AIRPORT MARRIOTT HOTEL	PM10	524.16	529696	BOILER (5-20 MMBTU/HR) NAT GAS ONLY	5855 W CENTURY BLVD	LOS ANGELES
22312	LA AIRPORT MARRIOTT HOTEL	PM10	524.16	529722	BOILER (5-20 MMBTU/HR) NAT GAS ONLY	5855 W CENTURY BLVD	LOS ANGELES
42278	THE AEROSPACE CORP, UNIT NO.04	NOX	121.5	525189	I C E (50-500 HP) EM ELEC GEN-DIESEL	300 S DOUGLAS ST BLDG A6B	EL SEGUNDO
42278	THE AEROSPACE CORP, UNIT NO.04	NOX	436.8	511304	BOILER (<5 MMBTU/HR) NAT GAS ONLY	300 S DOUGLAS ST BLDG A6B	EL SEGUNDO
42278	THE AEROSPACE CORP, UNIT NO.04	NOX	436.8	511305	BOILER (<5 MMBTU/HR) NAT GAS ONLY	300 S DOUGLAS ST BLDG A6B	EL SEGUNDO
42278	THE AEROSPACE CORP, UNIT NO.04	PM	3	525189	I C E (50-500 HP) EM ELEC GEN-DIESEL	300 S DOUGLAS ST BLDG A6B	EL SEGUNDO
42278	THE AEROSPACE CORP, UNIT NO.04	PM10	262.08	511304	BOILER (<5 MMBTU/HR) NAT GAS ONLY	300 S DOUGLAS ST BLDG A6B	EL SEGUNDO
42278	THE AEROSPACE CORP, UNIT NO.04	PM10	262.08	511305	BOILER (<5 MMBTU/HR) NAT GAS ONLY	300 S DOUGLAS ST BLDG A6B	EL SEGUNDO
44012	GOODMAN FOOD PROD INC	NOX	832	513194	OVEN, COOKING OR CURING	200 E BEACH AVE	INGLEWOOD
44012	GOODMAN FOOD PROD INC	NOX	832	513196	OVEN, COOKING OR CURING	200 E BEACH AVE	INGLEWOOD
44012	GOODMAN FOOD PROD INC	NOX	1048.32	527297	OVEN, COOKING OR CURING	200 E BEACH AVE	INGLEWOOD
44012	GOODMAN FOOD PROD INC	NOX	1048.32	527305	OVEN, COOKING OR CURING	200 E BEACH AVE	INGLEWOOD
44012	GOODMAN FOOD PROD INC	PM10	0	518643		200 E BEACH AVE	INGLEWOOD
44012	GOODMAN FOOD PROD INC	PM10	1539.2	513194	OVEN, COOKING OR CURING	200 E BEACH AVE	INGLEWOOD
44012	GOODMAN FOOD PROD INC	PM10	1539.2	513196	OVEN, COOKING OR CURING	200 E BEACH AVE	INGLEWOOD
44012	GOODMAN FOOD PROD INC	PM10	1592	527297	OVEN, COOKING OR CURING	200 E BEACH AVE	INGLEWOOD
44012	GOODMAN FOOD PROD INC	PM10	1592	527305	OVEN, COOKING OR CURING	200 E BEACH AVE	INGLEWOOD
48634	HAWTHORNE HOSPITAL	NOX	107.8	520342	I C E (50-500 HP) EM ELEC GEN-DIESEL	13300 S HAWTHORNE BLVD	HAWTHORNE
48634	HAWTHORNE HOSPITAL	PM10	7.2	520342	I C E (50-500 HP) EM ELEC GEN-DIESEL	13300 S HAWTHORNE BLVD	HAWTHORNE
74693	FEDERAL EXPRESS, LAX OPERATIONS	NOX	250	504947		7401 WORLD WEST WAY	LOS ANGELES
74693	FEDERAL EXPRESS, LAX OPERATIONS	NOX	250	504948		7401 WORLD WEST WAY	LOS ANGELES
74693	FEDERAL EXPRESS, LAX OPERATIONS	NOX	250	504946		7401 WORLD WEST WAY	LOS ANGELES
74693	FEDERAL EXPRESS, LAX OPERATIONS	PM	520	504947		7401 WORLD WEST WAY	LOS ANGELES
74693	FEDERAL EXPRESS, LAX OPERATIONS	PM	520	504948		7401 WORLD WEST WAY	LOS ANGELES
74693	FEDERAL EXPRESS, LAX OPERATIONS	PM	520	504946		7401 WORLD WEST WAY	LOS ANGELES
74693	FEDERAL EXPRESS, LAX OPERATIONS	PM10	260	504947		7401 WORLD WEST WAY	LOS ANGELES
74693	FEDERAL EXPRESS, LAX OPERATIONS	PM10	260	504948		7401 WORLD WEST WAY	LOS ANGELES
74693	FEDERAL EXPRESS, LAX OPERATIONS	PM10	260	504946		7401 WORLD WEST WAY	LOS ANGELES
89127	TRI-STAR ELECTRONICS INTERNATIONAL INC	PM10	0	540020		2201 ROSECRANS AVE	EL SEGUNDO
89127	TRI-STAR ELECTRONICS INTERNATIONAL INC	PM10	0	540023	Waste Water Treating <20,000gpd,no toxic	2201 ROSECRANS AVE	EL SEGUNDO
89127	TRI-STAR ELECTRONICS INTERNATIONAL INC	PM10	0	540024	MISC STRIPPING TANK	2201 ROSECRANS AVE	EL SEGUNDO
89127	TRI-STAR ELECTRONICS INTERNATIONAL INC	PM10	320	540025	Tank, plating other	2201 ROSECRANS AVE	EL SEGUNDO
89127	TRI-STAR ELECTRONICS INTERNATIONAL INC	PM10	686.4	540021	TANK, PRECIOUS METAL - PLATING	2201 ROSECRANS AVE	EL SEGUNDO
94065	WEST BASIN MUNICIPAL WATER DISTRICT	PM10	0	528579		1935 E HUGHES WAY	EL SEGUNDO
94065	WEST BASIN MUNICIPAL WATER DISTRICT	PM10	0	530556		1935 E HUGHES WAY	EL SEGUNDO
94065	WEST BASIN MUNICIPAL WATER DISTRICT	PM10	4.6	528578	STORAGE SILO LIME & LIMESTONE	1935 E HUGHES WAY	EL SEGUNDO
94065	WEST BASIN MUNICIPAL WATER DISTRICT	PM10	4.6	530555	STORAGE SILO LIME & LIMESTONE	1935 E HUGHES WAY	EL SEGUNDO
101140	JIM & JACK INC	NOX	353.6	528906		1601 E GRAND AVE	EL SEGUNDO
101140	JIM & JACK INC	NOX	353.6	528907		1601 E GRAND AVE	EL SEGUNDO
101140	JIM & JACK INC	NOX	780	523909		1601 E GRAND AVE	EL SEGUNDO
101140	JIM & JACK INC	PM	0	522519		1601 E GRAND AVE	EL SEGUNDO
101140	JIM & JACK INC	PM	0	522520		1601 E GRAND AVE	EL SEGUNDO

Table 3.1H-1, cont.

Facility ID	Facility Name	Emittent ID	Emission Amt (lbs/yr)	Appl Nbr	Equipment (BCAT) Description	loc Street Address	loc City
101140	JIM & JACK INC	PM	842.4	523908		1601 E GRAND AVE	EL SEGUNDO
101140	JIM & JACK INC	PM10	0	522519		1601 E GRAND AVE	EL SEGUNDO
101140	JIM & JACK INC	PM10	0	522520		1601 E GRAND AVE	EL SEGUNDO
101140	JIM & JACK INC	PM10	405.6	523908		1601 E GRAND AVE	EL SEGUNDO
101140	JIM & JACK INC	PM10	405.6	523909		1601 E GRAND AVE	EL SEGUNDO
104664	ICC COLLISION CENTERS	NOX	1300	518956		4210 DEL REY AVE	MARINA DEL REY
106674	CITY OF CULVER CITY, BRADDOCK LIFT STATI	NOX	73.5	523257	I C E (50-500 HP) EM ELEC GEN-DIESEL	11285 BRADDOCK DR	CULVER CITY
106674	CITY OF CULVER CITY, BRADDOCK LIFT STATI	PM	3.5	523257	I C E (50-500 HP) EM ELEC GEN-DIESEL	11285 BRADDOCK DR	CULVER CITY
114997	RAYTHEON COMPANY	NOX	194	535632	I C E (50-500 HP) EM ELEC GEN-DIESEL	1970 E IMPERIAL HWY	EL SEGUNDO
114997	RAYTHEON COMPANY	NOX	646	535633	I C E (>500 HP) EM ELEC GEN DIESEL	1970 E IMPERIAL HWY	EL SEGUNDO
114997	RAYTHEON COMPANY	PM10	8	535632	I C E (50-500 HP) EM ELEC GEN-DIESEL	1970 E IMPERIAL HWY	EL SEGUNDO
114997	RAYTHEON COMPANY	PM10	37.4	535633	I C E (>500 HP) EM ELEC GEN DIESEL	1970 E IMPERIAL HWY	EL SEGUNDO
115536	AES REDONDO BEACH, LLC	NOX	5.72	511883	BOILER (< 2 mmBTU/HR) OIL FIRED	1100 N. HARBOR DR	REDONDO BEACH
115536	AES REDONDO BEACH, LLC	PM10	0.52	511883	BOILER (< 2 mmBTU/HR) OIL FIRED	1100 N. HARBOR DR	REDONDO BEACH
115663	EL SEGUNDO POWER, LLC	NOX	0	464316		301 VISTA DEL MAR	EL SEGUNDO
115663	EL SEGUNDO POWER, LLC	PM10	0	464316		301 VISTA DEL MAR	EL SEGUNDO
135425	SHERATON GATEWAY HOTEL- LAX	NOX	960.96	530328	BOILER (5-20 MMBTU/HR) NAT GAS ONLY	6101 W CENTURY BLVD	LOS ANGELES
135425	SHERATON GATEWAY HOTEL- LAX	NOX	960.96	530446	BOILER (5-20 MMBTU/HR) NAT GAS ONLY	6101 W CENTURY BLVD	LOS ANGELES
135425	SHERATON GATEWAY HOTEL- LAX	PM10	698.88	530328	BOILER (5-20 MMBTU/HR) NAT GAS ONLY	6101 W CENTURY BLVD	LOS ANGELES
135425	SHERATON GATEWAY HOTEL- LAX	PM10	698.88	530446	BOILER (5-20 MMBTU/HR) NAT GAS ONLY	6101 W CENTURY BLVD	LOS ANGELES
145747	CROWNE PLAZA HOTEL	NOX	0	448297	CHARBROILER - NATURAL GAS	300 N HARBOR DR	REDONDO BEACH
145747	CROWNE PLAZA HOTEL	PM10	0	448297	CHARBROILER - NATURAL GAS	300 N HARBOR DR	REDONDO BEACH
145836	AMERICAN APPAREL DYEING & FINISHING, INC	PM	0	510300		12537 CERISE AVE	HAWTHORNE
148236	AIR LIQUIDE LARGE INDUSTRIES U.S., LP	NOX	0	457657	HYDROGEN PRODUCTION PLANT	324 W EL SEGUNDO BLVD	EL SEGUNDO
148236	AIR LIQUIDE LARGE INDUSTRIES U.S., LP	NOX	0	457787		324 W EL SEGUNDO BLVD	EL SEGUNDO
148236	AIR LIQUIDE LARGE INDUSTRIES U.S., LP	NOX	6204	457788		324 W EL SEGUNDO BLVD	EL SEGUNDO
148236	AIR LIQUIDE LARGE INDUSTRIES U.S., LP	NOX	44990.4	457785	HEATER/FURNACE (>50 MMBTU/HR)PROCESS GAS	324 W EL SEGUNDO BLVD	EL SEGUNDO
148236	AIR LIQUIDE LARGE INDUSTRIES U.S., LP	PM10	0	457657	HYDROGEN PRODUCTION PLANT	324 W EL SEGUNDO BLVD	EL SEGUNDO
148236	AIR LIQUIDE LARGE INDUSTRIES U.S., LP	PM10	0	457787		324 W EL SEGUNDO BLVD	EL SEGUNDO
148236	AIR LIQUIDE LARGE INDUSTRIES U.S., LP	PM10	87.36	457788		324 W EL SEGUNDO BLVD	EL SEGUNDO
148236	AIR LIQUIDE LARGE INDUSTRIES U.S., LP	PM10	43330.56	457785	HEATER/FURNACE (>50 MMBTU/HR)PROCESS GAS	324 W EL SEGUNDO BLVD	EL SEGUNDO
148822	CHEVRON CORPORATION	NOX	1310.4	520979	SOIL TREAT VAPOR EXTRACT GASOLINE UNDER	3101 W EL SEGUNDO BLVD	HAWTHORNE
148822	CHEVRON CORPORATION	PM10	87.36	520979	SOIL TREAT VAPOR EXTRACT GASOLINE UNDER	3101 W EL SEGUNDO BLVD	HAWTHORNE
151346	CALIFORNIA PORTLAND CEMENT CO	PM10	0	543658		5299 W 111TH ST	LOS ANGELES
151346	CALIFORNIA PORTLAND CEMENT CO	PM10	83.2	513817	STORAGE SILO CEMENT	5299 W 111TH ST	LOS ANGELES
151346	CALIFORNIA PORTLAND CEMENT CO	PM10	374.4	529699	CONCRETE BATCH EQUIPMENT	5299 W 111TH ST	LOS ANGELES
151346	CALIFORNIA PORTLAND CEMENT CO	PM10	2231	511706	STORAGE SILO CEMENT	5299 W 111TH ST	LOS ANGELES
154034	CENTINELA HOSPITAL MEDICAL CENTER	NOX	659	527784	I C E (>500 HP) EM ELEC GEN DIESEL	555 E HARDY ST	INGLEWOOD
154034	CENTINELA HOSPITAL MEDICAL CENTER	NOX	659	527785	I C E (>500 HP) EM ELEC GEN DIESEL	555 E HARDY ST	INGLEWOOD
154034	CENTINELA HOSPITAL MEDICAL CENTER	NOX	1223.04	531512	BOILER (5-20 MMBTU/HR) NAT GAS ONLY	555 E HARDY ST	INGLEWOOD
154034	CENTINELA HOSPITAL MEDICAL CENTER	NOX	1223.04	531513	BOILER (5-20 MMBTU/HR) NAT GAS ONLY	555 E HARDY ST	INGLEWOOD
154034	CENTINELA HOSPITAL MEDICAL CENTER	PM10	20	527784	I C E (>500 HP) EM ELEC GEN DIESEL	555 E HARDY ST	INGLEWOOD
154034	CENTINELA HOSPITAL MEDICAL CENTER	PM10	20	527785	I C E (>500 HP) EM ELEC GEN DIESEL	555 E HARDY ST	INGLEWOOD
154034	CENTINELA HOSPITAL MEDICAL CENTER	PM10	786.24	531512	BOILER (5-20 MMBTU/HR) NAT GAS ONLY	555 E HARDY ST	INGLEWOOD
154034	CENTINELA HOSPITAL MEDICAL CENTER	PM10	786.24	531513	BOILER (5-20 MMBTU/HR) NAT GAS ONLY	555 E HARDY ST	INGLEWOOD
155828	GARRETT AVN. SVCS. LLC DBA STANDARD AERO	NOX	4193.28	483960	JET ENGINE TEST FACILITY OTHER FUEL	6201 W IMPERIAL HWY	LOS ANGELES
155828	GARRETT AVN. SVCS. LLC DBA STANDARD AERO	NOX	18607.68	483951	JET ENGINE TEST FACILITY OTHER FUEL	6201 W IMPERIAL HWY	LOS ANGELES
155828	GARRETT AVN. SVCS. LLC DBA STANDARD AERO	PM10	5	486205	Tank, plating other	6201 W IMPERIAL HWY	LOS ANGELES
155828	GARRETT AVN. SVCS. LLC DBA STANDARD AERO	PM10	87.36	526286		6201 W IMPERIAL HWY	LOS ANGELES
155828	GARRETT AVN. SVCS. LLC DBA STANDARD AERO	PM10	174.72	483952	ABRASIVE BLASTING (CABINET/MACHINE/ROOM)	6201 W IMPERIAL HWY	LOS ANGELES
155828	GARRETT AVN. SVCS. LLC DBA STANDARD AERO	PM10	174.72	483959		6201 W IMPERIAL HWY	LOS ANGELES

Table 3.1H-1, cont.

Facility ID	Facility Name	Emittent ID	Emission Amt (lbs/yr)	Appl Nbr	Equipment (BCAT) Description	loc Street Address	loc City
155828	GARRETT AVN. SVCS. LLC DBA STANDARD AERO	PM10	174.72	483960	JET ENGINE TEST FACILITY OTHER FUEL	6201 W IMPERIAL HWY	LOS ANGELES
155828	GARRETT AVN. SVCS. LLC DBA STANDARD AERO	PM10	262.08	483951	JET ENGINE TEST FACILITY OTHER FUEL	6201 W IMPERIAL HWY	LOS ANGELES
157262	EQUINIX OPERATING CO INC	NOX	1315	524076	I C E (>500 HP) EM ELEC GEN DIESEL	445 N DOUGLAS ST	EL SEGUNDO
157262	EQUINIX OPERATING CO INC	NOX	1315	524078	I C E (>500 HP) EM ELEC GEN DIESEL	445 N DOUGLAS ST	EL SEGUNDO
157262	EQUINIX OPERATING CO INC	NOX	1315	524079	I C E (>500 HP) EM ELEC GEN DIESEL	445 N DOUGLAS ST	EL SEGUNDO
157262	EQUINIX OPERATING CO INC	NOX	1315	524080	I C E (>500 HP) EM ELEC GEN DIESEL	445 N DOUGLAS ST	EL SEGUNDO
157262	EQUINIX OPERATING CO INC	NOX	1315	524082	I C E (>500 HP) EM ELEC GEN DIESEL	445 N DOUGLAS ST	EL SEGUNDO
157262	EQUINIX OPERATING CO INC	NOX	1315	524084	I C E (>500 HP) EM ELEC GEN DIESEL	445 N DOUGLAS ST	EL SEGUNDO
157262	EQUINIX OPERATING CO INC	NOX	1315	524085	I C E (>500 HP) EM ELEC GEN DIESEL	445 N DOUGLAS ST	EL SEGUNDO
157262	EQUINIX OPERATING CO INC	PM10	4	524076	I C E (>500 HP) EM ELEC GEN DIESEL	445 N DOUGLAS ST	EL SEGUNDO
157262	EQUINIX OPERATING CO INC	PM10	4	524078	I C E (>500 HP) EM ELEC GEN DIESEL	445 N DOUGLAS ST	EL SEGUNDO
157262	EQUINIX OPERATING CO INC	PM10	4	524079	I C E (>500 HP) EM ELEC GEN DIESEL	445 N DOUGLAS ST	EL SEGUNDO
157262	EQUINIX OPERATING CO INC	PM10	4	524080	I C E (>500 HP) EM ELEC GEN DIESEL	445 N DOUGLAS ST	EL SEGUNDO
157262	EQUINIX OPERATING CO INC	PM10	4	524082	I C E (>500 HP) EM ELEC GEN DIESEL	445 N DOUGLAS ST	EL SEGUNDO
157262	EQUINIX OPERATING CO INC	PM10	4	524084	I C E (>500 HP) EM ELEC GEN DIESEL	445 N DOUGLAS ST	EL SEGUNDO
157262	EQUINIX OPERATING CO INC	PM10	4	524085	I C E (>500 HP) EM ELEC GEN DIESEL	445 N DOUGLAS ST	EL SEGUNDO
159183	ATC GROUP SERVICES, INC.	NOX	873.6	515909	SOIL TREAT VAPOR EXTRACT GASOLINE UNDER	12806 S PRAIRIE AVE	HAWTHORNE
159183	ATC GROUP SERVICES, INC.	NOX	873.6	515910	SOIL TREAT VAPOR EXTRACT GASOLINE UNDER	12806 S PRAIRIE AVE	HAWTHORNE
159714	NANOH20	NOX	786.24	498456		750 LAIRPORT ST	EL SEGUNDO
159714	NANOH20	PM	174.72	498456		750 LAIRPORT ST	EL SEGUNDO
159714	NANOH20	PM10	174.72	498456		750 LAIRPORT ST	EL SEGUNDO
159986	FREEMAN MEDICAL BUILDING, LLC	NOX	299.5	499028	I C E (>500 HP) EM ELEC GEN DIESEL	301 PRAIRIE	INGLEWOOD
159986	FREEMAN MEDICAL BUILDING, LLC	PM10	0.5	499028	I C E (>500 HP) EM ELEC GEN DIESEL	301 PRAIRIE	INGLEWOOD
161395	ONE PERFECT LINE, LLC DBA SUPERBA COFFEE	NOX	45	502462	Coffee Roasting (50-90 lb capacity)	4040 DEL REY AVE # 6A	MARINA DEL REY
161395	ONE PERFECT LINE, LLC DBA SUPERBA COFFEE	PM10	11.25	502462	Coffee Roasting (50-90 lb capacity)	4040 DEL REY AVE # 6A	MARINA DEL REY
163088	ARKEMA INC.	NOX	524.16	516818	BOILER (5-20 MMBTU/HR) NAT GAS ONLY	19206 HAWTHORNE BLVD	TORRANCE
163088	ARKEMA INC.	NOX	4717.44	509285		19206 HAWTHORNE BLVD	TORRANCE
163088	ARKEMA INC.	PM10	87.36	542097	PAINTS, REACTION	19206 HAWTHORNE BLVD	TORRANCE
163088	ARKEMA INC.	PM10	349.44	516818	BOILER (5-20 MMBTU/HR) NAT GAS ONLY	19206 HAWTHORNE BLVD	TORRANCE
163088	ARKEMA INC.	PM10	262.08	509285		19206 HAWTHORNE BLVD	TORRANCE
165079	HAMID	NOX	250	513664		8332 OSAGE AVE	LOS ANGELES
165079	HAMID	NOX	250	513663		8332 OSAGE AVE	LOS ANGELES
165079	HAMID	PM	1100	523923		8332 OSAGE AVE	LOS ANGELES
165079	HAMID	PM	1100	523927		8332 OSAGE AVE	LOS ANGELES
165079	HAMID	PM	1100	513664		8332 OSAGE AVE	LOS ANGELES
165079	HAMID	PM	1100	513663		8332 OSAGE AVE	LOS ANGELES
165079	HAMID	PM10	560	523923		8332 OSAGE AVE	LOS ANGELES
165079	HAMID	PM10	560	523927		8332 OSAGE AVE	LOS ANGELES
165079	HAMID	PM10	560	513664		8332 OSAGE AVE	LOS ANGELES
165079	HAMID	PM10	560	513663		8332 OSAGE AVE	LOS ANGELES
165227	AIRPORT COURTHOUSE, JCC/AOC	NOX	1900.5	514078	I C E (>500 HP) EM ELEC GEN DIESEL	11701 LA CIENEGA BLVD	LOS ANGELES
165231	INGLEWOOD COURTHOUSE, JCC/AOC	NOX	206.5	525986	I C E (50-500 HP) EM FIRE FGHT-DIESEL	1 E REGENT ST	INGLEWOOD
165231	INGLEWOOD COURTHOUSE, JCC/AOC	NOX	864	514083	I C E (>500 HP) EM ELEC GEN DIESEL	1 E REGENT ST	INGLEWOOD
165231	INGLEWOOD COURTHOUSE, JCC/AOC	PM10	49.5	514083	I C E (>500 HP) EM ELEC GEN DIESEL	1 E REGENT ST	INGLEWOOD
166388	DIGITAL 2260 EAST EL SEGUNDO, LLC	NOX	1939.5	517117	I C E (>500 HP) EM ELEC GEN DIESEL	2260 E EL SEGUNDO BLVD	EL SEGUNDO
166388	DIGITAL 2260 EAST EL SEGUNDO, LLC	NOX	1939.5	517118	I C E (>500 HP) EM ELEC GEN DIESEL	2260 E EL SEGUNDO BLVD	EL SEGUNDO
166388	DIGITAL 2260 EAST EL SEGUNDO, LLC	NOX	1939.5	517119	I C E (>500 HP) EM ELEC GEN DIESEL	2260 E EL SEGUNDO BLVD	EL SEGUNDO
166388	DIGITAL 2260 EAST EL SEGUNDO, LLC	NOX	1939.5	517120	I C E (>500 HP) EM ELEC GEN DIESEL	2260 E EL SEGUNDO BLVD	EL SEGUNDO
166388	DIGITAL 2260 EAST EL SEGUNDO, LLC	NOX	1939.5	517121	I C E (>500 HP) EM ELEC GEN DIESEL	2260 E EL SEGUNDO BLVD	EL SEGUNDO
166388	DIGITAL 2260 EAST EL SEGUNDO, LLC	NOX	1939.5	517122	I C E (>500 HP) EM ELEC GEN DIESEL	2260 E EL SEGUNDO BLVD	EL SEGUNDO
166388	DIGITAL 2260 EAST EL SEGUNDO, LLC	NOX	1939.5	517123	I C E (>500 HP) EM ELEC GEN DIESEL	2260 E EL SEGUNDO BLVD	EL SEGUNDO

Table 3.1H-1, cont.

Facility ID	Facility Name	Emittent ID	Emission Amt (lbs/yr)	Appl Nbr	Equipment (BCAT) Description	loc Street Address	loc City
166388	DIGITAL 2260 EAST EL SEGUNDO, LLC	NOX	1939.5	517125	I C E (>500 HP) EM ELEC GEN DIESEL	2260 E EL SEGUNDO BLVD	EL SEGUNDO
166388	DIGITAL 2260 EAST EL SEGUNDO, LLC	NOX	1939.5	517127	I C E (>500 HP) EM ELEC GEN DIESEL	2260 E EL SEGUNDO BLVD	EL SEGUNDO
166388	DIGITAL 2260 EAST EL SEGUNDO, LLC	PM10	32.5	517117	I C E (>500 HP) EM ELEC GEN DIESEL	2260 E EL SEGUNDO BLVD	EL SEGUNDO
166388	DIGITAL 2260 EAST EL SEGUNDO, LLC	PM10	32.5	517118	I C E (>500 HP) EM ELEC GEN DIESEL	2260 E EL SEGUNDO BLVD	EL SEGUNDO
166388	DIGITAL 2260 EAST EL SEGUNDO, LLC	PM10	32.5	517119	I C E (>500 HP) EM ELEC GEN DIESEL	2260 E EL SEGUNDO BLVD	EL SEGUNDO
166388	DIGITAL 2260 EAST EL SEGUNDO, LLC	PM10	32.5	517120	I C E (>500 HP) EM ELEC GEN DIESEL	2260 E EL SEGUNDO BLVD	EL SEGUNDO
166388	DIGITAL 2260 EAST EL SEGUNDO, LLC	PM10	32.5	517121	I C E (>500 HP) EM ELEC GEN DIESEL	2260 E EL SEGUNDO BLVD	EL SEGUNDO
166388	DIGITAL 2260 EAST EL SEGUNDO, LLC	PM10	32.5	517122	I C E (>500 HP) EM ELEC GEN DIESEL	2260 E EL SEGUNDO BLVD	EL SEGUNDO
166388	DIGITAL 2260 EAST EL SEGUNDO, LLC	PM10	32.5	517123	I C E (>500 HP) EM ELEC GEN DIESEL	2260 E EL SEGUNDO BLVD	EL SEGUNDO
166388	DIGITAL 2260 EAST EL SEGUNDO, LLC	PM10	32.5	517125	I C E (>500 HP) EM ELEC GEN DIESEL	2260 E EL SEGUNDO BLVD	EL SEGUNDO
166388	DIGITAL 2260 EAST EL SEGUNDO, LLC	PM10	32.5	517127	I C E (>500 HP) EM ELEC GEN DIESEL	2260 E EL SEGUNDO BLVD	EL SEGUNDO
166607	J & J AUTO BODY SHOP	PM	655.2	518110		14120-24 CRENSHAW BLVD	GARDENA
166607	J & J AUTO BODY SHOP	PM10	343.2	518110		14120-24 CRENSHAW BLVD	GARDENA
166664	EVEN KEEL INDUSTRIES LLC	PM	748.8	519887		922 W HYDE PARK BLVD	INGLEWOOD
166664	EVEN KEEL INDUSTRIES LLC	PM10	374.4	519887		922 W HYDE PARK BLVD	INGLEWOOD
166890	LIVING SPACES - REDONDO BEACH	NOX	60	519046	I C E (50-500 HP) EM ELEC GEN-DIESEL	1519 HAWTHORNE BLVD	REDONDO BEACH
166890	LIVING SPACES - REDONDO BEACH	PM	2.5	519046	I C E (50-500 HP) EM ELEC GEN-DIESEL	1519 HAWTHORNE BLVD	REDONDO BEACH
167007	COOPERSMITH INC	NOX	82.26	519866	I C E (50-500 HP) EM ELEC GEN-DIESEL	525 DOUGLAS ST	EL SEGUNDO
167007	COOPERSMITH INC	PM10	5.09	519866	I C E (50-500 HP) EM ELEC GEN-DIESEL	525 DOUGLAS ST	EL SEGUNDO
167092	EQUITY OFFICE PROPERTIES	NOX	110	519637	I C E (50-500 HP) EM ELEC GEN-DIESEL	6880 PARK TERRACE DR	LOS ANGELES
167092	EQUITY OFFICE PROPERTIES	PM10	12	519637	I C E (50-500 HP) EM ELEC GEN-DIESEL	6880 PARK TERRACE DR	LOS ANGELES
167173	EQUITY OFFICE PROPERTIES, TRIZAC 6100 HH	NOX	501	520020	I C E (50-500 HP) EM ELEC GEN-DIESEL	6100 CENTER DR	LOS ANGELES
167173	EQUITY OFFICE PROPERTIES, TRIZAC 6100 HH	PM	29	520020	I C E (50-500 HP) EM ELEC GEN-DIESEL	6100 CENTER DR	LOS ANGELES
167187	CENTURY 1ST AUTO BODY & PAINT, INC.	PM	832	520087		427 HINDRY	INGLEWOOD
167187	CENTURY 1ST AUTO BODY & PAINT, INC.	PM10	416	520087		427 HINDRY	INGLEWOOD
167389	PRECISION COACHCRAFT	NOX	80	521129		7351 LA TIJERA BLVD	LOS ANGELES
167389	PRECISION COACHCRAFT	PM	1100	521129		7351 LA TIJERA BLVD	LOS ANGELES
167389	PRECISION COACHCRAFT	PM10	560	521129		7351 LA TIJERA BLVD	LOS ANGELES
167598	SPACE EXPLORATION TECHNOLOGIES	NOX	174.72	536460	OVEN, OTHER	1 ROCKET RD	HAWTHORNE
167598	SPACE EXPLORATION TECHNOLOGIES	NOX	436.8	522262	OVEN, PLASTIC/RESIN CURING	1 ROCKET RD	HAWTHORNE
167598	SPACE EXPLORATION TECHNOLOGIES	NOX	611.52	533737		1 ROCKET RD	HAWTHORNE
167598	SPACE EXPLORATION TECHNOLOGIES	NOX	800.8	522261	OVEN, PLASTIC/RESIN CURING	1 ROCKET RD	HAWTHORNE
167598	SPACE EXPLORATION TECHNOLOGIES	NOX	1135.68	529206	OVEN, PLASTIC/RESIN CURING	1 ROCKET RD	HAWTHORNE
167598	SPACE EXPLORATION TECHNOLOGIES	PM	0	536460	OVEN, OTHER	1 ROCKET RD	HAWTHORNE
167598	SPACE EXPLORATION TECHNOLOGIES	PM	698.88	533737		1 ROCKET RD	HAWTHORNE
167598	SPACE EXPLORATION TECHNOLOGIES	PM10	0	536460	OVEN, OTHER	1 ROCKET RD	HAWTHORNE
167598	SPACE EXPLORATION TECHNOLOGIES	PM10	349.44	533737		1 ROCKET RD	HAWTHORNE
167598	SPACE EXPLORATION TECHNOLOGIES	PM10	262.08	529206	OVEN, PLASTIC/RESIN CURING	1 ROCKET RD	HAWTHORNE
167619	CLEAN HARBORS ENVIRONMENTAL SERVICES	NOX	357	522958	BOILER < 2MM BTU/HR OIL-FIRED DIESEL	324 W EL SEGUNDO BLVD	EL SEGUNDO
167619	CLEAN HARBORS ENVIRONMENTAL SERVICES	PM10	35	522958	BOILER < 2MM BTU/HR OIL-FIRED DIESEL	324 W EL SEGUNDO BLVD	EL SEGUNDO
167814	TESLA MOTORS INC	NOX	83.2	522849		3203 JACK NORTHROP AVE	HAWTHORNE
167843	CUSTOM HOTEL LLC	NOX	94	522948	I C E (50-500 HP) EM ELEC GEN-DIESEL	8639 LINCOLN BLVD	LOS ANGELES
167843	CUSTOM HOTEL LLC	PM10	2	522948	I C E (50-500 HP) EM ELEC GEN-DIESEL	8639 LINCOLN BLVD	LOS ANGELES
167899	POWER COLLISION CENTER OF SOUTH BAY	NOX	83.2	523180		707 N SEPULVEDA BLVD	MANHATTAN BEACH
167899	POWER COLLISION CENTER OF SOUTH BAY	NOX	83.2	523181		707 N SEPULVEDA BLVD	MANHATTAN BEACH
167899	POWER COLLISION CENTER OF SOUTH BAY	PM	332.8	523182		707 N SEPULVEDA BLVD	MANHATTAN BEACH
167899	POWER COLLISION CENTER OF SOUTH BAY	PM	332.8	523180		707 N SEPULVEDA BLVD	MANHATTAN BEACH
167899	POWER COLLISION CENTER OF SOUTH BAY	PM	332.8	523181		707 N SEPULVEDA BLVD	MANHATTAN BEACH
167899	POWER COLLISION CENTER OF SOUTH BAY	PM10	166.4	523182		707 N SEPULVEDA BLVD	MANHATTAN BEACH
167899	POWER COLLISION CENTER OF SOUTH BAY	PM10	166.4	523180		707 N SEPULVEDA BLVD	MANHATTAN BEACH
167899	POWER COLLISION CENTER OF SOUTH BAY	PM10	166.4	523181		707 N SEPULVEDA BLVD	MANHATTAN BEACH

Table 3.1H-1, cont.

Facility ID	Facility Name	Emittent ID	Emission Amt (lbs/yr)	Appl Nbr	Equipment (BCAT) Description	loc Street Address	loc City
167921	ASIANA AIRLINES	NOX	1756	525108	I C E (>500 HP) EM ELEC GEN DIESEL	5758 W CENTURY BLVD	LOS ANGELES
167921	ASIANA AIRLINES	PM10	30	525108	I C E (>500 HP) EM ELEC GEN DIESEL	5758 W CENTURY BLVD	LOS ANGELES
168483	CITY OF HAWTHORNE, CA WATER SERVICE CO.	PM10	4.61	528481	STORAGE TANK W/ VAPOR CONTROL AMMONIA	12601 RAMONA AVE	HAWTHORNE
168764	44 LA WESTSIDE LESSEE, LLC	NOX	54.5	527693	I C E (50-500 HP) EM FIRE FGHT-DIESEL	6333 BRISTOL	CULVER CITY
168764	44 LA WESTSIDE LESSEE, LLC	NOX	4.17	527694	I C E (50-500 HP) EM ELEC GEN-DIESEL	6333 BRISTOL	CULVER CITY
168764	44 LA WESTSIDE LESSEE, LLC	PM	0.18	527694	I C E (50-500 HP) EM ELEC GEN-DIESEL	6333 BRISTOL	CULVER CITY
168764	44 LA WESTSIDE LESSEE, LLC	PM10	2.5	527693	I C E (50-500 HP) EM FIRE FGHT-DIESEL	6333 BRISTOL	CULVER CITY
168811	CLOUDBREAK, INGLEWOOD	NOX	49.21	526259	I C E (50-500 HP) EM ELEC GEN-DIESEL	725 HINDRY AVE	INGLEWOOD
168811	CLOUDBREAK, INGLEWOOD	PM10	2.31	526259	I C E (50-500 HP) EM ELEC GEN-DIESEL	725 HINDRY AVE	INGLEWOOD
168886	FIRST CHURCH OF GOD OF LOS ANGELES	NOX	377	527704	I C E (>500 HP) EM ELEC GEN DIESEL	333 N PRAIRIE AVE	INGLEWOOD
168886	FIRST CHURCH OF GOD OF LOS ANGELES	NOX	453	527705	I C E (>500 HP) EM ELEC GEN DIESEL	333 N PRAIRIE AVE	INGLEWOOD
168886	FIRST CHURCH OF GOD OF LOS ANGELES	NOX	3425	527701	BOILER (5-20 MMBTU/HR) COMB GAS-DISTILL	333 N PRAIRIE AVE	INGLEWOOD
168886	FIRST CHURCH OF GOD OF LOS ANGELES	NOX	3425	527702	BOILER (5-20 MMBTU/HR) COMB GAS-DISTILL	333 N PRAIRIE AVE	INGLEWOOD
168886	FIRST CHURCH OF GOD OF LOS ANGELES	NOX	3425	527703	BOILER (5-20 MMBTU/HR) COMB GAS-DISTILL	333 N PRAIRIE AVE	INGLEWOOD
168886	FIRST CHURCH OF GOD OF LOS ANGELES	PM	15	527705	I C E (>500 HP) EM ELEC GEN DIESEL	333 N PRAIRIE AVE	INGLEWOOD
168886	FIRST CHURCH OF GOD OF LOS ANGELES	PM10	8	527704	I C E (>500 HP) EM ELEC GEN DIESEL	333 N PRAIRIE AVE	INGLEWOOD
168886	FIRST CHURCH OF GOD OF LOS ANGELES	PM10	683	527701	BOILER (5-20 MMBTU/HR) COMB GAS-DISTILL	333 N PRAIRIE AVE	INGLEWOOD
168886	FIRST CHURCH OF GOD OF LOS ANGELES	PM10	683	527702	BOILER (5-20 MMBTU/HR) COMB GAS-DISTILL	333 N PRAIRIE AVE	INGLEWOOD
168886	FIRST CHURCH OF GOD OF LOS ANGELES	PM10	683	527703	BOILER (5-20 MMBTU/HR) COMB GAS-DISTILL	333 N PRAIRIE AVE	INGLEWOOD
168983	MARINA CARE CENTER	NOX	36.5	526835	I C E (50-500 HP) EM ELEC GEN-DIESEL	5240 SEPULVEDA BLVD	CULVER CITY
168983	MARINA CARE CENTER	PM	3	526835	I C E (50-500 HP) EM ELEC GEN-DIESEL	5240 SEPULVEDA BLVD	CULVER CITY
168983	MARINA CARE CENTER	PM10	3	526835	I C E (50-500 HP) EM ELEC GEN-DIESEL	5240 SEPULVEDA BLVD	CULVER CITY
169168	T5@ LOS ANGELES, LLC	NOX	244.5	527576	I C E (>500 HP) EM ELEC GEN DIESEL	444 N NASH ST	EL SEGUNDO
169168	T5@ LOS ANGELES, LLC	NOX	1481.5	527568	I C E (>500 HP) EM ELEC GEN DIESEL	444 N NASH ST	EL SEGUNDO
169168	T5@ LOS ANGELES, LLC	NOX	1481.5	527569	I C E (>500 HP) EM ELEC GEN DIESEL	444 N NASH ST	EL SEGUNDO
169168	T5@ LOS ANGELES, LLC	NOX	1481.5	527570	I C E (>500 HP) EM ELEC GEN DIESEL	444 N NASH ST	EL SEGUNDO
169168	T5@ LOS ANGELES, LLC	NOX	1481.5	527571	I C E (>500 HP) EM ELEC GEN DIESEL	444 N NASH ST	EL SEGUNDO
169168	T5@ LOS ANGELES, LLC	NOX	1481.5	527572	I C E (>500 HP) EM ELEC GEN DIESEL	444 N NASH ST	EL SEGUNDO
169168	T5@ LOS ANGELES, LLC	NOX	1481.5	527574	I C E (>500 HP) EM ELEC GEN DIESEL	444 N NASH ST	EL SEGUNDO
169168	T5@ LOS ANGELES, LLC	NOX	1481.5	527575	I C E (>500 HP) EM ELEC GEN DIESEL	444 N NASH ST	EL SEGUNDO
169168	T5@ LOS ANGELES, LLC	NOX	1481.5	527577	I C E (>500 HP) EM ELEC GEN DIESEL	444 N NASH ST	EL SEGUNDO
169168	T5@ LOS ANGELES, LLC	PM10	8	527576	I C E (>500 HP) EM ELEC GEN DIESEL	444 N NASH ST	EL SEGUNDO
169168	T5@ LOS ANGELES, LLC	PM10	19	527568	I C E (>500 HP) EM ELEC GEN DIESEL	444 N NASH ST	EL SEGUNDO
169168	T5@ LOS ANGELES, LLC	PM10	19	527569	I C E (>500 HP) EM ELEC GEN DIESEL	444 N NASH ST	EL SEGUNDO
169168	T5@ LOS ANGELES, LLC	PM10	19	527570	I C E (>500 HP) EM ELEC GEN DIESEL	444 N NASH ST	EL SEGUNDO
169168	T5@ LOS ANGELES, LLC	PM10	19	527571	I C E (>500 HP) EM ELEC GEN DIESEL	444 N NASH ST	EL SEGUNDO
169168	T5@ LOS ANGELES, LLC	PM10	19	527572	I C E (>500 HP) EM ELEC GEN DIESEL	444 N NASH ST	EL SEGUNDO
169168	T5@ LOS ANGELES, LLC	PM10	19	527574	I C E (>500 HP) EM ELEC GEN DIESEL	444 N NASH ST	EL SEGUNDO
169168	T5@ LOS ANGELES, LLC	PM10	19	527575	I C E (>500 HP) EM ELEC GEN DIESEL	444 N NASH ST	EL SEGUNDO
169168	T5@ LOS ANGELES, LLC	PM10	19	527577	I C E (>500 HP) EM ELEC GEN DIESEL	444 N NASH ST	EL SEGUNDO
169247	INTERNAP REDONDO BEACH	NOX	1348	527985	I C E (>500 HP) EM ELEC GEN DIESEL	3690 REDONDO BEACH AVE	REDONDO BEACH
169247	INTERNAP REDONDO BEACH	NOX	1348	528075	I C E (>500 HP) EM ELEC GEN DIESEL	3690 REDONDO BEACH AVE	REDONDO BEACH
169247	INTERNAP REDONDO BEACH	PM	40.5	527985	I C E (>500 HP) EM ELEC GEN DIESEL	3690 REDONDO BEACH AVE	REDONDO BEACH
169247	INTERNAP REDONDO BEACH	PM	40.5	528075	I C E (>500 HP) EM ELEC GEN DIESEL	3690 REDONDO BEACH AVE	REDONDO BEACH
169249	UDR MARINA POINTE LLC, MARINA POINTE	NOX	87	527946	I C E (50-500 HP) EM ELEC GEN-DIESEL	13603 MARINA POINTE DR	MARINA DEL REY
169249	UDR MARINA POINTE LLC, MARINA POINTE	PM10	1	527946	I C E (50-500 HP) EM ELEC GEN-DIESEL	13603 MARINA POINTE DR	MARINA DEL REY
169382	HANKEY INVESTMENT	NOX	701.5	529323	I C E (>500 HP) EM ELEC GEN DIESEL	4503 GLENCOE AVE	MARINA DEL REY
169382	HANKEY INVESTMENT	NOX	1266	529324	I C E (50-500 HP) EM ELEC GEN-DIESEL	4503 GLENCOE AVE	MARINA DEL REY
169382	HANKEY INVESTMENT	PM10	7.5	529323	I C E (>500 HP) EM ELEC GEN DIESEL	4503 GLENCOE AVE	MARINA DEL REY
169382	HANKEY INVESTMENT	PM10	20	529324	I C E (50-500 HP) EM ELEC GEN-DIESEL	4503 GLENCOE AVE	MARINA DEL REY
169616	URS CORPORATION	NOX	1397.76	528801	SOIL TREAT VAPOR EXTRACT GASOLINE UNDER	3971 W ARTESIA BLVD	TORRANCE

Table 3.1H-1, cont.

Facility ID	Facility Name	Emittent ID	Emission Amt (lbs/yr)	Appl Nbr	Equipment (BCAT) Description	loc Street Address	loc City
169616	URS CORPORATION	PM10	87.36	528801	SOIL TREAT VAPOR EXTRACT GASOLINE UNDER	3971 W ARTESIA BLVD	TORRANCE
169618	TWC, INC.	NOX	1079	528952	I C E (>500 HP) EM ELEC GEN DIESEL	2345 ALASKA AVE	EL SEGUNDO
169618	TWC, INC.	PM10	14	528952	I C E (>500 HP) EM ELEC GEN DIESEL	2345 ALASKA AVE	EL SEGUNDO
169711	PACIFIC-BIO MATERIAL MANAGEMENT, INC	NOX	65.88	529068	I C E (50-500 HP) EM ELEC GEN-DIESEL	121 SHELDON ST	EL SEGUNDO
169711	PACIFIC-BIO MATERIAL MANAGEMENT, INC	PM10	3.66	529068	I C E (50-500 HP) EM ELEC GEN-DIESEL	121 SHELDON ST	EL SEGUNDO
169732	MERCURY GSE RON SPIEGEL	PM	1123.2	529166		12519 CERISE AVE	HAWTHORNE
169732	MERCURY GSE RON SPIEGEL	PM10	561.6	529166		12519 CERISE AVE	HAWTHORNE
169795	AUTO BODY PROS, INC	PM	1100	529300		523 S HINDRY	INGLEWOOD
169795	AUTO BODY PROS, INC	PM10	560	529300		523 S HINDRY	INGLEWOOD
169902	MARINA BUSINESS CENTER LLC	NOX	1287.6	529669	I C E (>500 HP) EM ELEC GEN DIESEL	4505 GLENCOE AVE	MARINA DEL REY
169902	MARINA BUSINESS CENTER LLC	NOX	1332.3	529670	I C E (>500 HP) EM ELEC GEN DIESEL	4505 GLENCOE AVE	MARINA DEL REY
169902	MARINA BUSINESS CENTER LLC	NOX	1332.3	529671	I C E (>500 HP) EM ELEC GEN DIESEL	4505 GLENCOE AVE	MARINA DEL REY
169902	MARINA BUSINESS CENTER LLC	PM10	69.6	529669	I C E (>500 HP) EM ELEC GEN DIESEL	4505 GLENCOE AVE	MARINA DEL REY
169902	MARINA BUSINESS CENTER LLC	PM10	74.1	529670	I C E (>500 HP) EM ELEC GEN DIESEL	4505 GLENCOE AVE	MARINA DEL REY
169902	MARINA BUSINESS CENTER LLC	PM10	74.1	529671	I C E (>500 HP) EM ELEC GEN DIESEL	4505 GLENCOE AVE	MARINA DEL REY
170227	QUANTIMETRIX CORPORATION	NOX	25.5	531128	I C E (50-500 HP) EM ELEC GEN-DIESEL	2005 MANHATTAN BEACH BLVD	REDONDO BEACH
170227	QUANTIMETRIX CORPORATION	PM10	1.5	531128	I C E (50-500 HP) EM ELEC GEN-DIESEL	2005 MANHATTAN BEACH BLVD	REDONDO BEACH
170570	STAMPS.COM, INC.	NOX	576.11	532499	I C E (>500 HP) EM ELEC GEN DIESEL	1990 E GRAND AVE	EL SEGUNDO
170570	STAMPS.COM, INC.	PM10	13.17	532499	I C E (>500 HP) EM ELEC GEN DIESEL	1990 E GRAND AVE	EL SEGUNDO
171160	AEG DIGITAL MEDIA LLC	NOX	372.6	535722	I C E (>500 HP) EM ELEC GEN-OIL	12950 CULVER BLVD SUITE 200	LOS ANGELES
171160	AEG DIGITAL MEDIA LLC	PM10	17.1	535722	I C E (>500 HP) EM ELEC GEN-OIL	12950 CULVER BLVD SUITE 200	LOS ANGELES
171246	CIRCLE K STORES INC.	NOX	611.52	536037	SOIL TREAT VAPOR EXTRACT GASOLINE UNDER	8307 S LA CIENEGA BLVD	INGLEWOOD
171246	CIRCLE K STORES INC.	PM10	0	536037	SOIL TREAT VAPOR EXTRACT GASOLINE UNDER	8307 S LA CIENEGA BLVD	INGLEWOOD
171976	CALIBER COLLISION CENTER	NOX	208	540828		737 N LA BREA AVE	INGLEWOOD
171976	CALIBER COLLISION CENTER	NOX	228.8	540829		737 N LA BREA AVE	INGLEWOOD
171976	CALIBER COLLISION CENTER	NOX	228.8	540830		737 N LA BREA AVE	INGLEWOOD
171976	CALIBER COLLISION CENTER	PM	1019.2	540048		737 N LA BREA AVE	INGLEWOOD
171976	CALIBER COLLISION CENTER	PM	1019.2	540049		737 N LA BREA AVE	INGLEWOOD
171976	CALIBER COLLISION CENTER	PM10	499.2	540048		737 N LA BREA AVE	INGLEWOOD
171976	CALIBER COLLISION CENTER	PM10	499.2	540049		737 N LA BREA AVE	INGLEWOOD
171976	CALIBER COLLISION CENTER	PM10	20.8	540828		737 N LA BREA AVE	INGLEWOOD
171985	ORCHARD SUPPLY HARDWARE	NOX	63.13	540077	I C E (50-500 HP) EM ELEC GEN-DIESEL	19330 HAWTHORNE BLVD	TORRANCE
171985	ORCHARD SUPPLY HARDWARE	PM10	1.99	540077	I C E (50-500 HP) EM ELEC GEN-DIESEL	19330 HAWTHORNE BLVD	TORRANCE
172056	LAX AUTO BODY, INC.	PM	1019.2	540481		3348 W EL SEGUNDO BLVD	HAWTHORNE
172056	LAX AUTO BODY, INC.	PM	1019.2	540486		3348 W EL SEGUNDO BLVD	HAWTHORNE
172056	LAX AUTO BODY, INC.	PM10	499.2	540481		3348 W EL SEGUNDO BLVD	HAWTHORNE
172056	LAX AUTO BODY, INC.	PM10	499.2	540486		3348 W EL SEGUNDO BLVD	HAWTHORNE
172230	DTV	NOX	589	541122	I C E (>500 HP) EM ELEC GEN DIESEL	2260 E IMPERIAL HWY	EL SEGUNDO
172230	DTV	PM10	2	541122	I C E (>500 HP) EM ELEC GEN DIESEL	2260 E IMPERIAL HWY	EL SEGUNDO
172294	EUROTECH USA	PM10	561.6	541546		3940 W EL SEGUNDO BLVD	HAWTHORNE
172907	GROS INVESTMENTS LOS ANGELES PROPERTIES	NOX	103	544240	I C E (50-500 HP) EM ELEC GEN-DIESEL	5521 GROSEVENOR BLVD	LOS ANGELES
172907	GROS INVESTMENTS LOS ANGELES PROPERTIES	PM10	3	544240	I C E (50-500 HP) EM ELEC GEN-DIESEL	5521 GROSEVENOR BLVD	LOS ANGELES
172992	USDA - APHIS	NOX	132.5	544741	I C E (50-500 HP) EM ELEC GEN-DIESEL	222 KANSAS ST	EL SEGUNDO
172992	USDA - APHIS	PM10	4.5	544741	I C E (50-500 HP) EM ELEC GEN-DIESEL	222 KANSAS ST	EL SEGUNDO
800030	CHEVRON PRODUCTS CO.	NOX	0	479168		324 W EL SEGUNDO BLVD	EL SEGUNDO
800030	CHEVRON PRODUCTS CO.	NOX	262.08	302807	SOIL TREAT VAPOR EXTRACT GASOLINE UNDER	324 W EL SEGUNDO BLVD	EL SEGUNDO
800030	CHEVRON PRODUCTS CO.	NOX	2467	526609		324 W EL SEGUNDO BLVD	EL SEGUNDO
800030	CHEVRON PRODUCTS CO.	NOX	35555.52	527112	HEATER/FURNACE (>50 MMBTU/HR) PROC GAS	324 W EL SEGUNDO BLVD	EL SEGUNDO
800030	CHEVRON PRODUCTS CO.	NOX	48921.6	445727	HEATER/FURNACE (>50 MMBTU/HR)PROCESS GAS	324 W EL SEGUNDO BLVD	EL SEGUNDO
800030	CHEVRON PRODUCTS CO.	NOX	51717.12	345241	HEATER/FURNACE (>50 MMBTU/HR)PROCESS GAS	324 W EL SEGUNDO BLVD	EL SEGUNDO
800030	CHEVRON PRODUCTS CO.	NOX	53813.76	445728	HEATER/FURNACE (>50 MMBTU/HR)PROCESS GAS	324 W EL SEGUNDO BLVD	EL SEGUNDO

Table 3.1H-1, cont.

Facility ID	Facility Name	Emittent ID	Emission Amt (lbs/yr)	Appl Nbr	Equipment (BCAT) Description	loc Street Address	loc City
800030	CHEVRON PRODUCTS CO.	NOX	69975.36	526607	TURBINE ENGINE (<=50 MW) NAT & PROC GAS	324 W EL SEGUNDO BLVD	EL SEGUNDO
800030	CHEVRON PRODUCTS CO.	NOX	13228.17	521770		324 W EL SEGUNDO BLVD	EL SEGUNDO
800030	CHEVRON PRODUCTS CO.	NOX	127807.68	345242	HEATER/FURNACE (>50 MMBTU/HR)PROCESS GAS	324 W EL SEGUNDO BLVD	EL SEGUNDO
800030	CHEVRON PRODUCTS CO.	NOX	577711.68	513694	FLUID CATALYTIC CRACKING EQUIPMENT	324 W EL SEGUNDO BLVD	EL SEGUNDO
800030	CHEVRON PRODUCTS CO.	PM	15	302807	SOIL TREAT VAPOR EXTRACT GASOLINE UNDER	324 W EL SEGUNDO BLVD	EL SEGUNDO
800030	CHEVRON PRODUCTS CO.	PM	34419.84	345241	HEATER/FURNACE (>50 MMBTU/HR)PROCESS GAS	324 W EL SEGUNDO BLVD	EL SEGUNDO
800030	CHEVRON PRODUCTS CO.	PM	57133.44	345242	HEATER/FURNACE (>50 MMBTU/HR)PROCESS GAS	324 W EL SEGUNDO BLVD	EL SEGUNDO
800030	CHEVRON PRODUCTS CO.	PM10	285	388733	DELAYED COKING UNIT	324 W EL SEGUNDO BLVD	EL SEGUNDO
800030	CHEVRON PRODUCTS CO.	PM10	285	527431	DELAYED COKING UNIT	324 W EL SEGUNDO BLVD	EL SEGUNDO
800030	CHEVRON PRODUCTS CO.	PM10	142	526609		324 W EL SEGUNDO BLVD	EL SEGUNDO
800030	CHEVRON PRODUCTS CO.	PM10	42806.4	527112	HEATER/FURNACE (>50 MMBTU/HR) PROC GAS	324 W EL SEGUNDO BLVD	EL SEGUNDO
800030	CHEVRON PRODUCTS CO.	PM10	10657.92	445727	HEATER/FURNACE (>50 MMBTU/HR)PROCESS GAS	324 W EL SEGUNDO BLVD	EL SEGUNDO
800030	CHEVRON PRODUCTS CO.	PM10	11706.24	445728	HEATER/FURNACE (>50 MMBTU/HR)PROCESS GAS	324 W EL SEGUNDO BLVD	EL SEGUNDO
800030	CHEVRON PRODUCTS CO.	PM10	0	526607	TURBINE ENGINE (<=50 MW) NAT & PROC GAS	324 W EL SEGUNDO BLVD	EL SEGUNDO
800030	CHEVRON PRODUCTS CO.	PM10	128.06	521770		324 W EL SEGUNDO BLVD	EL SEGUNDO
800030	CHEVRON PRODUCTS CO.	PM10	94348.8	513694	FLUID CATALYTIC CRACKING EQUIPMENT	324 W EL SEGUNDO BLVD	EL SEGUNDO
800196	AMERICAN AIRLINES INC (EIS USE)	NOX	1520	539710	I C E (>500 HP) EM ELEC GEN DIESEL	7260 WORLD WAY WEST	LOS ANGELES
800196	AMERICAN AIRLINES INC (EIS USE)	PM10	9	539710	I C E (>500 HP) EM ELEC GEN DIESEL	7260 WORLD WAY WEST	LOS ANGELES

Table 3.1H-2
Basis for Excluding Permit Applications from Cumulative Impact Analysis

Plant	Facility Name	Source Description	Basis for exclusion
4735	REDONDO BEACH CITY	I C E (>500 HP) EM ELEC GEN DIESEL	Emissions < 5 TPY
5259	NEUTROGENA CORP	PLASTIC/RESIN SIZE REDUCTION	Emissions < 5 TPY
8582	SO CAL GAS CO/PLAYA DEL REY STORAGE FACI	I C E (>500 HP) N-EM STAT NAT GAS ONLY	Emergency Engines
8648	MERLE NORMAN COSMETICS INC		Emissions < 5 TPY
9755	UNITED AIRLINES INC	I C E (50-500 HP) EM FIRE FGHT-DIESEL	Emissions < 5 TPY
10292	THE AEROSPACE CORP UNIT NO.02	BOILER (<5 MMBTU/HR) NAT GAS ONLY	Emissions < 5 TPY
13844	CHROMPLATE COMPANY		Emissions < 5 TPY
15660	QUALITY EQUIP RENTALS	SPACE HEATER,PORTABLE,<600,000BTU/HR,DIESEL/OIL FIRED	Emissions < 5 TPY
18294	NORTHROP GRUMMAN CORP, AIRCRAFT DIV	BOILER (5-20 MMBTU/HR) NAT GAS ONLY	Emissions < 5 TPY
20421	BLUE DIAMOND INGLEWOOD ASPHALT CORP	ASPHALT BLENDING/BATCHING EQUIPMENT	Emissions < 5 TPY
22312	LA AIRPORT MARRIOTT HOTEL	BOILER (5-20 MMBTU/HR) NAT GAS ONLY	Emissions < 5 TPY
42278	THE AEROSPACE CORP, UNIT NO.04	I C E (50-500 HP) EM ELEC GEN-DIESEL	Emissions < 5 TPY
44012	GOODMAN FOOD PROD INC	OVEN, COOKING OR CURING	Emissions < 5 TPY
48634	HAWTHORNE HOSPITAL	I C E (50-500 HP) EM ELEC GEN-DIESEL	Emissions < 5 TPY
74693	FEDERAL EXPRESS, LAX OPERATIONS		Emissions < 5 TPY
89127	TRI-STAR ELECTRONICS INTERNATIONAL INC		Emissions < 5 TPY
94065	WEST BASIN MUNICIPAL WATER DISTRICT	STORAGE SILO LIME & LIMESTONE	Emissions < 5 TPY
101140	JIM & JACK INC		Emissions < 5 TPY
104664	ICC COLLISION CENTERS		Emissions < 5 TPY
106674	CITY OF CULVER CITY, BRADDOCK LIFT STATI	I C E (50-500 HP) EM ELEC GEN-DIESEL	Emissions < 5 TPY
114997	RAYTHEON COMPANY	I C E (50-500 HP) EM ELEC GEN-DIESEL	Emissions < 5 TPY
115536	AES REDONDO BEACH, LLC	BOILER (< 2 mmBTU/HR) OIL FIRED	Emissions < 5 TPY
115663	EL SEGUNDO POWER, LLC		Emissions < 5 TPY
135425	SHERATON GATEWAY HOTEL- LAX	BOILER (5-20 MMBTU/HR) NAT GAS ONLY	Emissions < 5 TPY
145747	CROWNE PLAZA HOTEL	CHARBROILER - NATURAL GAS	Emissions < 5 TPY
145836	AMERICAN APPAREL DYEING & FINISHING, INC		Emissions < 5 TPY
148236	AIR LIQUIDE LARGE INDUSTRIES U.S., LP	HYDROGEN PRODUCTION PLANT	Emission increase < 5 TPY
148822	CHEVRON CORPORATION	SOIL TREAT VAPOR EXTRACT GASOLINE UNDER	Emissions < 5 TPY
151346	CALIFORNIA PORTLAND CEMENT CO		Emissions < 5 TPY
154034	CENTINELA HOSPITAL MEDICAL CENTER	I C E (>500 HP) EM ELEC GEN DIESEL	Emissions < 5 TPY
155828	GARRETT AVN. SVCS. LLC DBA STANDARD AERO	JET ENGINE TEST FACILITY OTHER FUEL	Emission increase < 5 TPY

Table 3.1H-2, cont.

Plant	Facility Name	Source Description	Basis for exclusion
157262	EQUINIX OPERATING CO INC	I C E (>500 HP) EM ELEC GEN DIESEL	Emissions < 5 TPY
159183	ATC GROUP SERVICES, INC.	SOIL TREAT VAPOR EXTRACT GASOLINE UNDER	Emissions < 5 TPY
159714	NANOH20		Emissions < 5 TPY
159986	FREEMAN MEDICAL BUILDING, LLC	I C E (>500 HP) EM ELEC GEN DIESEL	Emissions < 5 TPY
161395	ONE PERFECT LINE, LLC DBA SUPERBA COFFEE	Coffee Roasting (50-90 lb capacity)	Emissions < 5 TPY
163088	ARKEMA INC.	BOILER (5-20 MMBTU/HR) NAT GAS ONLY	Emissions < 5 TPY
165079	HAMID		Emissions < 5 TPY
165227	AIRPORT COURTHOUSE, JCC/AOC	I C E (>500 HP) EM ELEC GEN DIESEL	Emissions < 5 TPY
165231	INGLEWOOD COURTHOUSE, JCC/AOC	I C E (50-500 HP) EM FIRE FGHT-DIESEL	Emissions < 5 TPY
166388	DIGITAL 2260 EAST EL SEGUNDO, LLC	I C E (>500 HP) EM ELEC GEN DIESEL	Emissions < 5 TPY
166607	J & J AUTO BODY SHOP		Emissions < 5 TPY
166664	EVEN KEEL INDUSTRIES LLC		Emissions < 5 TPY
166890	LIVING SPACES - REDONDO BEACH	I C E (50-500 HP) EM ELEC GEN-DIESEL	Emissions < 5 TPY
167007	COOPERSMITH INC	I C E (50-500 HP) EM ELEC GEN-DIESEL	Emissions < 5 TPY
167092	EQUITY OFFICE PROPERTIES	I C E (50-500 HP) EM ELEC GEN-DIESEL	Emissions < 5 TPY
167187	CENTURY 1ST AUTO BODY & PAINT, INC.		Emissions < 5 TPY
167389	PRECISION COACHCRAFT		Emissions < 5 TPY
167598	SPACE EXPLORATION TECHNOLOGIES	OVEN, OTHER	Emissions < 5 TPY
167619	CLEAN HARBORS ENVIRONMENTAL SERVICES	BOILER < 2MM BTU/HR OIL-FIRED DIESEL	Emissions < 5 TPY
167814	TESLA MOTORS INC		Emissions < 5 TPY
167843	CUSTOM HOTEL LLC	I C E (50-500 HP) EM ELEC GEN-DIESEL	Emissions < 5 TPY
167899	POWER COLLISION CENTER OF SOUTH BAY		Emissions < 5 TPY
167899	POWER COLLISION CENTER OF SOUTH BAY		Emissions < 5 TPY
167921	ASIANA AIRLINES	I C E (>500 HP) EM ELEC GEN DIESEL	Emissions < 5 TPY
168483	CITY OF HAWTHORNE, CA WATER SERVICE CO.	STORAGE TANK W/ VAPOR CONTROL AMMONIA	Emissions < 5 TPY
168764	44 LA WESTSIDE LESSEE, LLC	I C E (50-500 HP) EM FIRE FGHT-DIESEL	Emissions < 5 TPY
168811	CLOUDBREAK, INGLEWOOD	I C E (50-500 HP) EM ELEC GEN-DIESEL	Emissions < 5 TPY
168886	FIRST CHURCH OF GOD OF LOS ANGELES	I C E (>500 HP) EM ELEC GEN DIESEL	Change of Operator
168983	MARINA CARE CENTER	I C E (50-500 HP) EM ELEC GEN-DIESEL	Emissions < 5 TPY
169168	T5@ LOS ANGELES, LLC	I C E (>500 HP) EM ELEC GEN DIESEL	Emergency Engine
169247	INTERNAP REDONDO BEACH	I C E (>500 HP) EM ELEC GEN DIESEL	Emissions < 5 TPY
169249	UDR MARINA POINTE LLC, MARINA POINTE	I C E (50-500 HP) EM ELEC GEN-DIESEL	Emissions < 5 TPY
169382	HANKEY INVESTMENT	I C E (50-500 HP) EM ELEC GEN-DIESEL	Emissions < 5 TPY

Table 3.1H-2, cont.

Plant	Facility Name	Source Description	Basis for exclusion
169616	URS CORPORATION	SOIL TREAT VAPOR EXTRACT GASOLINE UNDER	Emissions < 5 TPY
169618	TWC, INC.	I C E (>500 HP) EM ELEC GEN DIESEL	Emissions < 5 TPY
169711	PACIFIC-BIO MATERIAL MANAGEMENT, INC	I C E (50-500 HP) EM ELEC GEN-DIESEL	Emissions < 5 TPY
169732	MERCURY GSE RON SPIEGEL		Emissions < 5 TPY
169795	AUTO BODY PROS, INC		Emissions < 5 TPY
169902	MARINA BUSINESS CENTER LLC	I C E (>500 HP) EM ELEC GEN DIESEL	Emissions < 5 TPY
170227	QUANTIMETRIX CORPORATION	I C E (50-500 HP) EM ELEC GEN-DIESEL	Emissions < 5 TPY
170570	STAMPS.COM, INC.	I C E (>500 HP) EM ELEC GEN DIESEL	Emissions < 5 TPY
171160	AEG DIGITAL MEDIA LLC	I C E (>500 HP) EM ELEC GEN-OIL	Emissions < 5 TPY
171246	CIRCLE K STORES INC.	SOIL TREAT VAPOR EXTRACT GASOLINE UNDER	Emissions < 5 TPY
171985	ORCHARD SUPPLY HARDWARE	I C E (50-500 HP) EM ELEC GEN-DIESEL	Emissions < 5 TPY
172056	LAX AUTO BODY, INC.		Emissions < 5 TPY
172230	DTV	I C E (>500 HP) EM ELEC GEN DIESEL	Emissions < 5 TPY
172294	EUROTECH USA		Emissions < 5 TPY
172907	GROS INVESTMENTS LOS ANGELES PROPERTIES	I C E (50-500 HP) EM ELEC GEN-DIESEL	Emissions < 5 TPY
172992	USDA - APHIS	I C E (50-500 HP) EM ELEC GEN-DIESEL	Emissions < 5 TPY
800030	CHEVRON PRODUCTS CO.		Emission increase < 5 TPY
800196	AMERICAN AIRLINES INC (EIS USE)	I C E (>500 HP) EM ELEC GEN DIESEL	Emissions < 5 TPY

Appendix 3.8A
Public Health Calculations and Support Data